STEPPERONLINE®

Full User Manual
EV200 Series
Variable Frequency Drive

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Content

EV200 series high-performance small inverters are the company's new generation of high-quality, high-reliability small inverters. Based on the market demand of low power, small size and simple speed regulation, single-phase 220VAC and three- phase 380VAC small inverters have been launched. It can be widely used in small automated machinery represented by wood carving, glass edging, food filling, medical centrifuges, automated production lines, electronic equipment, logistics equipment, textiles, etc.

Product features:

New narrow body design, compact structure layout, smart design, relative to the old product, the installation size is reduced by 30%, and the volume is reduced by 45%, which is more conducive to saving installation space and reducing power distribution costs;

Independent air ducts, straight up and down, efficient heat dissipation; can be installed side by side, reasonable use of installation space, greatly reducing the cost of power distribution cabinets;

0.5Hz starting torque can reach 150%;

0.75-2.2kW without built-in braking unit, above 3.7kW with braking unit;

4 digital input terminals, 1 analog input, 1 relay output;

The keyboard can be imported, compatible with the company's 510A, 510H inverter keyboard interface.

1.Nameplate specification

2. Model specification

EV200 - 0750G - T3	
Product series	Voltage level: S2：Single-phase 220V T3：three-phase 380V
Power code： 0750：0.75kW G：General	

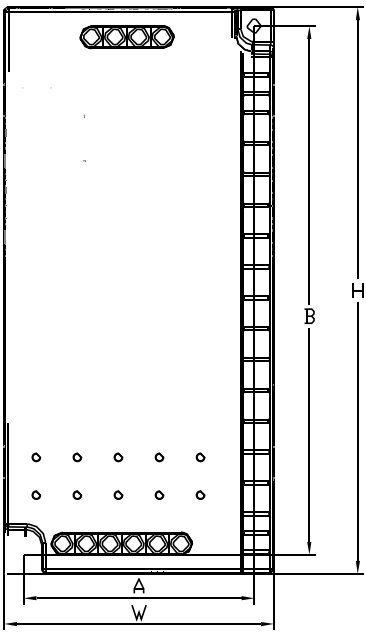
Model type	Power KVA	Input current A	Output current A	Matched motor kW
EV200-0400G-S2	1.0	5.4	2.3	0.4
EV200-0750G-S2	1.5	8.2	4.0	0.75
EV200-1500G-S2	3.0	14.0	7.0	1.5
EV200-2200G-S2	4.0	23.0	9.6	2.2
EV200-0750G-T3	1.5	3.4	2.1	0.75
EV200-1500G-T3	3.0	5.0	3.8	1.5
EV200-2200G-T3	4.0	5.8	5.1	2.2
EV200-3700G-T3	5.9	10.5	9.0	3.7
EV200-5500G-T3	8.9	14.6	13.0	5.5

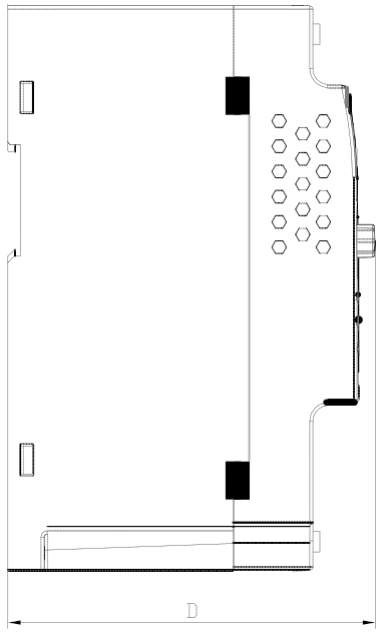
3.Technical data

Item		Specification	
Basic function	Highest frequency	Vector control: 0～500Hz; V/F control: 0～500Hz	
	Carrier frequency	0.8kHz ～ 12kHz Carrier frequency can be adjusted automatically according to temperature characteristics	
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency × 0.025%	
	control mode	without PG Vector(SVC),Feedback vector(FVC) and V/F control	
	Start torque	G type: 0.5Hz/150%（SVC）：0Hz/180%（FVC） P type: 0.5Hz/100%	
	Speed range	1：100（SVC）	1：1000（FVC）
	Speed control accuracy	±0.5%（SVC）	±0.02%（FVC）
	Torque control accuracy	±5%（FVC）	
	Overload capacity	G type: 150% rated current 60sec; 180% rated current 3sec P type: 120% rated current 60sec; 150% rated current 3sec	
	Toruqe boost	Auto-torque boost;manual torque boost 0.1%~30.0%	
	V/F curve	Three types:linear type; multi-point type; the nth power of V/F curve	
	V/F Seperation	Two types:full seperation, half seperation	
	ACC/DEC curve	Linear or S curve of ACC/DEC ways.Four types of ACC/DEC Time, ACC/DEC time range is 0.0~6500.0s	
	DC brake	DC brake frequency: 0.00Hz~ max frequency,brake time: 0.0s~36.0s,brake action current: 0.0%~100.0%	
	JOG Control	JOG frequency range: 0.00Hz~50.00Hz.JOG speed-up/down time: 0.0s~6500.0.	
	Simple PLC,multi-stage speed running	Via built-in PLC or control terminal can realize max 16 stage speed running	
	Built-in PID	Can realize process control close-loop system conveniently	
	Auto-adjust voltage(AVR)	When grid voltage changes,can keep output voltage steadily automatically	
	Over current and over voltage speed control	During running,limit current and voltage automatically,protect from tripping off frequently for over voltage and over current.	
	Quick current-limit function	Reduce over current error on max extent,protect inverter normal running	
	Torque limitation and control	“digger”feature, inverter could limit torque automatically,prevent over current tripping off;close- loop vector can realize torque control.	
	Outstanding perform	Using high-perform current vector control	
	Instantaneous stop not stop	during instant power-off, by motor feedback energy,inverter compensates voltage-drop to keep	
		running for short time.	
Personable function	Quick current-limit function	Reduce over current error on max extent	

	Timing control	timing control function: setting time range: 0.0min~6500.0min
	Multi-motor switch	2sets of motor parameter, can realize 2motors switching control
	Multi threading bus support Multi threading bus support	Support multiple fieldbus: Modbus, RS85
	Multi-encoder support	Support differential, open collector, rotary transformer
	Command source	control panel, control terminal, communication; can be switched by several modes
	Frequency source	10 types of frequency sources: digital setting, analog voltage setting, analog current setting, pulse setting, communication setting, can be switched by several methods
	Auxiliary frequency sources	10 types of auxiliary frequency source, can realize auxiliary frequency trimming, frequency combining flexiably
Running display and keypad	Input terminal	Standard: 7 digital input terminal, one of them support max 100KHz HS pulse input; 2 analog input terminal, one of them support 2 support 0~10V voltage input,one support 0~10V voltage or 0~20mA current input.
	Output terminal	Standard: 1 high-speed pulse output terminal(optional open collector),support 0~100kHzpulse 1 digit output terminals； 2 relay output terminal 2 analog output terminals,one of them support 0~20mA current output;
	LED display	Can display parameter
	Press-key locking and function selection	Realize press-key partial or full locking, define partal press-key function range, to avoid wrong operation
	Protection function	Power-on motor short circuit test,output phase-loss protection, over-current protection, over-voltage protection, under-voltage protection, overheat protection, overload protection etc.
	Optional parts	Differential PG card, open collector PG card,rotary transformer PG card
Environment	Application site	Indoor, without direct sunlight, no powder, corrosive gas, combustion air, oil dust, water steam, water drop or salt etc.
	Altitude level	Less than 1000m
	Environment temperature	－10℃~＋40℃（During 40℃~50℃，please reduce capacity t ouse）
	Humidity	<95%RH, no water drop condensed
Opitional	Two Panel LED display	LED display;using RJ45 port to connect

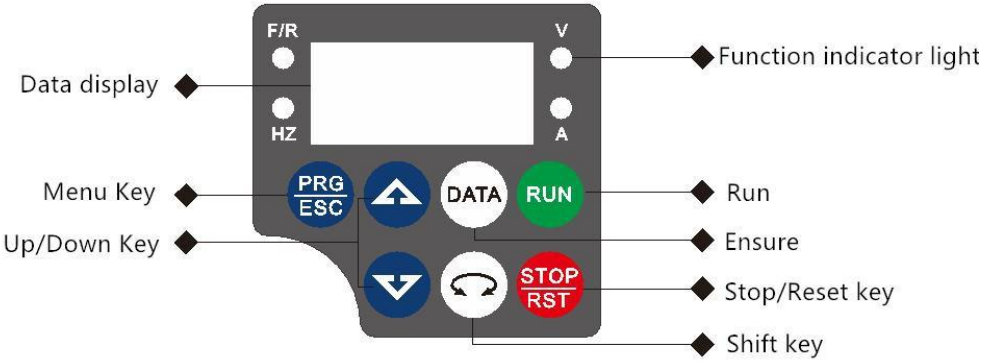
4.Outsize





Voltage	Model type	power（kW）	Install size（mm）		outsize（mm）			Install hole
			A	B	W	H	D	
Single phase 220V	EV200-0400G-S2	0.4	60	129	73	143	112.6	Φ4.4
	EV200-0750G-S2	0.75						
	EV200-1500G-S2	1.5						
	EV200-2200G-S2	2.2						
Three phase 380V	EV200-0750G-T3	0.75						
	EV200-1500G-T3	1.5						
	EV200-2200G-T3	2.2						
	EV200-3700G-T3	3.7	73	168	85.5	180	116.4	Φ4.4
	EV200-5500G-T3	5.5						

5. Panel diagram

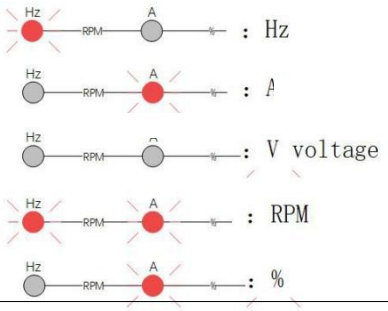


Signal	Name	Function
PRG/ESC	Menu key	Enter or exit Level I menu. Return to the previous menu.
DATA	Ensure	Enter each level of menu interface. Confirm displayed parameter setting.
∧	UP	Data or function code increase
∨	DOWN	Data or function code decrease
⟲	Shift	In the shutdown display interface and run the display interface, you can cycle to select the display parameters; modify the parameters, you can select the parameters of the modified bit
RUN	Run	Start the AC drive when using the operating panel control mode.
STOP	Stop/reset key	Stop the AC drive when the drive is in the RUNNING status, controlled by P7-02 Perform a reset operation when the drive is in the FAULT status.not control by P7-02

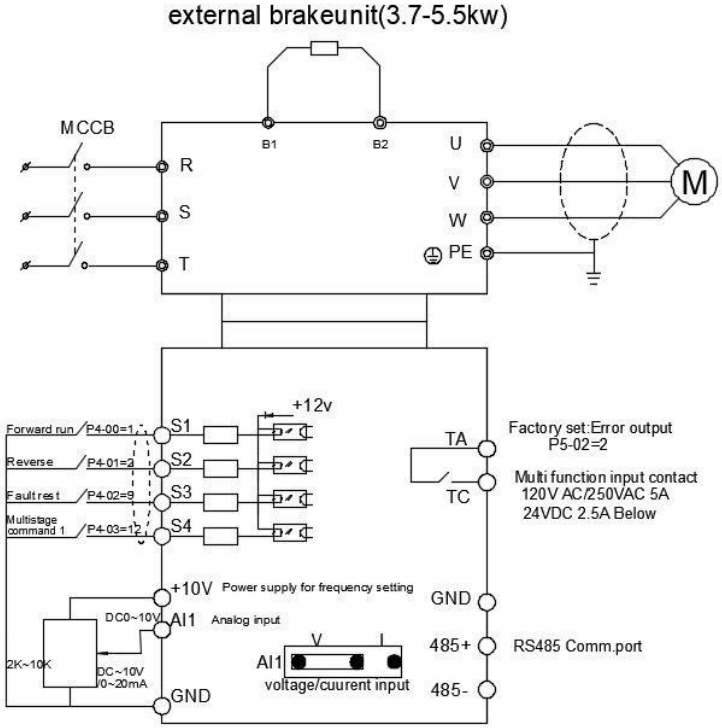
6. Lighting

power off，light ，light flash

Light		Statue
F/R		shinning：R
		Light：F



7.Standard Wiring Diagram



8.Function Parameters Table

When PP-00 is set as a non-zero value, that is, the parameter protection password is set. In the function parameter and the user changes the parameter mode, the parameter menu must enter the password correctly. It can cancel the password protection function by setting PP-00 as 0.

The parameter menu in user-defined parameter mode is not password protected.
Group P and A include basic function parameters, group d includes the monitoring function parameters. The symbols in the function code table are described asfollows:

"☆" : it is possible to modify the parameter when the drive in the stop or in the run

status;

"★" :Indicates that the setting value of this parameter cannot be changed when the inverter is running;

"●" : the parameter is the actual measured value and can not bemodified.

"*" : the parameter is a "factory parameter", can be set only by the manufacturer, prohibit the user to operate.

Basic Function Parameters Table

Function Code	Name	Setting Range	Default	Modify
P0 Group: Basic Function				
P0-01	Motor 1 control mode	0: No speed sensor vector control (SVC) 1: Speed sensor vector control (FVC) 2: V/F control	2	★
P0-02	Command source selection	0:Operation panel instruction channel 1:Terminal command channel 2:communication command channel	0	☆

P0-03	Main frequency reference setting A channel selection	0: digital setting (preset frequency P0-08, UP/DOWN) can be modified, power is not Memory) 1: digital setting (preset frequency P0-08, UP/DOWN can be modified, power-down memory 2: AI1 (Note: J4 jumper in the PANEL and AI1 connected to the keyboard potentiometer input, PORT and AI1 connected to the external terminal AI1 input)	2	★
P0-04	Auxiliary frequency source B command input selection	With P0-03 (main Frequency source A instruction input selection)	0	★
P0-05	Auxiliary frequency source B Reference object selection	0: relative to maximumfrequency 1: relative to frequency source A	0	☆
P0-06	Auxiliary frequency source B command range	0%~150%	100%	☆
P0-07	Frequency source combination mode selection	Bit: frequency source selection 0: Main frequency source A 1: main and auxiliary operation results (operation relationship determined by ten) 2: Main frequency source A and auxiliary frequency source B switch 3: Main frequency source A and master and slave operation result switching 4: auxiliary frequency source B and master and slave operation result switching Ten: frequency source main and auxiliary operation relationship 0: main + auxiliary 1: main - auxiliary 2: the two maximum 3: the two minimum	00	☆

Function Code	Name	Setting Range	Default	Modify
P0-08	Preset frequency	0.00Hz~max (P0-10) frequency	50.00Hz	☆
P0-09	Running direction	0: same direction 1: opposite direction	0	☆
P0-10	Max. frequency	50.00Hz~500.00Hz	50.00Hz	★
P0-11	Setting channel of frequency upper limit	0: P0-12 is set 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3 4: High-speed pulse setting (S5) 5: communication given	0	★
P0-12	Frequency reference upper limit	Upper limit frequency P0-10 P0-14~max	50.00Hz	☆
P0-13	Frequency reference upper limit offset	0.00Hz~max Frequency	0.00Hz	☆
P0-14	Frequency reference lower limit	0.00Hz~frequency upper limit P0-12	0.00Hz	☆
P0-15	Carrier frequency	0.8KHz~12.0KHz	Model dependent	☆
P0-16	Carrier frequency adjusted with temperature	0: Disabled	1	☆
P0-17	Acceleration time 1	0.00s~65000s	Model dependent	☆
P0-18	Deceleration time 1	0.00s~65000s	Model dependent	☆
P0-19	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
P0-21	Frequency offset of auxiliary frequency setting channel for main and auxiliary calculation	0.00Hz~max.frequency P0-10	0.00Hz	☆
P0-22	Frequency reference resolution	2: 0.01Hz	2	★
P0-23	Retentive of digital setting frequency upon stop	0: do not remember 1: memory	1	☆
P0-24	Motor parameter group selection	0: 1st motor parameter 1: 2nd motor parameter	0	★

Function Code	Name	Setting Range	Default	Modify
P0-25	Acceleration/ Deceleration time base frequency	0:maximum (P0-10) Frequency 1: Set frequency 2: 100Hz	0	★
P0-26	Base frequency for UP/DOW modification during running	0: Run frequency 1: Set frequency	0	★
P0-27	The run command is tied to the main frequency source A command selection	Bit: Operation panel command Bind frequency source selection 0: no binding 1: Digital setting frequency 2: AI1 (Note: J6 jumper) 3: AI2 4: AI3 5: High-speed pulse input setting (S5) 6: multi-speed 7: Simple PLC 8: PID 9: communication given Ten: Terminal Command Binding Frequency Source Selection Hundreds: communication command binding frequency source selection	0000	☆
P0-28	Serial port Communication protocol	0: Modbus communication 1：reserve	0	☆
P1 Group: Motor 1 Parameters				
P1-00	Motor type selection	0: ordinary asynchronous motor 1: Variable frequency asynchronous motor	0	★
P1-01	Rated motor power	0.1KW~1000.0KW	Model dependent	★
P1-02	Rated motor voltage	1V~2000V	Model dependent	★
P1-03	Rated motor current	0.01 to 655.35A (AC drive power ≤ 55 KW) 0.1 to 6553.5A (AC drive power > 55 KW)	Model dependent	★
P1-04	Rated motor frequency	0.01Hz~max. frequency	Model dependent	★
P1-05	Rated motor speed	1rpm~65535rpm	Model dependent	★

Function Code	Name	Setting Range	Default	Modify
P1-06	Stator resistance	0.001Ω~65.535Ω (AC drive power≤55KW) 0.0001Ω~6.5535Ω (AC drive power>55KW)	Auto- tuning dependent	★
P1-07	Rotor resistance	0.001Ω~65.535Ω (AC drive power≤55KW) 0.0001Ω~6.5535Ω (AC drive power>55KW)	Auto- tuning dependent	★
P1-08	Leakage inductive reactance	0.01mH~655.35mH (AC drive power≤55KW) 0.001mH~65.535mH (AC drive power>55KW)	Auto- tuning dependent	★
P1-09	Mutual inductive reactance	0.1mH~6553.5mH (AC drive power≤55KW) 0.01mH~655.35mH (AC drive power>55KW)	Auto- tuning dependent	★
P1-10	No-load current	0.01A~P1-03 (AC drive power≤55KW) 0.1A~P1-03 (AC drive power>55KW) 0.1A~P1-03 (AC drive power>55KW)	Auto- tuning dependent	★
P1-27	Encoder pulses per revolution	1~65535	1024	★
P1-28	Encoder type	0: ABZ incremental encoder 2: Resolver	0	★
P1-30	A/B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★
P1-34	Number of pole pairs of resolver	1~65535	1	★
P1-36	Encoder wire-break fault detection time	0.0: no operation 0.1s~10.0s	0.0s	★
P1-37	Motor auto-tuning method selection	0: no operation 1:Asynchronous machine static part of the parameters of self-learning 2: asynchronous machine dynamic complete self-learning 3:asynchronous machine static complete self-learning	0	★
P2 Group: Vector Control Parameters				
P2-00	Speed loop proportional gain 1	1~100	30	☆

Function Code	Name	Setting Range	Default	Modify
P2-01	Speed loop integral time 1	0.01s~10.00s	0.50s	☆
P2-02	Switchover frequency 1	0.00~P2-05	5.00Hz	☆
P2-03	Speed loop proportional gain 2	1~100	20	☆
P2-04	Speed loop integral time 2	0.01s~10.00s	1.00s	☆
P2-05	Switchover frequency 2	P2-02~max frequency (P0-10)	10.00Hz	☆
P2-06	SVC/FVC slip compensation gain	50%~200%	100%	☆
P2-07	SVC Speed feedback filter time constant	0.000s~0.100s	0.015s	☆
P2-09	Torque limit source in speed control	0: function code P2-10 setting 1: AI1 2: AI2 3: AI3 4: high-speed pulse input setting (S5) 5: communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 1-7 option full scale corresponds to P2-10	0	☆
P2-10	Digital setting of torque limit in speed control	0.0%~200.0%	150.0%	☆
P2-11	Torque limit source in speed control (in regenerative state)	0: Function code P2-12 setting (no distinction between electric and power generation) 1: AI1 2: AI2 3: AI3 4:High-speed pulse input setting 5: communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 8: Function code P2-12setting 1-7 The full scale of the option corresponds to P2-12	0	☆
P2-12	Digital setting of torque limit in speed control (in regenerative state)	0.0%~200.0%	150.0%	☆
P2-13	Excitation adjustment proportional gain	0~60000	2000	☆

Function Code	Name	Setting Range	Default	Modify
P2-14	Excitation adjustment integral gain	0~60000	1300	☆
P2-15	Torque adjustment proportional gain	0~60000	2000	☆
P2-16	Torque adjustment integral gain	0~60000	1300	☆
P2-17	Speed loop integral separation selection	0: Disabled 1: Enabled	0	☆
P2-20	Max output voltage	-	-	-
P2-21	Max. torque coefficient of field weakening area	50~200%	100%	☆
P2-22	Regenerative power limit selection	0: Disabled 1: Enabled	0	☆
P2-23	Regenerative power limit	0~200%	Model dependent	☆
P3 Group: V/F Control Parameters				
P3-00	V/F curve setting	0: Straight line V/F 1: multipoint V/F 2: square V/F 3: 1.2 Power V/F 4: 1.4 Power V/F 6: 1.6 Power V/F 8: 1.8 power V/F 9: Reserved 10: VF complete separation mode 11: VF semi-separation mode	0	★
P3-01	Torque boost	0.0%: (Ineffective) 0.1%~30.0%	Model dependent	☆
P3-02	Cut-off frequency of torque boost	0.00Hz~max. frequency	50.00Hz	★
P3-03	Multi-point V/F frequency 1	0.00Hz~P3-05	0.00Hz	★
P3-04	Multi-point V/F voltage 1	0.0%~100.0%	0.0%	★
P3-05	Multi-point V/F frequency 2	P3-03~P3-07	0.00Hz	★
P3-06	Multi-point V/F voltage 2	0.0%~100.0%	0.0%	★
P3-07	Multi-point V/F frequency 3	P3-05~rated motor frequency (P1-04)	0.00Hz	★
P3-08	Multi-point V/F voltage 3	0.0%~100.0%	0.0%	★

Function Code	Name	Setting Range	Default	Modify
P3-09	Slip compensation gain	-	-	-
P3-10	V/F over-excitation gain	0~200	64	☆
P3-11	V/F oscillation suppression gain	0~100	40	☆
P3-13	Voltage source for V/F separation	0: digital setting (P3-14) 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3 4: High-speed pulse input setting (S5) 5: multi-segment instructions 6: Simple PLC 7: PID 8: communication given Note: 100.0% corresponds to the motor rated voltage	0	☆
P3-14	Digital setting of Voltage for V/F separation	0V~rated motor voltage	0V	☆
P3-15	Voltage rise time of V/F separation	0.0s~1000.0s Note: 0V to rated motor voltage	0.0s	☆
P3-16	Voltage decline time of V/F separation	0.0s~1000.0s Note: time of 0V to rated motor voltage	0.0s	☆
P3-17	Stop mode selection for V/F separation	0: Frequency and voltage declining to 0 independently 1: Frequency declining after voltage declines to 0	0	☆
P3-18	Current limit level	50~200%	150%	★
P3-19	Current limit selection	0: useless 1: useful	1	★
P3-20	Current limit gain	0~100	20	☆
P3-21	Compensation factor of speed multiplying current limit level	50~200%	50%	★
P3-22	Voltage limit	650V~800.0V	770V	★
P3-23	Voltage limit selection	0: useless 1: useful	1	★
P3-24	Frequency gain for voltage limit	0~100	30	☆
P3-25	Voltage gain for voltage limit	0~100	30	☆
P3-26	Frequency rise threshold during voltage limit	0~50Hz	5Hz	★

Function Code	Name	Setting Range	Default	Modify
P3-27	Slip compensation time constant	0.1~10.0s	0.5s	☆
P4 Group: Input Terminals				
P4-00	S1 function selection	0: no function 1: Forward run (FWD) or run command 2: reverse run (REV) or positive and negative running direction (Note: set 1, 2 to be used with P4-11) 3: three-wire operation control 4: forward jog (FJOG) 5: reverse jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: free parking 9: Fault reset (RESET) 10: run pause 11: External fault normally open input 12: Multi-step command terminal 1 13: Multi-step command terminal 2 14: Multi-step command terminal 3 15: Multi-step command terminal 4 16: Acceleration/Deceleration time selection terminal 1 17: Acceleration/Deceleration time selection terminal 2 18: Frequency command switching 19: UP/DOWN setting clear (terminal, keyboard) 20: control command to switch terminal 1 21: Acceleration/Deceleration is prohibited 22: PID pause 23: Easy PLC status reset	1	★
P4-01	S2 function selection		4	★
P4-02	S3 function selection		9	★
P4-03	S4 function selection		12	★
P4-08	Reserved		-	★
P4-09	Reserved		-	★

Function Code	Name	Setting Range	Default	Modify
		29: Torque control disabled 30: High-speed pulse input (only valid for S5) 31: Reserved 32: Immediate DC braking 33: External fault normally closed input 34: Frequency modification enabled 35: PID direction is reversed 36: External parking terminal 1 37: control command to switch terminal 2 38: PID integral is paused 39: Frequency source A and preset frequency switching 40: Frequency source B and preset frequency switching 41: Motor terminal selection function 42: Reserved 43: PID parameter switch 44: User defined fault 1 45: user defined fault 2 46: Speed control/torque control switching 47: Emergency stop 48: External parking terminal 2 49: Deceleration of DC braking 50: This run time is cleared 51:two-wire/three-wire switch 52:Reverse frequency disabled 53-59: Reserved		
P4-10	S1~S4 filter time	0.000s~1.000s	0.010s	☆
P4-11	Terminal control mode	0: two lines 1 1: two lines 2 2: three lines 1 3: three lines 2	-	★

Function Code	Name	Setting Range	Default	Modify
P4-12	Terminal UP/DOWN rate	0.001Hz/s~65.535Hz/s	1.00Hz/s	☆
P4-13	AI curve 1 min. input	0.00V~P4-15	0.00V	☆
P4-14	Corresponding percentage of AI curve 1 min. input	-100.0%~+100.0%	0.0%	☆
P4-15	AI curve 1 max. input	P4-13~+10.00V	10.00V	☆
P4-16	Corresponding percentage of AI curve 1 max. input	-100.0%~+100.0%	100.0%	☆
P4-17	AI1 filter time	0.00s~10.00s	0.10s	☆
P4-18	AI curve 2 min. input	0.00V~P4-20	0.00V	☆
P4-19	Corresponding percentage of AI curve 2 min. input	-100.0%~+100.0%	0.0%	☆
P4-20	AI curve 2 max. input	P4-18~+10.00V	10.00V	☆
P4-21	Corresponding percentage of AI curve 2 max. input	-100.0%~+100.0%	100.0%	☆
P4-22	AI2 filter time	0.00s~10.00s	0.10s	☆
P4-23	AI3 curve min. input	-10.00V~P4-25	-10.0V	☆
P4-24	Corresponding percentage of AI curve 3 min. input	-100.0%~+100.0%	-100.0%	☆
P4-25	AI curve 3 max. input	P4-23~+10.00V	10.00V	☆
P4-26	Corresponding percentage of AI curve 3 max. input	-100.0%~+100.0%	100.0%	☆
P4-27	AI3 filter time	0.00s~10.00s	0.10s	☆
P4-28	Pulse min. input	0.00kHz~P4-30	0.00KHz	☆
P4-29	Corresponding percentage of pulse min. input	-100.0%~100.0%	0.0%	☆
P4-30	Pulse max. input	P4-28~100.00kHz	50.00KHz	☆
P4-31	Corresponding percentage of pulse max. input	-100.0%~100.0%	100.0%	☆

Function Code	Name	Setting Range	Default	Modify
P4-32	Pulse filter time	0.00s~10.00s	0.10s	☆
P4-33	AI curve selection	Bit: AI1 curve selection 1: curve 1 (2 points, see P4-13~P4-16) 2: Curve 2 (2 points, see P4-18~P4-21) 3: curve 3 (2 points, see P4-23~P4-26) 4: curve 4 (4 points, see A6-00~A6-07) 5: curve 5 (4 points, see A6-08~A6-15) Ten: AI2 curve selection, ibid Hundreds: AI3 curve selection, ibid	321	☆
P4-34	Setting selection when AI less than min. input	Bit: AI1 is lower than the minimum input setting 0: corresponds to the minimum input setting 1: 0.0% Ten: AI2 is lower than the minimum input setting, ibid Hundreds: AI3 is lower than the minimum input setting, ibid	000	☆
P4-35	S1 delay	0.0s~3600.0s	0.0s	★
P4-36	S2 delay	0.0s~3600.0s	0.0s	★
P4-37	S3 delay	0.0s~3600.0s	0.0s	★
P4-38	S1~S5 active mode selection 1	0: active high 1: active low Bit: S1 Ten: S2 Hundred places: S3 Thousands of bits: S4 Million: S5	00000	★
P4-39	S6, S7 active mode selection 2	0: active high 1: active low Bit: S6 Ten: S7 Hundred places: reserved Thousands of places: reserved Million: reserved	00000	★

P5 Group: Output Terminals				
Function Code	**Name**	**Setting Range**	**Default**	**Modify**
P5-02	Relay 1 function selection (TA-TC)	0: pulse output (HDP) 1: Switching output (HDY)		
		0: No output 1: The inverter is running 2: fault output (fault stop) 3: Frequency level detection FDT1 output 4: frequency arrives 5: Zero speed operation (no output at shutdown) 6: motor overload pre-alarm 7: Inverter overload pre-alarm 8: Set the count value to reach 9: Specifies that the count value arrives 10: length to reach 11: PLC cycle is complete 12: The cumulative run time arrives 13: Frequency limit 14: Torque limit 15: Ready to run 16: AI1>AI2 17: upper limit frequency arrival 18: Lower frequency arrival (operation related) 19: Under voltage status output 20: communication settings 21: Positioning completed (reserved) 22: positioning close (reserved) 23: zero speed running 2 (also output when stopped) 24: The total power-up time arrives 25: Frequency level detection FDT2 output 26: Frequency 1 reaches the output 27: Frequency 2 reaches the output 28: current 1 reaches the output 29: current 2 reaches the output		

Function Code	Name	Setting Range	Default	Modify
		30: Timing arrival output 31: AI1 input is overrun 32: Under load 33: reverse running 34: zero current state 35: Module temperature arrives 36: Output current is exceeded 37: Lower frequency arrival (shutdown also output) 38: Alarm output (continued) 39:Motor over temperature warning 40: This run time arrives 41: fault output (for free stop fault), and under voltage is not output		
P6 Group: Start/Stop Control				
P6-00	Start mode	0: Direct start 1: Catching a spinning motor 2: Pre-excited start 3: SVC quick start	0	☆
P6-01	Mode of catching a spinning motor	0: From stop frequency 1: From 50Hz 2: From max. frequency	0	★
P6-02	Speed of catching a spinning motor	1~100	20	☆
P6-03	Start frequency	0.00Hz~10.00Hz	0.00Hz	☆
P6-04	Start frequency holding time	0.0s~100.0s	0.0s	★
P6-05	DC injection braking 1 level/pre-excitation level	0%~100%	50%	★
P6-06	DC injection braking 1 active time/ pre-excitation active time	0.0s~100.0s	0.0s	★
P6-07	Acceleration/ Deceleration mode	0:Linear acceleration/ deceleration 1:S-curve acceleration/ deceleration A(static) 2:S curve acceleration/ deceleration B (dynamic)	0	★

Function Code	Name	Setting Range	Default	Modify
P6-08	Time proportion of S-curve start segment	0.0%~(100.0%-P6-09)	30.0%	★
P6-09	Time proportion of S-curve end segment	0.0%~(100.0%-P6-08)	30.0%	★
P6-10	Stop mode	0: Decelerate to stop 1: Coast to	0	☆
P6-11	DC injection braking 2 start frequency	0.00Hz~max.frequency (P0-10)	0.00Hz	☆
P6-12	DC injection braking 2 delay time	0.0s~100.0s	0.0s	☆
P6-13	DC injection braking 2 level	0%~100%	50%	☆
P6-14	DC injection braking 2 active time	0.0s~100.0s	0.0s	☆
P6-15	Braking use ratio	0%~100%	100%	☆
P6-18	Catching a spinning motor current limit	30%~200%	Model dependent	☆
P6-21	Demagnetization time (effective for SVC)	0.00~5.00s	Model dependent	☆
P7 Group: Keypad Operation and LED Display				
P7-02	STOP/RESET key function	0: The STOP/RES key stop function is valid only during keyboard operation 1: STOP/RES key shutdown is active in any mode of operation	1	☆
P7-03	LED display running parameters 1	0000~FFFF Bit00: Operating frequency 1 (Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: S terminal input status Bit08: HDO output status Bit09: AI1 voltage (V) Bit10: AI2 Voltage (V) Bit11: AI3 Voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆

Function Code	Name	Setting Range	Default	Modify
P7-04	LED display running parameters 2	0000~FFFF Bit00: PID feedback Bit01: PLC stage Bit02: High-speed pulse input frequency (kHz) Bit03: Operating frequency 2 (Hz) Bit04: Remaining runtime Bit05: AI1 before correction voltage (V) Bit06: AI2 before correction voltage (V) Bit07: AI3 Correction before voltage (V) Bit08: Line speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: High-speed pulse input frequency (Hz) Bit12: Communication setpoint Bit13: Encoder feedback speed (Hz) Bit14: Main frequency A display (Hz) Bit15: Secondary frequency B display (Hz)	0	☆
P7-05	LED display stop parameters	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: S input status Bit03: HDO output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: High-speed pulse input frequency (kHz)	33	☆
P7-06	Load speed Display coefficient	0.0001~6.5000	1.0000	☆

Function Code	Name	Setting Range	Default	Modify
P7-06	Load speed display coefficient	0.0001~6.5000	1.0000	☆
P7-07	Heatsink temperature of AC Drive IGBT	-20.0℃~120.0℃	-	●
P7-09	Accumulative running time	0h~65535h	-	●
P7-12	Number of decimal places for load speed display	Bit: d0-14 the number of decimal places 0: 0 decimal places 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places Ten: d0-19/d0-29 the number of decimal places 1: 1 decimal place 2: 2 decimal places	21	☆
P7-13	Accumulative power-on time	0h~65535h	-	●
P7-14	Accumulative power consumption	0kW~65535kwh	-	●
P8 Group: AuxiliaryFunctions				
P8-04	Deceleration time 2	0.0s to 6500.0s	Model dependent	☆
P8-05	Acceleration time 3	0.0s to 6500.0s	Model dependent	☆
P8-06	Deceleration time 3	0.0s to 6500.0s	Model dependent	☆
P8-07	Acceleration time 4	0.0s to 6500.0s	Model dependent	☆
P8-08	Deceleration time 4	0.0s to 6500.0s	Model dependent	☆
P8-09	Frequency jump 1	0.00Hz to max. frequency	0.00Hz	☆
P8-10	Frequency jump 2	0.00Hz to max. frequency	0.00Hz	☆
P8-11	Frequency jump band	0.00Hz to max. frequency	0.00Hz	☆
P8-12	Forward/Reverse run switch over dead-zone time	0.0s to 3000.0s	0.0s	☆
P8-13	Reverse RUN selection	0, 1	0	☆

Function Code	Name	Setting Range	Default	Modify
P8-14	Running mode when frequency reference lower than frequency lower limit	0 to 2	0	☆
P8-15	Droop rate	0.00% to 100.00%	0.00%	☆
P8-16	Accumulative power-on time threshold	0 to 65000h	0h	☆
P8-17	Accumulative running time threshold	0 to 65000h	0h	☆
P8-18	Startup protection selection	0, 1	0	☆
P8-19	Frequency detection value 1	0.00Hz to max. frequency	50.00Hz	☆
P8-20	Frequency detection hysteresis 1	0.0% to 100.0%	5.0%	☆
P8-21	Detection width of target frequency reached	0.0% to 100.0%	0.0%	☆
P8-22	Jump frequency function	0, 1	0	☆
P8-25	Switchover frequency of accel time 1 and accel time 2	0.00Hz to max. frequency	0.00Hz	☆
P8-26	Switchover frequency of decel time 1 and decel time 2	0.00Hz to max. frequency	0.00Hz	☆
P8-27	Set highest priority to terminal JOG function	0, 1	0	☆
P8-28	Frequency detection value 2	0.00Hz to max. frequency	50.00Hz	☆
P8-29	Frequency detection hysteresis 2	0.0% to 100.0%	5.0%	☆

Function Code	Name	Setting Range	Default	Modify
P8-30	Detection of frequency 1	0.00Hz to max. frequency	50.00Hz	☆
P8-31	Detection width of frequency 1	0.0% to 100.0% (max. frequency)	0.0%	☆
P8-32	Detection of frequency 2	0.00Hz to max. frequency	50.00Hz	☆
P8-33	Detection width of frequency 2	0.0% to 100.0% (max. frequency)	0.0%	☆
P8-34	Zero current detection level	0.0% to 300.0% (rated motor current)	5.0%	☆
P8-35	Zero current detection delay	0.01s to 600.00s	0.10s	☆
P8-36	Output over current threshold	1.1% (no detection) 1.2% to 300.0% (rated motor current)	200.0%	☆
P8-37	Output over current detection delay	0.00s to 600.00s	0.00s	☆
P8-38	Detection level of current 1	0.0% to 300.0% (rated motor current)	100.0%	☆
P8-39	Detection width of current 1	0.0% to 300.0% (rated motor current)	0.0%	☆
P8-40	Detection level of current 2	0.0% to 300.0% (rated motor current)	100.0%	☆
P8-41	Detection width of current 2	0.0% to 300.0% (rated motor current)	0.0%	☆
P8-42	Timing function	0, 1	0	★
P8-43	Timing duration source	0 to 3	0	★
P8-44	Timing duration	0.0 to 6500.0 min	0.0 min	★
P8-45	AI1 input voltage lower limit	0.00V to F8-46	3.10V	☆

Function Code	Name	Setting Range	Default	Modify
P8-46	AI1 input voltage upper limit	F8-45 to 10.00V	6.80V	☆
P8-47	Sleep mode selection	0:no sleep 1:no sleep pressure judgment 2:sleep pressure= setting pressure*sleep pressure percentage wake up pressure= setting pressure* wake up pressure percentage	0	☆
P8-49	sleep pressure	90%-100%	98%	☆
P8-50	Wake up pressure	0%-100%	60%	☆
P8-51	sleep frequency	0HZ-50HZ	30Hz	☆
P8-52	Wake up frequency	0HZ-50HZ	40HZ	☆
P8-53	wake up delay	0-6500S	3 .0S	☆
P8-54	sleep delay	0-6500S	5.0 S	☆
P9 Group: Fault and Protection				
P9-00	Motor overload protection	0: Forbidden 1: Allowed	1	☆
P9-01	Motor overload protection gain	0.20 to 10.00	1.00	☆
P9-02	Motor overload pre-warning coefficient	50% to 100%	80%	☆
P9-03	Overvoltage protection gain	0~100	30	☆
P9-04	Overvoltage protection voltage	650 to 800V	770V	☆

Function Code	Name	Setting Range	Default	Modify
P9-07	Dection of short- circuit to ground upon power-on	Units: Power-to-ground short-circuit protection selection 0: Invalid 1: valid Tens place: Selection of short- to-ground protection before running 0: Invalid 1: valid	01	☆
P9-08	Braking unit applied voltage	650 to 800V	720V	☆
P9-09	Auto reset times	0 to 20	0	☆
P9-10	Selection of DO action during auto reset	0: No action 1: Action	0	☆
P9-11	Delay of auto reset	0.1s to 100.0s	1.0s	☆
P9-12	Input phase loss/ pre-charge relay protection	Unit digit: input phase loss protection selection Tenth place: Contactor pull-in protection selection 0: Forbidden 1: Allowed	-	-
P9-13	Output phase loss protection	Unit digits : output phase loss protection selection 0: Forbidden 1: Allowed Tens place: output phase loss protection selection before running	11	☆
P9-14	1st fault type	00-55	-	●
P9-15	2nd fault type		-	●
P9-16	3rd (latest) fault type		-	●
P9-17	Frequency upon 3rd fault	-	-	●
P9-18	Current upon 3rd fault	-	-	●
P9-19	Bus voltage upon 3rd fault	-	-	●

P9-20	DI state upon 3rd fault	-	-	●
P9-21	DO state upon 3rd fault	-	-	●
P9-22	AC drive state upon 3rd fault	-	-	●
P9-23	Power-on time upon 3rd fault	-	-	●
P9-24	Running time upon 3rd fault	-	-	●
P9-27	Frequency upon 2nd fault	-	-	●
P9-28	Current upon 2nd fault	-	-	●
P9-29	Bus voltage upon 2nd fault	-	-	●
P9-30	DI state upon 2nd fault	-	-	●
P9-31	DO state upon 2nd fault	-	-	●
P9-32	AC drive state upon 2nd fault	-	-	●
P9-33	Power-on time upon 2nd fault	-	-	●
P9-34	Running time upon 2nd fault	-	-	●
P9-37	Frequency upon 1st fault	-	-	●
P9-38	Current upon 1st fault	-	-	●
P9-39	Bus voltage upon 1st fault	-	-	●

P9-40	DI state upon 1st fault	-	-	●
P9-41	DO state upon 1st fault	-	-	●
P9-42	AC drive state upon 1st fault	-	-	●
P9-43	Power-on time upon 1st fault	-	-	●
P9-44	Running time upon 1st fault	-	-	●
P9-47	Fault protection action selection 1	0：free 1:stop 2.continue running	00000	☆
P9-48	Fault protection action selection 2	00000 to 11111	00000	☆
P9-49	Fault protection action selection 3	00000 to 22222	00000	☆
P9-50	Fault protection action selection 4	00000 to 22222	00000	☆
P9-54	Frequency selection for continuing to run upon fault	0 to 4	0	☆
P9-55	Backup frequency upon fault	0.0% to 100.0% (max. FrequencyP0-10)	100.0%	☆
P9-56	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	-	-
P9-59	Power dip ride-through function selection	0: Invalid 1: constant bus voltage control 2: deceleration stop	0	☆
P9-60	Threshold of power dip ride through function disabled	80% to 100%	85%	☆

P9-62	Threshold of power dip ride through function enabled	60% to 100%	80%	☆
P9-63	Load lost protection	0: Disabled 1: Enabled	0	☆
P9-64	Load lost detection level	0.0% to 100.0%	10.0%	☆
P9-65	Load lost detection time	0.0s to 60.0s	1.0s	☆
P9-67	Overspeed detection level	0.0% to 50.0% (max.frequency)	20.0%	☆
P9-68	Overspeed detection time	0.0s to 60.0s	1.0s	☆
P9-69	Detection level of speed error	0.0% to 50.0% (max.frequency)	20.0%	☆
P9-70	Detection time of speed error	0.0s to 60.0s	5.0s	☆
P9-71	Power dip ride-through gain Kp	0 to 100	40	☆
P9-72	Power dip ride-through integral coefficient	0 to 100	30	☆
P9-73	Deceleration time of power dip ride-through	0.0s to 300.0s	20.0s	★
PA Group: PID Function				
Function Code	**Name**	**Setting Range**	**Default**	**Modify**
PA-00	PID reference setting channel	0: PA-01 setting 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3 4: High-speed pulse input setting (S5) 5: Communication given 6: Multi-section instruction given	0	☆

PA-01	PID digital setting	0.0v% to 100.0%	50.0%	☆
PA-02	PID feedback	0: AI1 (Note: J6 jumper) 1: AI2 2: AI3 3: AI1-AI2 4: High-speed pulse input setting (S5) 5: Communication given 6: AI1 + AI2 7: MAX (| AI1 |, | AI2 |) 8: MIN (| AI1 |, | AI2 |)	0	☆
PA-03	PID operation direction	0: Positive action 1: reaction	0	☆
PA-04	PID reference and feedback range	0 to 65535	1000	☆
PA-05	Proportional gain Kp1	0.0 to 1000.0	20.0	☆
PA-06	Integral time Ti1	0.01s to 10.00s	2.00s	☆
PA-07	Differential time Td1	0.000s to 10.000s	0.000s	☆
PA-08	PID output limit in reverse direction	0.00 Hz to max. Frequency P0-10	0.00Hz	☆
PA-09	PID error limit	0.0% to 100.0%	0.0%	☆
PA-10	PID differential limit	0.00% to 100.00%	0.10%	☆
PA-11	PID reference change time	0.00s to 650.00s	0.00s	☆
PA-12	PID feedback filter time	0.00s to 60.00s	0.00s	☆
PA-13	PID output filter time	0.00s to 60.00s	0.00s	☆
PA-14	Reserved	-	-	-
PA-15	Proportional gain Kp2	0.0 to 1000.0	20.0	☆
PA-16	Integral time Ti2	0.01s to 10.00s	2.00s	☆
PA-17	Differential time Td2	0.000s to 10.000s	0.000s	☆
PA-18	PID parameter switch over condition	0 to 3	0	☆
PA-19	PID error 1 for auto switch over	0.0% to PA-20	20.0%	☆
PA-20	PID error 2 for auto switch over	PA-19 to 100.0%	80.0%	☆

PA-21	PID initial value	0.0% to 100.0%	0.0%	☆
PA-22	PID initial value active time	0.00s to 650.00s	0.00s	☆
PA-23	Twice output deviation forward maximum	0.0% to 100.0%	1.00%	☆
PA-24	The maximum value of the output deviation is reversed twice	0.0% to 100.0%	1.00%	☆
PA-25	PID integral property	00 to 11	00	☆
PA-26	Detection level of PID feedback loss	0.0%: No detection 0.1% to 100.0%	0.0%	☆
PA-27	Detection time of PID feedback loss	0.0s to 20.0s	0.0s	☆
PA-28	Selection of PID operation at stop	0, 1	0	☆
Pb Group: Wobble Function, Fixed Length and Count				
Pb-00	Wobble setting mode	0, 1	0	☆
Pb-01	Wobble amplitude	0.0% to 100.0%	0.0%	☆
Pb-02	Wobble step	0.0% to 50.0%	0.0%	☆
Pb-03	Wobble cycle	0.1s to 3000.0s	10.0s	☆
Pb-04	Triangular wave rising time coefficient	0.1% to 100.0%	50.0%	☆
Pb-05	Set length	0 to 65535m	1000m	☆
Pb-06	Actual length	0 to 65535m	0m	☆
PC Group: Multi-reference and Simple PLC Function				
PC-07	Reference 7	-100.0% to 100.0%	0.0%	☆
PC-08	Reference 8	-100.0% to 100.0%	0.0%	☆
PC-09	Reference 9	-100.0% to 100.0%	0.0%	☆
PC-10	Reference 10	-100.0% to 100.0%	0.0%	☆
PC-11	Reference 11	-100.0% to 100.0%	0.0%	☆
PC-12	Reference 12	-100.0% to 100.0%	0.0%	☆
PC-13	Reference 13	-100.0% to 100.0%	0.0%	☆
PC-14	Reference 14	-100.0% to 100.0%	0.0%	☆
PC-15	Reference 15	-100.0% to 100.0%	0.0%	☆

PC-16	Simple PLC running mode	0: Stop at the end of a single run 1: Keep the final value at the end of a single run 2: keep circulating	0	☆
PC-17	Simple PLC retentive selection	Single digit: power-down memory selection 0: No memory when power off 1: power-down memory Tenth place: Stop memory selection 0: Stop memory 1: shutdown memory	00	☆
PC-18	Running time of simple PLC reference 0	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-19	Acceleration/ deceleration time of simple PLC reference 0	0 to 3	0	☆
PC-20	Running time of simple PLC reference 1	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-21	Acceleration/ deceleration time of simple PLC reference 1	0 to 3	0	☆
PC-22	Running time of simple PLC reference 2	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-23	Acceleration/ deceleration time of simple PLC reference 2	0 to 3	0	☆
PC-24	Running time of simple PLC reference 3	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-25	Acceleration/ deceleration time of simple PLC reference 3	0 to 3	0	☆

PC-26	Running time of simple PLC reference 4	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-27	Acceleration/ deceleration time of simple PLC reference 4	0 to 3	0	☆
PC-28	Running time of simple PLC reference 5	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-29	Acceleration/ deceleration time of simple PLC reference 5	0 to 3	0	☆
PC-30	Running time of simple PLC reference 6	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-31	Acceleration/ deceleration time of simple PLC reference 6	0 to 3	0	☆
PC-32	Running time of simple PLC reference 7	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-33	Acceleration/ deceleration time of simple PLC reference 7	0 to 3	0	☆
PC-34	Running time of simple PLC reference 8	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-35	Acceleration/ deceleration time of simple PLC reference 8	0 to 3	0	☆
PC-36	Running time of simple PLC reference 9	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-37	Acceleration/ deceleration time of simple PLC reference 9	0 to 3	0	☆
PC-38	Running time of simple PLC reference 10	0.0s (h) to 6500.0s (h)	0.0s (h)	☆

PC-43	Acceleration/ deceleration time of simple PLC reference 12	0 to 3	0	☆
PC-44	Running time of simple PLC reference 13	0.0s (h) to 6500.0s (h)	0.0s (h)	☆
PC-50	Time unit of simple PLC running	0:s, 1:h	0	☆
Pd Group: Communication				
function Code	**Name**	**Setting Range**	**Default**	**Modify**
Pd-00	Baud rate	Bit: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Ten: keep hundred: reserved	005	☆
Pd-01	Data format symbol	0: no parity (8-N-2) 1: Even check (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	0	☆
Pd-02	Local address	0: Broadcast address; 1 to 247	1	☆
Pd-03	Response delay	0 to 20 ms	2	☆
Pd-04	Communication timeout	0.0: invalid 0.1s to 60.0s	0.0	☆

Pd-05	Modbus protocol Selection and PROFIBUS-DP data frame	Bit: MODBUS 0: non-standard MODBUS protocol 1: standard MODBU Sprotocol	30	☆
Pd-06	Current resolution read by communication	0: 0.01 1: 0.1	0	☆
PE Group: User-Defined Parameters				
PE-00	User-defined parameter 0	P0-00 ~ PP-xx A0-00 ~ Ax-xx d0-00 ~ d0-xx d3-00 ~ d3-xx	d3-17	☆
PE-01	User-defined parameter 1		d3-18	☆
PE-02	User-defined parameter 2		P0.00	☆
.....	.....		P0.00	☆
PE-29	User-defined parameter 29		P0.00	☆
PP Group: Function Parameter Management				
PP-00	User password	0 to 65535	0	☆
PP-01	Parameter initialization	0: No operation 1: Restore factory parameters except motor parameters 2: Clear records 4: Back up current user parameters 501: Restore user backup parameters	0	☆

PP-02	Parameter display property	Bit: d group display selection 0: not displayed 1: display Ten: Group A shows the selection 0: not displayed 1: display	11	★
PP-03	Selection of individualized parameter display	Bit: user custom parameter group display selection 0: not displayed 1: display Ten: User Change Parameter Group Display Selection 0: not displayed 1: display	00	☆
PP-04	Selection of parameter modification	0: can be modified 1: can not be modified	0	☆
A0 Group: Torque Control and Limit				
A0-00	Speed/Torque control selection	0: speed control 1: torque control	0	★
A0-01	Torque reference source in torque control	0: Digital setting 1 (A0-03) 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3 4: High-speed pulse input (S5) 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) (1-7 options Full scale, corresponding to A0-03 digital setting)	0	★
A0-03	Torque digital setting in torque control	-200.0% to 200.0%	150.0%	☆
A0-05	Forward max. Frequency in torque control	0.00Hz to max. Frequency (P0-10)	50.00Hz	☆

A0-06	Reverse max. frequency in torque control	0.00Hz (P0-10) to max. Frequency	50.00Hz	☆
A0-07	Acceleration time in torque control	0.00s to 65000s	0.00s	☆
A0-08	Deceleration time in torque control	0.00s to 65000s	0.00s	☆

A2-47	Torque limit source In speed control	0: A2-48 setting 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3 4: High-speed pulse input (S5) 5: communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 1-7 option full scale, corresponding to A2-48 digital	0	☆
A2-48	Digital setting of torque limit in speed control	0.0% to 200.0%	150.0%	☆
A2-49	Torque limit source in speed control (regenerative)	0: Function code P2-10setting 1: AI1 (Note: J6 jumper)	0	☆
Function Code	**Name**	**Setting Range**	**Default**	**Modify**
A5 Group: Control Optimization				
A5-00	DPWM switch over frequency upper limit	5.00Hz to max. frequency	8.00Hz	☆
A5-01	PWM modulation pattern	0, 1	0	☆
A5-02	Dead zone Compensation mode selection	0, 1	1	☆

A5-03	Random PWM depth	0 :PWM invalid 1:PWM can choose	0	☆
A5-04	Over current fast prevention	0:enable 1:uncable	1	☆
A5-05	Voltage over modulation coefficient	100% to 110%	105%	★
A5-06	Under voltage threshold	150 to 420V	350V	☆
A5-08	Dead-zone time adjustment	0.0% to 8.0%	0.0%	★
A5-09	Over voltage threshold	650 to 820V	Model dependent	★
A6 Group: AI Curve Setting				
Function Code	**Name**	**Setting Range**	**Default**	**Modify**
A6-00	AI curve 4 min. input	-10.00V to A6-02	0.00V	☆
A6-01	Corresponding percentage of AI curve 4 min. input	-100.0% to 100.0%	0.0%	☆
A6-02	AI curve 4 inflexion 1 input	A6-00 to A6-04	3.00V	☆
A6-15	Corresponding percentage of AI curve 5 max. input	-100.0% to 100.0%	30.0%	☆
A6-24	Jump point of AI1 input corresponding setting	-100.0% to 100.0%	0.0%	☆
AC Group: AI AO Correction				
AC-00	AI1 measured voltage 1	-10.00 to 10.000V	factory corrected	☆
AC-01	AI1 displayed voltage 1	-10.00 to 10.000V	factory corrected	☆
AC-02	AI1 measured voltage 2	-10.00 to 10.000V	factory corrected	☆
AC-03	AI1 displayed voltage 2	-10.00 to 10.000V	factory corrected	☆

9. Monitoring Parameters

Function Code	Name	Display Range	Communication Address
Group d0: Monitoring Parameters			
d0-00	Running frequency	0.01Hz	7000H
d0-01	Frequency reference	0.01Hz	7001H
d0-02	Bus voltage	0.1V	7002H
d0-03	Output voltage	1V	7003H
d0-04	Output current	0.01A	7004H
d0-05	Output power	0.1kW	7005H
d0-06	Output torque	0.1%	7006H
d0-07	S input state	1	7007H
d0-08	HDO output state	1	7008H
d0-09	AI1 voltage	0.01V	7009H
d0-10	AI2 voltage/current	0.01V/0.01mA	700AH
d0-11	AI3 voltage	0.01V	700BH
d0-12	Count value	1	700CH
d0-13	length value	1	700DH
d0-14	Load speed display	1	700EH
d0-15	PID reference	1	700FH
d0-16	PID feedback	1	7010H
d0-17	PLC stage	1	7011H
d0-18	Pulse reference	0.01kHz	7012H
d0-19	feedback speed	0.01Hz	7013H
d0-20	Remaining running time	0.1Min	7014H
d0-21	AI1 voltage before correction	0.001V	7015H
d0-22	AI2 voltage (V)/ current (MA) before correction	0.001V/0.01mA	7016H
d0-23	AI3 voltage before	0.001V	7017H

Function Code	Name	Display Range	Communication Address
	correction		
d0-24	Motor speed	1m/Min	7018H
d0-25	Accumulative power-on time	1Min	7019H
d0-26	Accumulative running time	0.1Min	701AH

10. Description of Parameters

Group P0: Basic Parameters

Parameter No.	Parameter Name	Setting Range	Default
P0-00	G/P type display	1: G type (constant torque load)	Model dependent

This parameter is used to display the delivered model and cannot be modified.

- 1: Applicable to constant torque load with rated parameters specified

Parameter No.	Parameter Name	Setting Range	Default
P0-01	Motor 1 control mode	0: Sensorless flux vector control (SVC) 1: Closed-loop vector control (FVC) 2: Voltage/Frequency (V/F) control	0

- 0: Sensorless flux vector control (SVC)

  It indicates open-loop vector control, and is applicable to high-performance control applications such as machine tool, centrifuge, wire drawing machine and injection moulding machine. One AC drive can operate only one motor.

- 1: Closed-loop vector control (FVC)

  It is applicable to high-accuracy speed control or torque control applications such as high-speed paper making machine, crane and elevator. One AC drive can operate only one motor. An encoder must be installed at the motor side, and a PG card matching the encoder must be installed at the AC drive side.

- 2: Voltage/Frequency (V/F) control

  It is applicable to applications with low load requirements or applications where one AC drive operates multiple motors, such as fan and pump.

Note

- If vector control is used, motor auto-tuning must be performed because the advantages of vector control can only be utilized after correct motor parameters are obtained. Better performance can be achieved by adjusting speed regulator parameters in group P2.

Parameter No.	Parameter Name	Setting Range	Default
P0-02	Command source selection	0: Operating panel control (LED off) 1: Terminal control (LED on) 2: Communication control (LED blinking)	0

It is used to determine the input channel of the AC drive control commands, such as run, stop, forward rotation, reverse rotation and jog operation. You can input the commands in the following three channels:

- 0: Operating panel control ("LOCAL/REMOT" indicator off)

  Commands are given by pressing keys 

 and 

 on the operating panel.

- 1: Terminal control ("LOCAL/REMOT" indicator on)

  Commands are given by means of multifunctional input terminals with functions such as FWD, REV, JOGF, and JOGR.

- 2: Communication control ("LOCAL/REMOT" indicator blinking)

Parameter No.	Parameter Name	Setting Range	Default
P0-03	Main frequency source X selection	0: Digital setting (non-retentive at power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: AI2 4: AI3 5: Pulse setting (S5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication setting	0

It is used to select the setting channel of the main frequency. You can set the main frequency in the following 10 channels:

- 0: Digital setting (non-retentive at power failure)

  The initial value of the set frequency is the value of P0-08 (Preset frequency). You can change the set frequency by pressing  and  on the operating panel (or using the UP/DOWN function of input terminals).

  When the AC drive is powered on again after power failure, the set frequency reverts to the value of P0-08.

- 1: Digital setting (retentive at power failure)

  The initial value of the set frequency is the value of P0-08 (Preset frequency). You can change the set frequency by pressing keys  and  on the operating panel (or using the UP/DOWN function of input terminals).

  When the AC drive is powered on again after power failure, the set frequency is the value memorized at the moment of the last power failure.

  Note that P0-23 (Retentive of digital setting frequency upon power failure) determines whether the set frequency is memorized or cleared when the AC drive stops. It is related to stop rather than power failure.

- 2: AI1 (0–10 V voltage input)

- 6: Multi-reference

  In multi-reference mode, combinations of different DI terminal states correspond to different set frequencies. The EV200 supports a maximum of 16 speeds implemented by 16 state combinations of four DI terminals (allocated with functions 12 to 15) in Group PC. The multiple references indicate percentages of the value of P0-10 (Maximum frequency)

  If a DI terminal is used for the multi-reference function, you need to perform related setting in group P4.

- 7: Simple PLC

  When the simple programmable logic controller (PLC) mode is used as the frequency source, the running frequency of the AC drive can be switched over among the 16 frequency references. You can set the holding time and acceleration/deceleration time of the 16 frequency references. For details, refer to the descriptions of Group PC.

- 8: PID

  The output of PID control is used as the running frequency. PID control is generally used in on-site closed-loop control, such as constant pressure closed-loop control and constant tension closed-loop control.

  When applying PID as the frequency source, you need to set parameters of PID function in group PA.

- 9: Communication setting

Parameter No.	Parameter Name	Setting Range	Default
P0-04	Auxiliary frequency source B selection	0: Digital setting (non-retentive at power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: AI2 4: AI3 5: Pulse setting (S5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication setting	0

When used as an independent frequency input channel (frequency source switched over from A to B), the auxiliary frequency source B is used in the same way as the main frequency source A (refer to P0-03).

When the auxiliary frequency source is used for operation (frequency source is "A and B operation"), pay attention to the following aspects:

1) If the auxiliary frequency source B is digital setting, the preset frequency (P0-08) does not take effect. You can directly adjust the set main frequency by pressing keys and *on the operating panel (or using the UP/DOWN function of input terminals).*

2) If the auxiliary frequency source is analog input (AI1) setting,
100% of the input corresponds to the range of the auxiliary frequency B (set in P0-05 and P0-06).

Note

The main frequency source X and auxiliary frequency source Y must not use the same channel.
That is, P0-03 and P0-04 cannot be set to the same value.

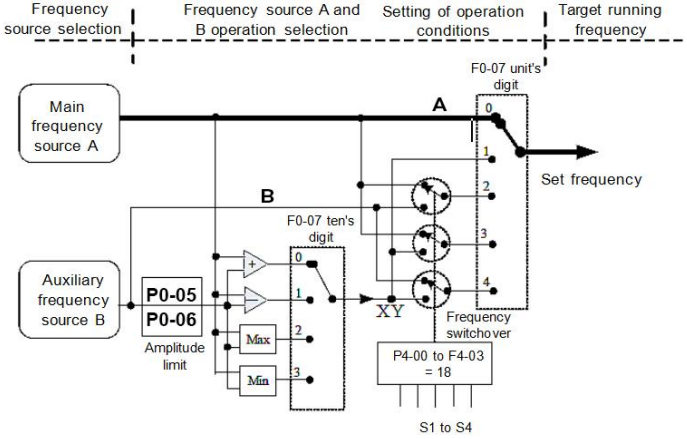
Parameter No.	Parameter Name	Setting Range	Default
P0-05	Auxiliary frequency source B Reference object selection	0: Relative to maximum frequency 1: Relative to main frequency A	0
P0-06	Auxiliary frequency source B command	0%–150%	0

If A and B operation is used, P0-05 and P0-06 are used to set the adjustment range of the auxiliary frequency source.

Parameter No.	Parameter Name	Setting Range	Default
P0-07	Frequency source selection	Ones position (Frequency source selection) 0: Main frequency source A 1: A and B operation (operation relationship determined by Tens position) 2: Switchover between A and B 3: Switchover between A and "A and B operation" 4: Switchover between A and "A and B operation" Tens position (A and B operation relationship) 0: 主+辅 1: 主-辅 2: Maximum 3: Minimum	0

It is used to select the frequency setting channel. If the frequency source involves A and B operation, you can set the frequency offset in P0-21 for superposition to the A and B operation result, flexibly satisfying various requirements.

Figure 10-1 Frequency setting based on main frequency source A and auxiliary frequency source B



Parameter No.	Parameter Name	Setting Range	Default
P0-08	Preset frequency	0.00 to maximum frequency (valid when frequency source is digital setting)	50 Hz

If the frequency source is digital setting or terminal UP/DOWN, the value of this parameter is the initial frequency of the AC drive (digital setting).

Parameter No.	Parameter Name	Setting Range	Default
P0-09	Rotation direction	0: Same direction 1: Reverse direction	0

You can change the rotation direction of the motor just by modifying this parameter without changing the motor wiring. Modifying this parameter is equivalent to exchanging any two of the motor's U, V, W wires.

Note

The motor will resume running in the original direction after parameter initialization. Do not use this function in applications where changing the rotating direction of the motor is prohibited after system commissioning is complete.

Parameter No.	Parameter Name	Setting Range	Default
P0-10	Maximum frequency	50.00–320.00 Hz	50.00 Hz

When the frequency source is AI, pulse setting (S5), or multi-reference, 100% of the input corresponds to the value of this parameter.

The output frequency of the EV200 can reach up to 3200 Hz. To take both frequency reference resolution and frequency input range into consideration, you can set the number of decimal places for frequency reference in P0-22.

- If P0-22 is set to 1, the frequency reference resolution is 0.1 Hz. In this case, the setting range of P0-10 is 50.0 to 3200.0 Hz.
- If P0-22 is set to 2, the frequency reference resolution is 0.01 Hz. In this case, the setting range of P0-10 is 50.00 to 320.00 Hz.

Note

After the value of F0-22 is modified, the frequency resolution of all frequency related parameters change accordingly.

Parameter No.	Parameter Name	Setting Range	Default
P0-11	Source of frequency upper limit	0: Set by F0-12 1: AI1 2: AI2 3: AI3 4: Pulse setting (S5) 5: Communication setting	0

It is used to set the source of the frequency upper limit, including digital setting (P0-12), AI, pulse setting or communication setting. If the frequency upper limit is set by means of AI1, AI2, AI3, S5 or communication, the setting is similar to that of the main frequency source A.

For details, see the description of P0-03.

For example, to avoid runaway in torque control mode in winding application, you can set the frequency upper limit by means of analog input. When the AC drive reaches the upper limit, it will continue to run at this speed.

Parameter No.	Parameter Name	Setting Range	Default
P0-12	Frequency upper limit	Frequency lower limit (P0-14) to maximum frequency (P0-10)	50.00 Hz

This parameter is used to set the frequency upper limit.

Parameter No.	Parameter Name	Setting Range	Default
P0-13	Frequency upper limit offset	0.00 Hz to maximum frequency (P0-10)	0.00 Hz

If the source of the frequency upper limit is analog input or pulse setting, the final frequency upper limit is obtained by adding the offset in this parameter to the frequency upper limit set in F0-11.

Parameter No.	Parameter Name	Setting Range	Default
P0-14	Frequency lower limit	0.00 Hz to frequency upper limit (F0-12)	0.00 Hz

If the frequency reference is lower than the value of this parameter, the AC drive can stop, run at the frequency lower limit, or run at zero speed, determined by P8-14.

Parameter No.	Parameter Name	Setting Range	Default
P0-15	Carrier frequency	0.5–16.0 kHz	Model dependent

It is used to adjust the carrier frequency of the AC drive, helping to reduce the motor noise, avoiding the resonance of the mechanical system, and reducing the leakage current to the earth and interference generated by the AC drive.

If the carrier frequency is low, output current has high harmonics, and the power loss and temperature rise of the motor increase.

If the carrier frequency is high, power loss and temperature rise of the motor declines. However, the AC drive has an increase in power loss, temperature rise and interference.

Adjusting the carrier frequency will exert influences on the aspects listed in the following table.

Table 10-1 Influences of carrier frequency adjustment

Carrier frequency	Low	High
Motor noise	Large	Small
Output current waveform	Bad	Good
Motor temperature rise	High	Low
AC drive temperature rise	Low	High
Leakage current	Small	Large
External radiation interference	Small	Large

The factory setting of carrier frequency varies with the AC drive power. If you need to modify the carrier frequency, note that if the set carrier frequency is higher than factory setting, it will lead to an increase in temperature rise of the AC drive's heatsink. In this case, you need to de-rate the AC drive. Otherwise, the AC drive may overheat and alarm.

Parameter No.	Parameter Name	Setting Range	Default
P0-16	Carrier frequency adjustment with temperature	0: No 1: Yes	1

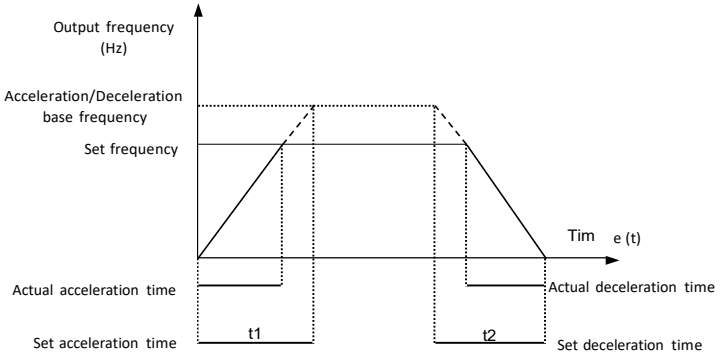
It is used to set whether the carrier frequency is adjusted based on the temperature. The AC drive automatically reduces the carrier frequency when detecting that the heatsink temperature is high. The AC drive resumes the carrier frequency to the set value when the heatsink temperature becomes normal. This function reduces the overheat alarms.

Parameter No.	Parameter Name	Setting Range	Default
P0-17	Acceleration time 1	0.00–650.00s (F0-19 = 2) 0.0–6500.0s (F0-19 = 1) 0–65000s (F0-19 = 0)	Model dependent
P0-18	Deceleration time 1	0.00–650.00s (F0-19 = 2) 0.0–6500.0s (F0-19 = 1) 0–65000s (F0-19 = 0)	Model dependent

Acceleration time indicates the time required by the AC drive to accelerate from 0 Hz to "Acceleration/Deceleration base frequency" (P0-25), that is, t1 in Figure 6-2.

Deceleration time indicates the time required by the AC drive to decelerate from "Acceleration/Deceleration base frequency" (P0-25) to 0 Hz, that is, t2 in Figure 6-2.

Figure 10-2 Acceleration/Deceleration time



The EV200 provides totally four groups of acceleration/deceleration time for selection. You can perform switchover by using a DI terminal.

- Group 1: P0-17, P0-18
- Group 2: P8-03, P8-04
- Group 3: P8-05, P8-06

- Group 4: F8-07, F8-08

Parameter No.	Parameter Name	Setting Range	Default
P0-19	Acceleration/Deceleration time unit	0:1s 1: 0.1s 2: 0.01s	1

To satisfy requirements of different applications, the EV200 provides three acceleration/ deceleration time units, 1s, 0.1s and 0.01s.

Note

Modifying this parameter will make the displayed decimal places change and corresponding acceleration/deceleration time also change.

Parameter No.	Parameter Name	Setting Range	Default
P0-21	Frequency offset of auxiliary frequency setting channel for main and auxiliary calculation	0.00 Hz to maximum frequency (P0-10)	0.00 Hz

This parameter is valid only when the frequency source is set to "A and B operation". The final frequency is obtained by adding the frequency offset set in this parameter to the A and B operation result.

Parameter No.	Parameter Name	Setting Range	Default
P0-22	Frequency reference resolution	1: 0.1 Hz 2: 0.01 Hz	2

It is used to set the resolution of all frequency-related parameters.

Note

- Modifying this parameter will make the decimal places of all frequency-related parameters change and corresponding frequency values change.
- This parameter is not resumed when factory setting is resumed.

Parameter No.	Parameter Name	Setting Range	Default
P0-23	Retentive of digital setting frequency upon stop	0: Not retentive 1: Retentive	0

This parameter is valid only when the frequency source is digital setting.

If P0-23 is set to 0, the digital setting frequency value resumes to the value of P0-08 (Preset frequency) after the AC drive stops. The modification by using keys  and  or the terminal UP/DOWN function is cleared.

If P0-23 is set to 1, the digital setting frequency value is the set frequency at the moment when the AC drive stops. The modification by using keys and or the terminal UP/ DOWN function remains effective.

Parameter No.	Parameter Name	Setting Range	Default
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0

Parameter No.	Parameter Name	Setting Range	Default
P0-25	Acceleration/Deceleration time base frequency	0: Maximum frequency (F0-10) 1: Set frequency 2: 100 Hz	0

The acceleration/deceleration time indicates the time for the AC drive to increase from 0 Hz to the frequency set in P0-25. If this parameter is set to 1, the acceleration/deceleration time is related to the set frequency. If the set frequency changes frequently, the motor's acceleration/deceleration also changes.

Parameter No.	Parameter Name	Setting Range	Default
P0-26	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Set frequency	0

This parameter is valid only when the frequency source is digital setting.

It is used to set the base frequency to be modified by using keys and or the terminal UP/DOWN function. If the running frequency and set frequency are different, there will be a large difference between the AC drive's performance during the acceleration/ deceleration process.

Parameter No.	Parameter Name	Setting Range	Default
P0-27	Binding command source to frequency source	Ones position (Binding operating panel command to frequency source)	000
		0: No binding 1: Frequency source by digital setting 2: AI1 3: AI2 4: AI3 5: Pulse setting (S5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication setting	
		Tens position (Binding terminal command to frequency source)	
		0–9, same as Ones position	
		Hundreds position (Binding communication command to frequency source)	
		0–9, same as Ones position)	

It is used to bind the three running command sources with the nine frequency sources, facilitating to implement synchronous switchover.

For details on the frequency sources, see the description of P0-03 (Main frequency source X selection). Different running command sources can be bound to the same frequency source.

If a command source has a bound frequency source, the frequency source set in P0-03 to P0-07 no longer takes effect when the command source is effective.

Parameter No.	Parameter Name	Setting Range	Default
P0-28	Serial communication protocol	0: Modbus protocol	0

Group F1: Motor 1 Parameters

Parameter No.	Parameter Name	Setting Range	Default
P1-00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0
P1-01	Rated motor power	0.1–1000.0 kW	Model dependent
P1-02	Rated motor voltage	1–2000 V	Model dependent
P1-03	Rated motor current	0.01–655.35 A (AC drive power ≤ 55 kW) 0.1–6553.5 A (AC drive power > 55 kW)	Model dependent
P1-04	Rated motor frequency	0.01 Hz to maximum frequency	Model dependent
P1-05	Rated motor rotational speed	1–65535 RPM	Model dependent

Set the parameters according to the motor nameplate no matter whether V/F control or vector control is adopted.

To achieve better V/F or vector control performance, motor auto-tuning is required. The motor auto-tuning accuracy depends on the correct setting of motor nameplate parameters.

Parameter No.	Parameter Name	Setting Range	Default
P1-06	Stator resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ≤ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent
P1-07	Rotor resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ≤ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent
P1-08	Leakage inductive reactance (asynchronous motor)	0.01–655.35 mH (AC drive power ≤ 55 kW) 0.001–65.535 mH (AC drive power > 55 kW)	Model dependent
P1-09	Mutual inductive reactance (asynchronous motor)	0.1–6553.5 mH (AC drive power ≤ 55 kW) 0.01—655.35 mH (AC drive power > 55 kW)	Model dependent
P1-10	No-load current (asynchronous motor)	0.01 to F1-03 (AC drive power ≤ 55 kW) 0.1 to F1-03 (AC drive power > 55 kW)	Model dependent

The parameters in P1-06 to P-10 are asynchronous motor parameters. These parameters are unavailable on the motor nameplate and are obtained by means of motor auto-tuning. Only P1-06 to P1-08 can be obtained through static motor auto-tuning. Through complete motor auto-tuning, encoder phase sequence and current loop PI can be obtained besides the parameters in P1-06 to P1-10.

Each time "Rated motor power" (P1-01) or "Rated motor voltage" (P1-02) is changed, the AC drive automatically restores values of P1-06 to F1-10 to the parameter setting for the

common standard Y series asynchronous motor.

If it is impossible to perform motor auto-tuning onsite, manually input the values of these parameters according to data provided by the motor manufacturer.

Parameter No.	Parameter Name	Setting Range	Default
F1-27	Encoder pulses per revolution	1–65535	1024

This parameter is used to set the pulses per revolution (PPR) of ABZ . In FVC mode, the motor cannot run properly if this parameter is set incorrectly.

Parameter No.	Parameter Name	Setting Range	Default
P1-28	Encoder type	0: ABZ incremental encoder 2: Resolver	0

Only ABZ incremental encoder and resolver are applicable to asynchronous motor.

After installation of the PG card is complete, set this parameter properly based on the actual condition. Otherwise, the AC drive cannot run properly.

Parameter No.	Parameter Name	Setting Range	Default
P1-30	A/B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0

This parameter is valid only for ABZ incremental encoder (P1-28 = 0) and is used to set the A/B phase sequence of the ABZ incremental encoder.

It is valid for both asynchronous motor and synchronous motor. The A/B phase sequence can be obtained through "Asynchronous motor complete auto-tuning" or "Synchronous motor no-load auto-tuning".

This parameter is applicable only to synchronous motor. It is valid for ABZ incremental encoder, UVW incremental encoder, resolver and wire-saving UVW encoder, but invalid for SIN/COS encoder.

It can be obtained through synchronous motor no-load auto-turning or with-load auto-tuning. After installation of the synchronous motor is complete, the value of this parameter must be obtained by motor auto-tuning. Otherwise, the motor cannot run properly.

Parameter No.	Parameter Name	Setting Range	Default
P1-34	Number of pole pairs of resolver	1–65535	1

If a resolver is applied, set the number of pole pairs properly.

Parameter No.	Parameter Name	Setting Range	Default
P1-36	Encoder wire-break fault detection time	0.0s: No action 0.1–10.0s	0.0s

This parameter is used to set the time that a wire-break fault lasts. If it is set to 0.0s, the AC drive does not detect the encoder wire-break fault. If the duration of the encoder wire-break fault detected by the AC drive exceeds the time set in this parameter, the AC drive reports FU20.

Parameter No.	Parameter Name	Setting Range	Default
P1-37	Auto-tuning selection	0: No auto-tuning 1: Asynchronous motor static auto-tuning 2: Asynchronous motor complete auto-tuning 3:asynchronous machine static complete self-learning	0

- 0: No auto-tuning
  Auto-tuning is prohibited.
- 1: Asynchronous motor static auto-tuning

  It is applicable to scenarios where complete auto-tuning cannot be performed because the asynchronous motor cannot be disconnected from the load.

  Before performing static auto-tuning, properly set the motor type and motor nameplate parameters of F1-00 to F1-05 first. The AC drive will obtain parameters of F1-06 to F1-08 by static auto-tuning.

  Set this parameter to 1, and press RUN. Then, the AC drive starts static auto-tuning.
- 2: Asynchronous motor complete auto-tuning

  To perform this type of auto-tuning, ensure that the motor is disconnected from the load. During the process of complete auto-tuning, the AC drive performs static auto-tuning first and then accelerates to 80% of the rated motor frequency within the acceleration time set in F0-17. The AC drive keeps running for a certain period and then decelerates to stop within deceleration time set in F0-18.

  Before performing complete auto-tuning, properly set the motor type, motor nameplate parameters of F1-00 to F1-05, "Encoder type" (F1-28) and "Encoder pulses per revolution" (F1-27) first.

  The AC drive will obtain motor parameters of F1-06 to F1-10, "A/B phase sequence of ABZ incremental encoder" (F1-30) and vector control current loop PI parameters of F2-13 to F2-16 by complete auto-tuning.

  Set this parameter to 2, and press RUN. Then, the AC drive starts complete auto- tuning.
- 3: asynchronous machine static complete self-learning

Note

Motor auto-tuning can be performed only in operating panel mode.

Group P2: Vector Control Parameters

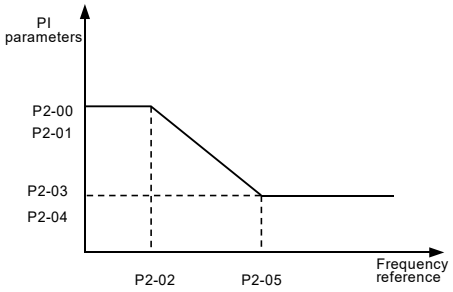
Group P2 is valid for vector control, and invalid for V/F control.

Parameter No.	Parameter Name	Setting Range	Default
P2-00	Speed loop proportional gain 1	0–100	30
P2-01	Speed loop integral time 1	0.01–10.00s	0.50s
P2-02	Switchover frequency 1	0.00 to F2-05	5.00 Hz
P2-03	Speed loop proportional gain 2	0–100	20
P2-04	Speed loop integral time 2	0.01–10.00s	1.00s
P2-05	Switchover frequency 2	F2-02 to maximum output frequency	10.00 Hz

Speed loop PI parameters vary with running frequencies of the AC drive.

- If the running frequency is less than or equal to "Switchover frequency 1" (P2-02), the speed loop PI parameters are P2-00 and P2-01.
- If the running frequency is equal to or greater than "Switchover frequency 2" (P2-05), the speed loop PI parameters are P2-03 and P2-04.
- If the running frequency is between P2-02 and P2-05, the speed loop PI parameters are obtained from the linear switchover between the two groups of PI parameters, as shown in Figure 6-3.

Figure 10-3 Relationship between running frequencies and PI parameters



The speed dynamic response characteristics in vector control can be adjusted by setting the proportional gain and integral time of the speed regulator.

To achieve a faster system response, increase the proportional gain and reduce the integral time. Be aware that this may lead to system oscillation.

The recommended adjustment method is as follows:

If the factory setting cannot meet the requirements, make proper adjustment. Increase the proportional gain first to ensure that the system does not oscillate, and then reduce the integral time to ensure that the system has quick response and small overshoot.

Note

Improper PI parameter setting may cause too large speed overshoot, and overvoltage fault may even occur when the overshoot drops.

Parameter No.	Parameter Name	Setting Range	Default
P2-06	Vector control slip gain	50%–200%	100%

For SVC, it is used to adjust speed stability accuracy of the motor. When the motor with load runs at a very low speed, increase the value of this parameter; when the motor with load runs at a very large speed, decrease the value of this parameter.

For FVC, it is used to adjust the output current of the AC drive with same load.

Parameter No.	Parameter Name	Setting Range	Default
P2-07	Time constant of speed loop filter	0.000–0.100s	0.000s

In the vector control mode, the output of the speed loop regulator is torque current reference. This parameter is used to filter the torque references. It need not be adjusted generally and can be increased in the case of large speed fluctuation. In the case of motor oscillation, decrease the value of this parameter properly.

If the value of this parameter is small, the output torque of the AC drive may fluctuate greatly, but the response is quick.

Parameter No.	Parameter Name	Setting Range	Default
P2-09	Torque upper limit source in speed control mode	0:P2-10 1: AI1 2: AI2 3: AI3 4: Pulse setting (S5) 5: Communication setting	0
P2-10	Digital setting of torque upper limit in speed control mode	0.0%–200.0%	150.0%

In the speed control mode, the maximum output torque of the AC drive is restricted by P2-09. If the torque upper limit is analog, pulse or communication setting, 100% of the setting corresponds to the value of P2-10, and 100% of the value of P2-10 corresponds to the AC drive rated torque.

For details on the AI1, AI2 and AI3 setting, see the description of the AI curves in group F4. For details on the pulse setting, see the description of PP-28 to PP-32.

When the AC drive is in communication with the master, if F2-09 is set to 5 “communication setting”, P2-10 “Digital setting of torque upper limit in speed control mode” can be set via communication from the master.

In other conditions, the host controller writes data -100.00% to 100.00% by the communication address 0x1000, where 100.0% corresponds to the value of P2-10. The communication protocol can be Modbus.

Parameter No.	Parameter Name	Setting Range	Default
P2-13	Excitation adjustment proportional gain	0–20000	2000
P2-14	Excitation adjustment integral gain	0–20000	1300
P2-15	Torque adjustment proportional gain	0–20000	2000
P2-16	Torque adjustment integral gain	0–20000	1300

These are current loop PI parameters for vector control. These parameters are automatically obtained through "Asynchronous motor complete auto-tuning" or "Synchronous motor no- load auto-tuning", and need not be modified.

The dimension of the current loop integral regulator is integral gain rather than integral time. Note that too large current loop PI gain may lead to oscillation of the entire control loop. Therefore, when current oscillation or torque fluctuation is great, manually decrease the proportional gain or integral gain here.

Parameter No.	Parameter Name	Setting Range	Default
P2-17	Speed loop integral separation selection	0: Disabled 1: Enabled	0
P2-19	Field weakening depth of synchronous motor	50%–500%	100%
P2-20	Max output voltage	1%–300%	50%
P2-21	Max. torque coefficient of field weakening area	50~200%	100%
P2-22	Regenerative power limit selection	0: Disabled 1: Enabled	0
P2-23	Regenerative power limit	0~200%	Model

For applications such as CAM load, rapid acceleration and deceleration, and load sudden discharge, and when no brake resistance is used, power generation can be enabled

Rate limit (set P2-22=1), effectively reduce the bus voltage overshoot during the motor braking process, to avoid the occurrence of over voltage fault. Generating capacity

The upper limit P2-23 is the percentage of the rated power of the motor, which still occurs when the generation power limit is enabled. In case of over pressure, turn P2-23 downward adjust.

Group P3: V/F Control Parameters

Group F3 is valid only for V/F control.

The V/F control mode is applicable to low load applications (fan or pump) or applications where one AC drive operates multiple motors or there is a large difference between the AC drive power and the motor power.

Parameter No.	Parameter Name	Setting Range	Default
P3-00	V/F curve setting	0: Linear V/F 1: Multi-point V/F 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: V/F complete separation 11: V/F half separation	0

- 0: Linear V/F

  It is applicable to common constant torque load.

- 1: Multi-point V/F

  It is applicable to special load such as dehydrator and centrifuge. Any such V/F curve can be obtained by setting parameters of P3-03 to P3-08.

- 2: Square V/F

  It is applicable to centrifugal loads such as fan and pump.

- 3 to 8: V/F curve between linear V/F and square V/F

- 10: V/F complete separation

  In this mode, the output frequency and output voltage of the AC drive are independent. The output frequency is determined by the frequency source, and the output voltage is determined by "Voltage source for V/F separation" (P3-13).

  It is applicable to induction heating, inverse power supply and torque motor control.

- 11: V/F half separation

  In this mode, V and F are proportional and the proportional relationship can be set in P3-13. The relationship between V and F are also related to the rated motor voltage and rated motor frequency in Group P1.

  Assume that the voltage source input is X (0 to 100%), the relationship between V and F is:

  V/F = 2 x X x (Rated motor voltage)/(Rated motor frequency)

Parameter No.	Parameter Name	Setting Range	Default
P3-01	Torque boost	0.0%–30%	Model dependent
P3-02	Cut-off frequency of torque boost	0.00 Hz to maximum output frequency	50.00 Hz

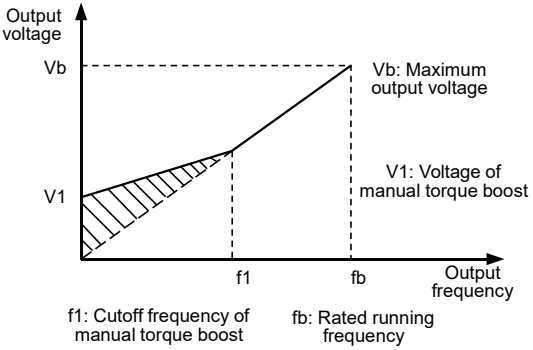
To compensate the low frequency torque characteristics of V/F control, you can boost the output voltage of the AC drive at low frequency by modifying P3-01.

If the torque boost is set to too large, the motor may overheat, and the AC drive may suffer over current.

If the load is large and the motor startup torque is insufficient, increase the value of P3-01. If the load is small, decrease the value of P3-01. If it is set to 0.0, the AC drive performs automatic torque boost. In this case, the AC drive automatically calculates the torque boost value based on motor parameters including the stator resistance.

P3-02 specifies the frequency under which torque boost is valid. Torque boost becomes invalid when this frequency is exceeded, as shown in the following figure.

Figure 10-4 Manual torque boost



Parameter No.	Parameter Name	Setting Range	Default
P3-03	Multi-point V/F frequency 1 (F1)	0.00 Hz to P3-05	0.00 Hz
P3-04	Multi-point V/F voltage 1 (V1)	0.0%–100.0%	0.0%
P3-05	Multi-point V/F frequency 2 (F2)	P3-03 to P3-07	0.00 Hz
P3-06	Multi-point V/F voltage 2 (V2)	0.0%–100.0%	0.0%
P3-07	Multi-point V/F frequency 3 (F3)	P3-05 to rated motor frequency (P1-04)	0.00 Hz
P3-08	Multi-point V/F voltage 3 (V3)	0.0%–100.0%	0.0%

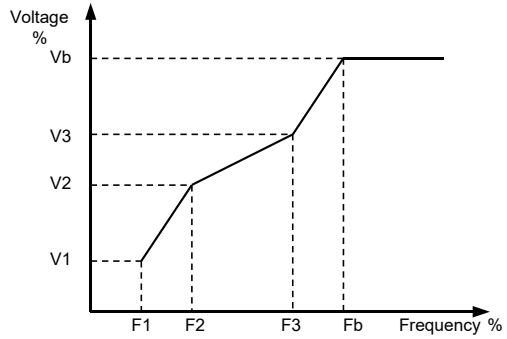
These six parameters are used to define the multi-point V/F curve.

The multi-point V/F curve is set based on the motor's load characteristic. The relationship between voltages and frequencies is:

V1 < V2 < V3, F1 < F2 < F3

At low frequency, higher voltage may cause overheat or even burnt out of the motor and overcurrent stall or overcurrent protection of the AC drive.

Figure 10-5 Setting of multi-point V/F curve



V1-V3: 1st, 2nd and 3rd voltage percentages of multi-point V/F

F1-F3: 1st, 2nd and 3rd frequency percentages of multi-point V/F

Vb: Rated motor voltage

Fb: Rated motor running frequency

Parameter No.	Parameter Name	Setting Range	Default
P3-09	V/F slip compensation gain	0%–200.0%	0.0%

This parameter is valid only for the asynchronous motor.

It can compensate the rotational speed slip of the asynchronous motor when the load of the motor increases, stabilizing the motor speed in case of load change. If this parameter is set to 100%, it indicates that the compensation when the motor bears rated load is the rated motor slip. The rated motor slip is automatically obtained by the AC drive through calculation based on the rated motor frequency and rated motor rotational speed in group F1.

Generally, if the motor rotational speed is different from the target speed, slightly adjust this parameter.

Parameter No.	Parameter Name	Setting Range	Default
P3-10	V/F over-excitation gain	0–200	64

During deceleration of the AC drive, over-excitation can restrain rise of the bus voltage, preventing the over voltage fault. The larger the over-excitation is, the better the restraining result is.

Increase the over-excitation gain if the AC drive is liable to overvoltage error during deceleration. However, too large over-excitation gain may lead to an increase in the output current. Set P3-09 to a proper value in actual applications.

Set the over-excitation gain to 0 in the applications where the inertia is small and the bus voltage will not rise during motor deceleration or where there is a braking resistor.

Parameter No.	Parameter Name	Setting Range	Default
P3-11	V/F oscillation suppression gain	0–100	Model dependent

Set this parameter to a value as small as possible in the prerequisite of efficient oscillation suppression to avoid influence on V/F control.

Set this parameter to 0 if the motor has no oscillation. Increase the value properly only when the motor has obvious oscillation. The larger the value is, the better the oscillation suppression result will be.

When the oscillation suppression function is enabled, the rated motor current and no- load current must be correct. Otherwise, the V/F oscillation suppression effect will not be satisfactory.

Parameter No.	Parameter Name	Setting Range	Default
P3-13	Voltage source for V/F separation	0: Digital setting (F3-14) 1: AI1 2: AI2 3: AI3 4: Pulse setting (S5) 5: Multi-reference 6: Simple PLC 7: PID 8: Communication setting 100.0% corresponds to the rated motor voltage	0
P3-14	Voltage digital setting for V/F separation	0 V to rated motor voltage	0 V

V/F separation is generally applicable to scenarios such as induction heating, inverse power supply and motor torque control.

If V/F separated control is enabled, the output voltage can be set in F3-14 or by means of analog, multi-reference, simple PLC, PID or communication. If you set the output voltage by means of non-digital setting, 100% of the setting corresponds to the rated motor voltage. If a negative percentage is set, its absolute value is used as the effective value.

- 0: Digital setting (P3-14)

  The output voltage is set directly in P3-14.

- 1: AI1; 2: AI2; 3: AI3

  The output voltage is set by AI terminals.

- 4: Pulse setting (S5)

  The output voltage is set by pulses of the terminal S5.

  Pulse setting specification: voltage range 9–30 V, frequency range 0–100 kHz

- 5: Multi-reference

  If the voltage source is multi-reference, parameters in group F4 and PC must be set to determine the corresponding relationship between setting signal and setting voltage. 100.0% of the multi-reference setting in group PC corresponds to the rated motor voltage.

- 6: Simple PLC

  If the voltage source is simple PLC mode, parameters in group PC must be set to determine the setting output voltage.

- 7: PID

The output voltage is generated based on PID closed loop. For details, see the description of PID in group PA.

- 8: Communication setting

The output voltage is set by the host controller by means of communication.

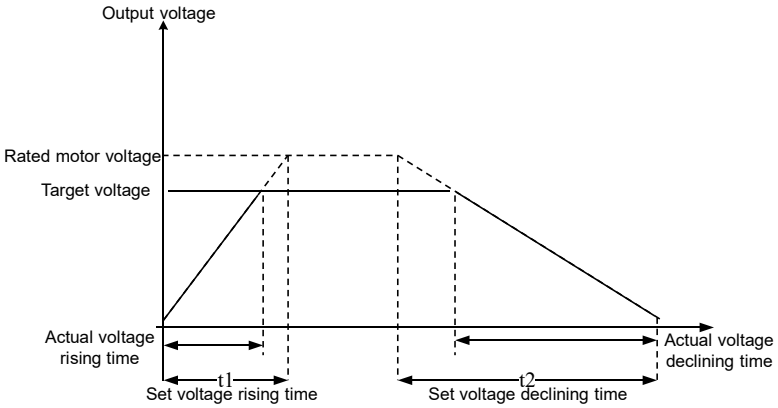
The voltage source for V/F separation is set in the same way as the frequency source. For details, see P0-03. 100.0% of the setting in each mode corresponds to the rated motor voltage. If the corresponding value is negative, its absolute value is used.

Parameter No.	Parameter Name	Setting Range	Default
P3-15	Voltage rise time of V/F separation	0.0–1000.0s	0.0s
P3-16	Voltage decline time of V/F separation	0.0–1000.0s	0.0s

P3-15 indicates the time required for the output voltage to rise from 0 V to the rated motor voltage shown as t1 in the following figure.

P3-16 indicates the time required for the output voltage to decline from the rated motor voltage to 0 V, shown as t2 in the following figure.

Figure 10-6 Voltage of V/F separation



Group P4: Input Terminals

The EV200 provides four DI terminals and one analog input (AI) terminals.

Parameter No.	Parameter Name	Default	Remark
P4-00	S1 function selection	1: Forward RUN (FWD)	Standard

Parameter No.	Parameter Name	Default	Remark
P4-01	S2 function selection	4: Forward JOG (FJOG)	Standard
P4-02	S3 function selection	9: Fault reset (RESET)	Standard
P4-03	S4 function selection	12: Multi-reference terminal 1	Standard

The following table lists the functions available for the S terminals.

Table 10-2 Functions of DI terminals

Value	Function	Description
0	No function	Set 0 for reserved terminals to avoid malfunction.
1	Forward RUN (FWD)	The terminal is used to control forward or reverse RUN of the AC drive.
2	Reverse RUN (REV)	
3	Three-line control	The terminal determines three-line control of the AC drive. For details, see the description of P4-11.
4	Forward JOG (FJOG)	FJOG indicates forward JOG running, while RJOG indicates reverse JOG running. The JOG frequency, acceleration time and deceleration time are described respectively in P8-00, P8-01 and P8-02.
5	Reverse JOG (RJOG)	
6	Terminal UP	If the frequency is determined by external terminals, the terminals with the two functions are used as increment and decrement commands for frequency modification. When the frequency source is digital setting, they are used to adjust the frequency.
7	Terminal DOWN	
8	Coast to stop	The AC drive blocks its output, the motor coasts to rest and is not controlled by the AC drive. It is the same as coast to stop described in P6-10.
9	Fault reset (RESET)	The terminal is used for fault reset function, the same as the function of RESET key on the operating panel. Remote fault reset is implemented by this function.
10	RUN pause	The AC drive decelerates to stop, but the running parameters are all memorized, such as PLC, swing frequency and PID parameters. After this function is disabled, the AC drive resumes its status before stop.
11	Normally open (NO) input of external fault	If this terminal becomes ON, the AC drive reports FU15 and performs the fault protection action. For more details, see the description of P9-47.

Value	Function	Description
12	Multi-reference terminal 1	The setting of 16 speeds or 16 other references can be implemented through combinations of 16 states of these four terminals.
13	Multi-reference terminal 2	
14	Multi-reference terminal 3	
15	Multi-reference terminal 4	
16	Terminal 1 for acceleration/ deceleration time selection	Totally four groups of acceleration/deceleration time can be selected through combinations of two states of these two terminals.
17	Terminal 2 for acceleration/ deceleration time selection	
18	Frequency source switchover	The terminal is used to perform switchover between two frequency sources according to the setting in P0-07.
19	UP and DOWN setting clear (terminal, operating panel)	If the frequency source is digital setting, the terminal is used to clear the modification by using the UP/ DOWN function or the increment/decrement key on the operating panel, returning the set frequency to the value of P0-08.
20	Command source switchover terminal	If the command source is set to terminal control (P0-02 = 1), this terminal is used to perform switchover between terminal control and operating panel control. If the command source is set to communication control (P0-02 = 2), this terminal is used to perform switchover between communication control and operating panel control.
21	Acceleration/Deceleration prohibited	It enables the AC drive to maintain the current frequency output without being affected by external signals (except the STOP command).
22	PID pause	PID is invalid temporarily. The AC drive maintains the current frequency output without supporting PID adjustment of frequency source.
23	PLC status reset	The terminal is used to restore the original status of PLC control for the AC drive when PLC control is started again after a pause.
24	Swing pause	The AC drive outputs the central frequency, and the swing frequency function pauses.
25	Counter input	This terminal is used to count pulses.
26	Counter reset	This terminal is used to clear the counter status.
27	Length count input	This terminal is used to count the length.
28	Length reset	This terminal is used to clear the length.
29	Torque control prohibited	The AC drive is prohibited from torque control and enters the speed control mode.
30	Reserved	Reserved
31	Reserved	Reserved.
32	Immediate DC braking	After this terminal becomes ON, the AC drive directly switches over to the DC braking state.

Value	Function	Description
33	Normally closed (NC) input of external fault	After this terminal becomes ON, the AC drive reports FU15 and stops.
34	Frequency modification forbidden	After this terminal becomes ON, the AC drive does not respond to any frequency modification.
35	Reverse PID action direction	After this terminal becomes ON, the PID action direction is reversed to the direction set in PA-03.
36	External STOP terminal 1	In operating panel mode, this terminal can be used to stop the AC drive, equivalent to the function of the STOP key on the operating panel.
37	Command source switchover terminal 2	It is used to perform switchover between terminal control and communication control. If the command source is terminal control, the system will switch over to communication control after this terminal becomes ON.
38	PID integral pause	After this terminal becomes ON, the integral adjustment function pauses. However, the proportional and differentiation adjustment functions are still valid.
39	Switchover between frequency source A and preset frequency	After this terminal becomes ON, the frequency source A is replaced by the preset frequency set in P0-08.
40	Switchover between frequency source B and preset frequency	After this terminal is enabled, the frequency source B is replaced by the preset frequency set in P0-08.
41	Motor selection terminal 1	
42	Reserve	
43	PID parameter switchover	If the PID parameters switchover performed by means of DI terminal (PA-18 = 1), the PID parameters are PA-05 to PA-07 when the terminal becomes OFF; the PID parameters are FA-15 to PA-17 when this terminal becomes ON.
44	User-defined fault 1	If these two terminals become ON, the AC drive reports FU27 and Err28 respectively, and performs fault protection actions based on the setting in P9-49.
45	User-defined fault 2	
46	Speed control/Torque control switchover	This terminal enables the AC drive to switch over between speed control and torque control. When this terminal becomes OFF, the AC drive runs in the mode set in A0-00. When this terminal becomes ON, the AC drive switches over to the other control mode.
47	Emergency stop	When this terminal becomes ON, the AC drive stops within the shortest time. During the stop process, the current remains at the set current upper limit. This function is used to satisfy the requirement of stopping the AC drive in emergency state.

Value	Function	Description
48	External STOP terminal 2	In any control mode (operating panel, terminal or communication), it can be used to make the AC drive decelerate to stop. In this case, the deceleration time is deceleration time 4.
49	Deceleration DC braking	When this terminal becomes ON, the AC drive decelerates to the initial frequency of stop DC braking and then switches over to DC braking state.
50	Clear the current running time	When this terminal becomes ON, the AC drive's current running time is cleared. This function must be supported by P8-42 and P8-53.
51	Switchover between two-line mode and three-line mode	It is used to perform switchover between two-line control and three-line control. If P4 -11 is set to Two-line mode 1, the system switches over to three-line mode 1 when the DI allocated with this function becomes ON
52	Reverse frequency disabled	Reverse frequency disabled

The four multi-reference terminals have 16 state combinations, corresponding to 16 reference values, as listed in the following table.

Table 10-3 State combinations of the four multi-reference terminals

K4	K3	K2	K1	Reference Setting	Corresponding Parameter
OFF	OFF	OFF	OFF	Reference 0	PC-00
OFF	OFF	OFF	ON	Reference 1	PC-01
OFF	OFF	ON	OFF	Reference 2	PC-02
OFF	OFF	ON	ON	Reference 3	PC-03
OFF	ON	OFF	OFF	Reference 4	PC-04
OFF	ON	OFF	ON	Reference 5	PC-05
OFF	ON	ON	OFF	Reference 6	PC-06
OFF	ON	ON	ON	Reference 7	PC-07
ON	OFF	OFF	OFF	Reference 8	PC-08
ON	OFF	OFF	ON	Reference 9	PC-09
ON	OFF	ON	OFF	Reference 10	PC-10
ON	OFF	ON	ON	Reference 11	PC-11
ON	ON	OFF	OFF	Reference 12	PC-12
ON	ON	OFF	ON	Reference 13	PC-13
ON	ON	ON	OFF	Reference 14	PC-14
ON	ON	ON	ON	Reference 15	PC-15

If the frequency source is multi-reference, the value 100% of PC-00 to PC-15 corresponds to the value of P0-10 (Maximum frequency).

Besides the multi-speed function, the multi-reference can be also used as the PID setting source or the voltage source for V/F separation, satisfying the requirement on switchover of different setting values.

Two terminals for acceleration/deceleration time selection have four state combinations, as listed in the following table.

Table 10-4 State combinations of two terminals for acceleration/deceleration time selection

Terminal 2	Terminal 1	Acceleration/Deceleration Time Selection	Corresponding Parameters
OFF	OFF	Acceleration/Deceleration time 1	P0-17, P0-18
OFF	ON	Acceleration/Deceleration time 2	P8-03, P8-04
ON	OFF	Acceleration/Deceleration time 3	P8-05, P8-06
ON	ON	Acceleration/Deceleration time 4	P8-07, P8-08

Parameter No.	Parameter Name	Setting Range	Default
P4-10	S filter time	0.000–1.000s	0.010s

It is used to set the software filter time of S terminal status. If S terminals are liable to interference and may cause malfunction, increase the value of this parameter to enhance the anti-interference capability. However, increase of S filter time will reduce the response of S terminals.

Parameter No.	Parameter Name	Setting Range	Default
P4-11	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0

This parameter is used to set the mode in which the AC drive is controlled by external terminals. The following uses S1, S2 and S3 among S1 to S4 as an example, with allocating functions of S1, S2 and S3 by setting P4-00 to P4-02.

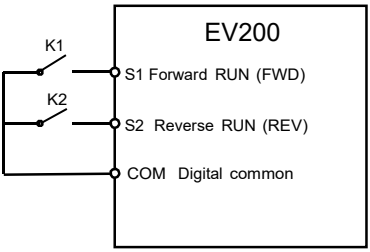
- 0: Two-line mode 1

  It is the most commonly used two-line mode, in which the forward/reverse rotation of the motor is decided by S1 and S2. The parameters are set as below:

Parameter No.	Parameter Name	Value	Function Description
P4-11	Terminal command mode	0	Two-line 1
P4-00	S1 function selection	1	Forward RUN (FWD)
P4-01	S2 function selection	2	Reverse RUN (REV)

Figure 10-7 Setting of two-line mode 1

K1	K2	RUN command
1	0	Forward RUN
0	1	Reverse RUN
1	1	Stop
0	0	Stop



As shown in the preceding figure, when only K1 is ON, the AC drive instructs forward rotation. When only K2 is ON, the AC drive instructs reverse rotation. When K1 and K2 are ON or OFF simultaneously, the AC drive stops.

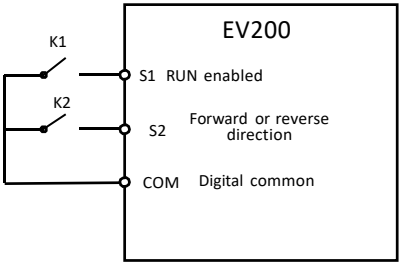
- 1: Two-line mode 2

In this mode, S1 is RUN enabled terminal, and S2 determines the running direction. The parameters are set as below:

Parameter No.	Parameter Name	Value	Function Description
P4-11	Terminal command mode	1	Two-line 2
P4-00	S1 function selection	1	RUN enabled
P4-01	S2 function selection	2	Forward or reverse direction

Figure10-8 Setting of two-line mode 2

K1	K2	RUN command
1	0	Forward RUN
1	1	Reverse RUN
0	0	Stop
0	1	Stop



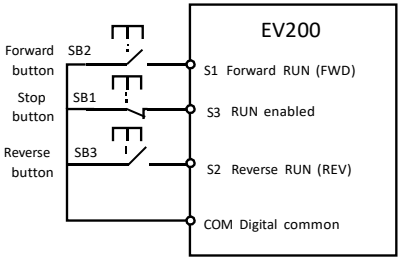
As shown in the preceding figure, if K1 is ON, the AC drive instructs forward rotation when K2 is OFF, and instructs reverse rotation when K2 is ON. If K1 is OFF, the AC drive stops.

- 2: Three-line mode 1

In this mode, S3 is RUN enabled terminal, and the direction is decided by S1 and S2. The parameters are set as below:

Parameter No.	Parameter Name	Value	Function Description
P4-11	Terminal command mode	2	Three-line 1
P4-00	S1 function selection	1	Forward RUN (FWD)
P4-01	S2 function selection	2	Reverse RUN (REV)
P4-02	S3 function selection	3	Three-line control

Figure 10-9 Setting of three-line mode 1



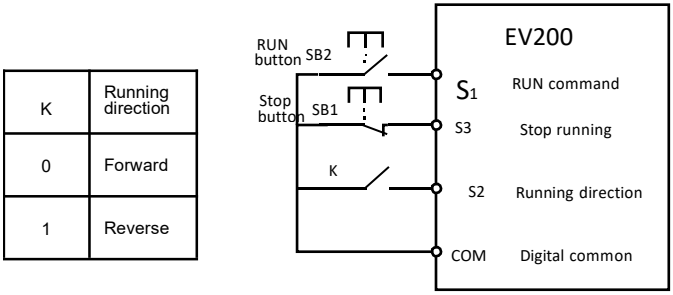
As shown in the preceding figure, if SB1 is ON, the AC drive instructs forward rotation when SB2 is pressed to be ON and instructs reverse rotation when SB3 is pressed to be ON. The AC drive stops immediately after SB1 becomes OFF. During normal startup and running, SB1 must remain ON. The AC drive's running state is determined by the final actions on SB1, SB2 and SB3.

- 3: Three-line mode 2

In this mode, S3 is RUN enabled terminal. The RUN command is given by S1 and the direction is decided by S2. The parameters are set as below:

Parameter No.	Parameter Name	Value	Function Description
P4-11	Terminal command mode	3	Three-line 2
P4-00	S1 function selection	1	RUN enabled
P4-01	S2 function selection	2	Forward or reverse direction
P4-02	S3 function selection	3	Three-line control

Figure 10-10 Setting of three-line mode 2



As shown in the preceding figure, if SB1 is ON, the AC drive starts running when SB2 is pressed to be ON; the AC drive instructs forward rotation when K is OFF and instructs reverse rotation when K is ON. The AC drive stops immediately after SB1 becomes OFF. During normal startup and running, SB1 must remain ON. The AC drive's running

state is determined by the final actions of SB1, SB2 and K.

Parameter No.	Parameter Name	Setting Range	Default
P4-12	Terminal UP/DOWN rate	0.01–65.535 Hz/s	1.00 Hz/s

It is used to adjust the rate of change of frequency when the frequency is adjusted by means of terminal UP/DOWN.

- If P0-22 (Frequency reference resolution) is 2, the setting range is 0.001–65.535 Hz/s.
- If P0-22 (Frequency reference resolution) is 1, the setting range is 0.01–655.35 Hz/s.

Parameter No.	Parameter Name	Setting Range	Default
P4-13	AI curve 1 minimum input	0.00 V toP4-15	0.00 V
P4-14	Corresponding setting of AI curve 1 minimum input	-100.00%–100.0%	0.0%
P4-15	AI curve 1 maximum input	P4-13 to 10.00 V	10.00 V
P4-16	Corresponding setting of AI curve 1 maximum input	-100.00%–100.0%	100.0%
P4-17	AI1 filter time	0.00–10.00s	0.10s

These parameters are used to define the relationship between the analog input voltage and the corresponding setting. When the analog input voltage exceeds the maximum value (P4-15), the maximum value is used.

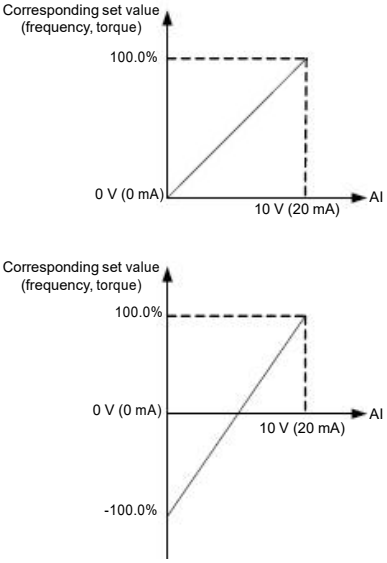
When the analog input is current input, 1 mA current corresponds to 0.5 V voltage.

P4-17 (AI1 filter time) is used to set the software filter time of AI1. If the analog input is liable to interference, increase the value of this parameter to stabilize the detected analog input. However, increase of the AI filter time will slow the response of analog detection. Set this parameter properly based on actual conditions.

In different applications, 100% of analog input corresponds to different nominal values. For details, refer to the description of different applications.

Two typical setting examples are shown in the following figure.

Figure 10-11 Corresponding relationship between analog input and set values



Parameter No.	Parameter Name	Setting Range	Default
P4-35	DI1 delay time	0.0–3600.0s	0.0s
P4-36	DI2 delay time	0.0–3600.0s	0.0s
P4-37	DI3 delay time	0.0–3600.0s	0.0s

These parameters are used to set the delay time of the AC drive when the status of DI terminals changes.

Currently, only S1, S2 and S3 support the delay time function.

Parameter No.	Parameter Name	Setting Range	Default
P4-38	S1-S4 valid mode selection 1	Ones position (S1 valid mode)	00000
		0: High level valid 1: Low level valid	
		Tens position (S2 valid mode)	
		0, 1 (same as S1)	
		Hundreds position (S3 valid mode)	
		0, 1 (same as S1)	
		Thousands position (S4 valid mode)	
		0, 1 (same as S1)	

Group P5: Output Terminals

The EV200 provides a relay terminal as standard.

Parameter No.	Parameter Name	Default
P5-02	Relay function (T/A-T/B-T/C)	2

These five parameters are used to select the functions of the five digital output terminals. T/A-T/B-T/C and P/A-P/B-P/C are respectively the relays on the control board and the extension card.

The functions of the output terminals are described in the following table.

Table 10-5 Functions of output terminals

Value	Function	Description
0	No output	The terminal has no function.
1	AC drive running	When the AC drive is running and has output frequency (can be zero), the terminal becomes ON.
2	Fault output (stop)	When the AC drive stops due to a fault, the terminal becomes ON.
3	Frequency-level detection FDT1 output	Refer to the descriptions of P8-19 and P8-20.
4	Frequency reached	Refer to the descriptions of P8-21.
5	Zero-speed running (no output at stop)	If the AC drive runs with the output frequency of 0, the terminal becomes ON. If the AC drive is in the stop state, the terminal becomes OFF.
6	Motor overload pre-warning	The AC drive judges whether the motor load exceeds the overload pre-warning threshold before performing the protection action. If the pre-warning threshold is exceeded, the terminal becomes ON. For motor overload parameters, see the descriptions of P9-00 to P9-02.
7	AC drive overload pre-warning	The terminal becomes ON 10s before the AC drive overload protection action is performed.
8	Set count value reached	The terminal becomes ON when the count value reaches the value set in Pb-08.
9	Designated count value reached	The terminal becomes ON when the count value reaches the value set in Pb-09.
10	Length reached	The terminal becomes ON when the detected actual length exceeds the value set in Pb-05.
11	PLC cycle complete	When simple PLC completes one cycle, the terminal outputs a pulse signal with width of 250 ms.
12	Accumulative running time reached	If the accumulative running time of the AC drive exceeds the time set in P8-17, the terminal becomes ON.

Value	Function	Description
13	Frequency limited	If the set frequency exceeds the frequency upper limit or lower limit and the output frequency of the AC drive reaches the upper limit or lower limit, the terminal becomes ON.
14	Torque limited	In speed control mode, if the output torque reaches the torque limit, the AC drive enters the stall protection state and meanwhile the terminal becomes ON.
15	Ready for RUN	If the AC drive main circuit and control circuit become stable, and the AC drive detects no fault and is ready for RUN, the terminal becomes ON.
16	AI1 larger than AI2	When the input of AI1 is larger than the input of AI2, the terminal becomes ON.
17	Frequency upper limit reached	If the running frequency reaches the upper limit, the terminal becomes ON.
18	Frequency lower limit reached (no output at stop)	If the running frequency reaches the lower limit, the terminal becomes ON. In the stop state, the terminal becomes OFF.
19	Undervoltage state output	If the AC drive is in undervoltage state, the terminal becomes ON.
20	Communication setting	Refer to the communication protocol.
21	Reserved	Reserved.
22	Reserved	Reserved.
23	Zero-speed running 2 (having output at stop)	If the output frequency of the AC drive is 0, the terminal becomes ON. In the state of stop, the signal is still ON.
24	Accumulative power- on time reached	If the AC drive accumulative power-on time (F7-13) exceeds the value set in F8-16, the terminal becomes ON.
25	Frequency level detection FDT2 output	Refer to the descriptions of P8-28 and P8-29.
26	Frequency 1 reached	Refer to the descriptions of P8-30 and P8-31.
27	Frequency 2 reached	Refer to the descriptions of P8-32 and P8-33.
28	Current 1 reached	Refer to the descriptions of P8-38 and P8-39.
29	Current 2 reached	Refer to the descriptions of P8-40 and P8-41.
30	Timing reached	If the timing function (P8-42) is valid, the terminal becomes ON after the current running time of the AC drive reaches the set time.
31	AI1 input limit exceeded	If AI1 input is larger than the value of F8-46 (AI1 input voltage upper limit) or lower than the value of F8-45 (AI1 input voltage lower limit), the terminal becomes ON.
32	underload	If the load is in the underload state, the terminal becomes ON.
33	Reverse running	If the AC drive is in the reverse running state, the terminal becomes ON.
34	Zero current state	Refer to the descriptions of P8-28 and P8-29.

Value	Function	Description
35	IGBT temperature reached	
36	Software current limit exceeded	Refer to the descriptions of P8-36 and P8-37.
37	Frequency lower limit reached (having output at stop)	If the running frequency reaches the lower limit, the terminal becomes ON. In the stop state, the signal is still ON.
38	Alarm output	If a fault occurs on the AC drive and the AC drive continues to run, the terminal outputs the alarm signal.
39	Motor overheat warning	If the motor temperature reaches the temperature set in P9-58 (Motor overheat warning threshold), the terminal becomes ON. You can view the motor temperature by using d0-34.
40	Current running time reached	If the current running time of AC drive exceeds the value of P8-53, the terminal becomes ON.
41	Fault output	Fault output (a free-stop fault and no output under voltage)

Group P6: Start/Stop Control

Parameter No.	Parameter Name	Setting Range	Default
P6-00	Start mode	0: Direct start 1: Rotational speed tracking restart 2: Pre-excited start (asynchronous motor) 3:SVC quick start	0

- 0: Direct start
  - If the DC braking time is set to 0, the AC drive starts to run at the startup frequency.
  - If the DC braking time is not 0, the AC drive performs DC braking first and then starts to run at the startup frequency. It is applicable to small-inertia load application where the motor is likely to rotate at startup.

- 1: Rotational speed tracking restart

  The AC drive judges the rotational speed and direction of the motor first and then starts at the tracked frequency. Such smooth start has no impact on the rotating motor. It is applicable to the restart upon instantaneous power failure of large-inertia load. To ensure the performance of rotational speed tracking restart, set the motor parameters in group P1 correctly.

- 2: Pre-excited start (asynchronous motor)

  It is valid only for asynchronous motor and used for building the magnetic field before the motor runs. For pre-excited current and pre-excited time, see parameters of P6-05 andP6-06.

  – If the pre-excited time is 0, the AC drive cancels pre-excitation and starts to run at startup frequency.
  – If the pre-excited time is not 0, the AC drive pre-excites first before startup, improving the dynamic response of the motor.

Parameter No.	Parameter Name	Setting Range	Default
P6-01	Rotational speed tracking mode	0: From frequency at stop 1: From zero speed 2: From maximum frequency	0

To complete the rotational speed tracking process within the shortest time, select the proper mode in which the AC drive tracks the motor rotational speed.

- 0: From frequency at stop

  It is the commonly selected mode.

- 1: From zero frequency

  It is applicable to restart after a long time of power failure.

- 2: From the maximum frequency

  It is applicable to the power-generating load.

Parameter No.	Parameter Name	Setting Range	Default
P6-02	Rotational speed tracking speed	1–100	20

In the rotational speed tracking restart mode, select the rotational speed tracking speed. The larger the value is, the faster the tracking is. However, too large value may cause unreliable tracking.

Parameter No.	Parameter Name	Setting Range	Default
P6-03	Startup frequency	0.00–10.00 Hz	0.00 Hz
P6-04	Startup frequency holding time	0.0–100.0s	0.0s

To ensure the motor torque at AC drive startup, set a proper startup frequency. In addition, to build excitation when the motor starts up, the startup frequency must be held for a certain period.

The startup frequency (P6-03) is not restricted by the frequency lower limit. If the set target frequency is lower than the startup frequency, the AC drive will not start and stays in the standby state.

During switchover between forward rotation and reverse rotation, the startup frequency holding time is disabled. The holding time is not included in the acceleration time but in the running time of simple PLC.

Example 1:

P0-03 = 0	The frequency source is digital setting.
P0-08 = 2.00 Hz	The digital setting frequency is 2.00 Hz.
P6-03 = 5.00 Hz	The startup frequency is 5.00 Hz.
P6-04 = 2.0s	The startup frequency holding time is 2.0s.

In this example, the AC drive stays in the standby state and the output frequency is 0.00 Hz. Example 2:

P0-03 = 0	The frequency source is digital setting.
P0-08 = 10.0 0 Hz	The digital setting frequency is 10.00 Hz.
P6-03 = 5.00 Hz	The startup frequency is 5.00 Hz.
P6-04 = 2.0s	The startup frequency holding time is 2.0s.

In this example, the AC drive accelerates to 5.00 Hz, and then accelerates to the set frequency 10.00 Hz after 2s.

Parameter No.	Parameter Name	Setting Range	Default
P6-05	Startup DC braking current/Pre-excited current	0%–100%	0%
P6-06	Startup DC braking time/Pre-excited time	0.0–100.0s	0.0s

Startup DC braking is generally used during restart of the AC drive after the rotating motor stops. Pre-excitation is used to make the AC drive build magnetic field for the asynchronous motor before startup to improve the responsiveness.

Startup DC braking is valid only for direct start (P6-00 = 0). In this case, the AC drive performs DC braking at the set startup DC braking current. After the startup DC braking time, the AC drive starts to run. If the startup DC braking time is 0, the AC drive starts directly without DC braking. The larger the startup DC braking current is, the larger the braking force is.

If the startup mode is pre-excited start (P6-00 = 3), the AC drive builds magnetic field based on the set pre-excited current. After the pre-excited time, the AC drive starts to run. If the pre-excited time is 0, the AC drive starts directly without pre-excitation.

The startup DC braking current or pre-excited current is a percentage relative to the base value.

- If the rated motor current is less than or equal to 80% of the rated AC drive current, the base value is the rated motor current.
- If the rated motor current is greater than 80% of the rated AC drive current, the base value is 80% of the rated AC drive current.

Parameter No.	Parameter Name	Setting Range	Default
P6-07	Acceleration/ Deceleration mode	0: Linear acceleration/deceleration 1: S-curve acceleration/deceleration A 2: S-curve acceleration/deceleration B	0

It is used to set the frequency change mode during the AC drive start and stop process.

- 0: Linear acceleration/deceleration

  The output frequency increases or decreases in a straight line.

- 1: S-curve acceleration/deceleration A

The output frequency increases or decreases according to the S-curve. The S-curve is used in places that require a gentle start or stop, such as elevators, conveyor belts, etc.

- 2: S-curve acceleration/deceleration B

It is generally used in high-speed areas above the rated frequency where rapid acceleration and deceleration are required.

Parameter No.	Parameter Name	Setting Range	Default
F6-08	Time proportion of S-curve start segment	0.0% to (100.0% – F6-09)	30.0%
F6-09	Time proportion of S-curve end segment	0.0% to (100.0% – F6-08)	30.0%

These two parameters respectively define the time proportions of the start segment and the end segment of S-curve acceleration/deceleration. They must satisfy the requirement: P6-08 + P6-09 ≤ 100.0%.

In Figure 6-12, t1 is the time defined in P6-08, within which the slope of the output frequency change increases gradually. t2 is the time defined in P6-09, within which the slope of the output frequency change gradually decreases to 0. Within the time between t1 and t2, the slope of the output frequency change remains unchanged, that is, linear acceleration/ deceleration.

Figure 10-12 S-curve acceleration/deceleration

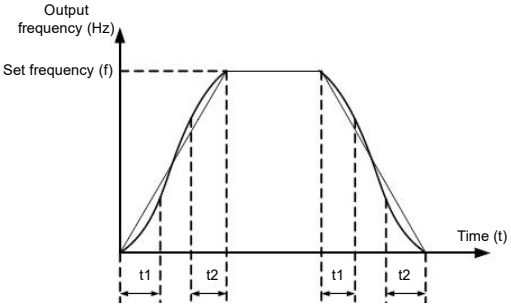
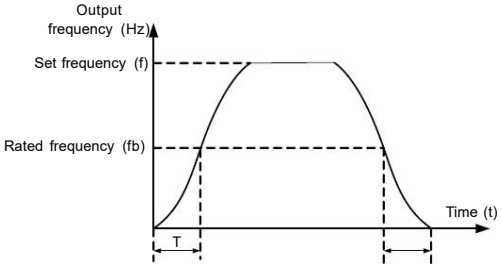


Figure 10-13 S-curve acceleration/deceleration B



- 0: Decelerate to stop

  After the stop command is enabled, the AC drive decreases the output frequency according to the deceleration time and stops when the frequency decreases to zero.

Parameter No.	Parameter Name	Setting Range	Default
P6-10	Stop mode	0: Decelerate to stop 1: Coast to stop	0

- 1: Coast to stop

  After the stop command is enabled, the AC drive immediately stops the output. The motor will coast to stop based on the mechanical inertia.

Parameter No.	Parameter Name	Setting Range	Default
P6-11	Initial frequency of stop DC braking	0.00 Hz to maximum frequency	0.00 Hz
P6-12	Waiting time of stop DC braking	0.0–36.0s	0.0s
P6-13	Stop DC braking current	0%–100%	0%
P6-14	Stop DC braking time	0.0–36.0s	0.0s

- P6-11 (Initial frequency of stop DC braking)

  During the process of decelerating to stop, the AC drive starts DC braking when the running frequency is lower than the value set in F6-11.

- P6-12 (Waiting time of stop DC braking)

When the running frequency decreases to the initial frequency of stop DC braking, the AC drive stops output for a certain period and then starts DC braking. This prevents faults such as overcurrent caused due to DC braking at high speed.

- P6-13 (Stop DC braking current)

  This parameter specifies the output current at DC braking and is a percentage relative to the base value.

  – If the rated motor current is less than or equal to 80% of the rated AC drive current, the base value is the rated motor current.

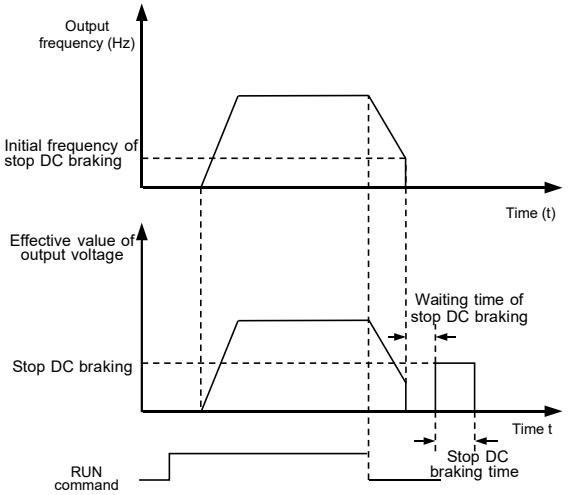
  – If the rated motor current is greater than 80% of the rated AC drive current, the base value is 80% of the rated AC drive current.

- P10-14 (Stop DC braking time)

This parameter specifies the holding time of DC braking. If it is set to 0, DC braking is cancelled.

The stop DC braking process is shown in the following figure. Figure

10-14 Stop DC braking process

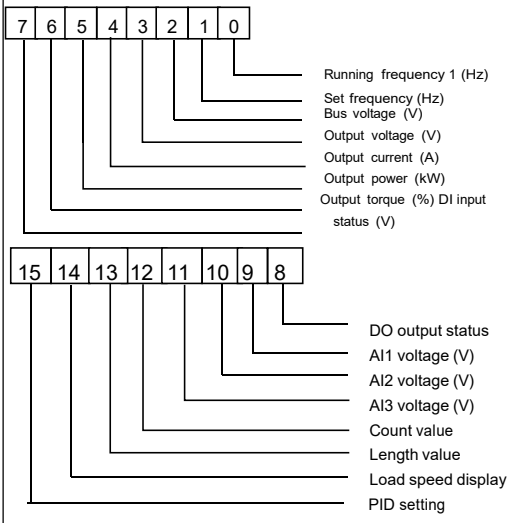


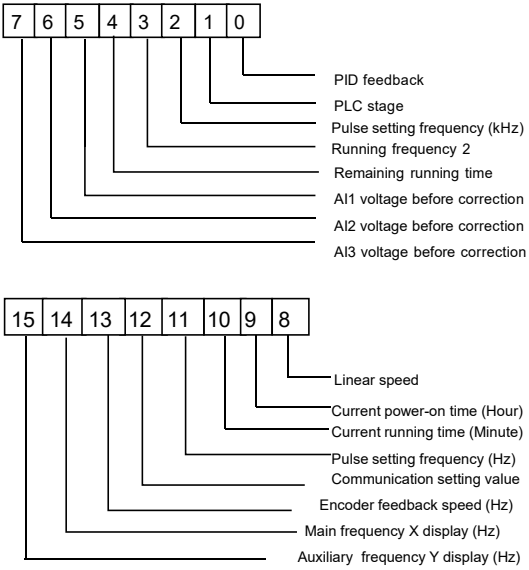
Parameter No.	Parameter Name	Setting Range	Default
P6-15	Brake use ratio	0%–100%	100%

It is valid only for the AC drive with internal braking unit and used to adjust the duty ratio of the braking unit. The larger the value of this parameter is, the better the braking result will be. However, too larger value causes great fluctuation of the AC drive bus voltage during the braking process.

Group F7: Operating Panel and Display

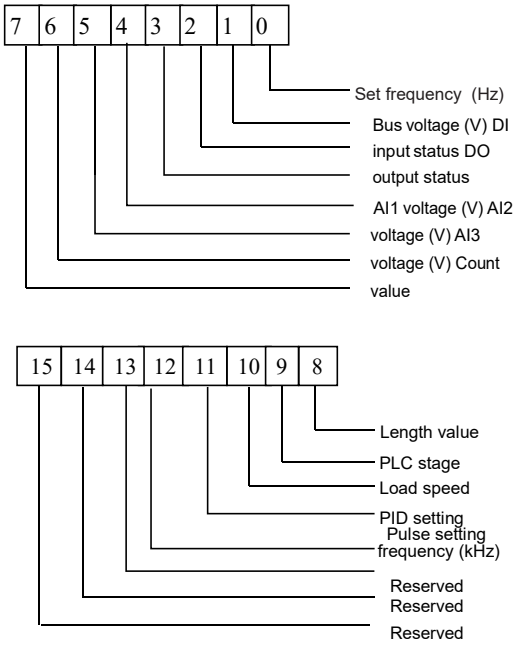
Parameter No.	Parameter Name	Setting Range	Default
P7-02	STOP/RESET key function	0: STOP/RESET key enabled only in operating panel control 1: STOP/RESET key enabled in any operation mode	1

Parameter No.	Parameter Name	Setting Range	Default
P7-03	LED display running parameters 1	0000–FFFF  If a parameter needs to be displayed during the running, set the corresponding bit to 1, and setP7-03 to the hexadecimal equivalent of this binary number.	1F

<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Setting Range</th><th>Default</th></tr>
<tr><td>P7-04</td><td>LED display running parameters 2</td><td>0000–FFFF
 

If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set P7-04 to the hexadecimal equivalent of this binary number.</td><td>0</td></tr>
</table>

These two parameters are used to set the parameters that can be viewed when the AC drive is in the running state. You can view a maximum of 32 running state parameters that are displayed from the lowest bit of F7-03.

Parameter No.	Parameter Name	Setting Range	Default
P7-05	LED display stop parameters	0000–FFFF  If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set P7-05 to the hexadecimal equivalent of this binary number.	0

Parameter No.	Parameter Name	Setting Range	Default
P7-06	Load speed display coefficient	0.0001–6.5000	1.0000

This parameter is used to adjust the relationship between the output frequency of the AC drive and the load speed.

Parameter No.	Parameter Name	Setting Range	Default
P7-07	Heatsink temperature of AC drive IGBT	0.0–100.0℃	-

It is used to display the insulated gate bipolar transistor (IGBT) temperature of the AC drive IGBT, and the IGBT overheat protection value of the AC drive IGBT depends on the model.

Parameter No.	Parameter Name	Setting Range	Default
P7-09	Accumulative running time	0–65535 h	-

It is used to display the accumulative running time of the AC drive. After the accumulative running time reaches the value set in P8-17, the terminal with the digital output function 12 becomes ON.

Parameter No.	Parameter Name	Setting Range	Default
P7-12	Number of decimal places for load speed display	Bit: d0-14 the number of decimal places 0: 0 decimal places 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places Ten: d0-19/d0-29 the number of decimal places 1: 1 decimal place 2: 2 decimal places	21

Parameter No.	Parameter Name	Setting Range	Default
P7-13	Accumulative power-on time	0–65535 h	0 h

It is used to display the accumulative power-on time of the AC drive since the delivery. If the time reaches the set power-on time P8-17), the terminal with the digital output function 24 becomes ON.

Parameter No.	Parameter Name	Setting Range	Default
P7-14	Accumulative power consumption	0–65535 kWh	/

It is used to display the accumulative power consumption of the AC drive until now.

Group P8: Auxiliary Functions

Parameter No.	Parameter Name	Setting Range	Default
P8-00	JOG running frequency	0.00 Hz to maximum frequency	2.00 Hz
P8-01	JOG acceleration time	0.0–6500.0s	20.0s
P8-02	JOG deceleration time	0.0–6500.0s	20.0s

These parameters are used to define the set frequency and acceleration/deceleration time of the AC drive when jogging. The startup mode is "Direct start" (P6-00 = 0) and the stop mode is "Decelerate to stop" (P6-10 = 0) during jogging.

Parameter No.	Parameter Name	Setting Range	Default
P8-03	Acceleration time 2	0.0–6500.0s	Model dependent

Parameter No.	Parameter Name	Setting Range	Default
P8-04	Deceleration time 2	0.0–6500.0s	Model dependent
P8-05	Acceleration time 3	0.0–6500.0s	Model dependent
P8-06	Deceleration time 3	0.0–6500.0s	Model dependent
P8-07	Acceleration time 4	0.0–500.0s	Model dependent
P8-08	Deceleration time 4	0.0–6500.0s	Model dependent

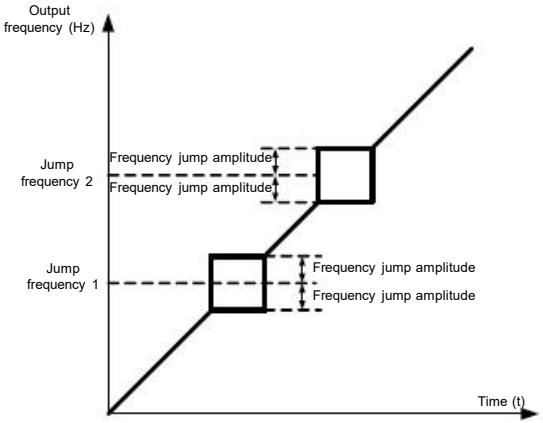
The EV200 provides a total of four groups of acceleration/deceleration time, that is, the preceding three groups and the group defined by P0-17 and P0-18. Definitions of four groups are completely the same. You can switch over between the four groups of acceleration/deceleration time through different state combinations of DI terminals. For more details, see the descriptions of P4-01 to P4-05.

Parameter No.	Parameter Name	Setting Range	Default
P8-09	Jump frequency 1	0.00 Hz to maximum frequency	0.00 Hz
P8-10	Jump frequency 2	0.00 Hz to maximum frequency	0.00 Hz
P8-11	Frequency jump amplitude	0.00 Hz to maximum frequency	0.00 Hz

If the set frequency is within the frequency jump range, the actual running frequency is the jump frequency close to the set frequency. Setting the jump frequency helps to avoid the mechanical resonance point of the load.

The EV200 supports two jump frequencies. If both are set to 0, the frequency jump function is disabled. The principle of the jump frequencies and jump amplitude is shown in the following figure.

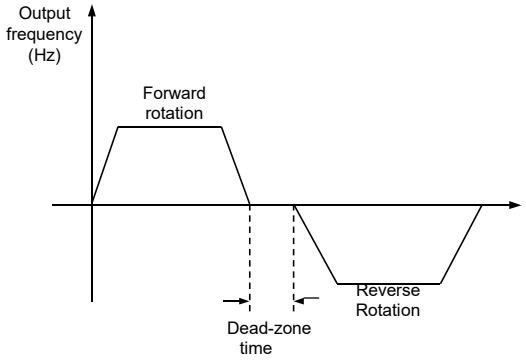
Figure 10-15 Principle of the jump frequencies and jump amplitude



Parameter No.	Parameter Name	Setting Range	Default
P8-12	Forward/Reverse rotation dead-zone time	0.0–3000.0s	0.0s

It is used to set the time when the output is 0 Hz at transition of the AC drive forward rotation and reverse rotation, as shown in the following figure.

Figure 10-16 Forward/Reverse rotation dead-zone time



Parameter No.	Parameter Name	Setting Range	Default
F8-13	Reverse control	0: Enabled 1: Disabled	0

It is used to set whether the AC drive allows reverse rotation. In the applications where reverse rotation is prohibited, set this parameter to 1.

Parameter No.	Parameter Name	Setting Range	Default
P8-14	Running mode when set frequency lower than frequency lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	0

It is used to set the AC drive running mode when the set frequency is lower than the frequency lower limit. The EV200 provides three running modes to satisfy requirements of various applications.

Parameter No.	Parameter Name	Setting Range	Default
P8-15	Droop control	0.00–10.00 Hz	0.00 Hz

This function is used for balancing the workload allocation when multiple motors are used to drive the same load. The output frequency of the AC drives decreases as the load increases. You can reduce the workload of the motor under load by decreasing the output frequency for this motor, implementing workload balancing between multiple motors.

Parameter No.	Parameter Name	Setting Range	Default
P8-16	Accumulative power-on time threshold	0–65000 h	0 h

If the accumulative power-on time (P7-13) reaches the value set in this parameter, the corresponding DO terminal becomes ON.

For example,

reports an alarm when the actual accumulative power-on time reaches the threshold of 100 hours, perform the setting as follows:

F8-16 = 100 h.

Then, the AC drive reports FU27 when the accumulative power-on time reaches 100 hours.

Parameter No.	Parameter Name	Setting Range	Default
P8-17	Accumulative running time threshold	0–65000 h	0 h

It is used to set the accumulative running time threshold of the AC drive. If the accumulative running time (P7-09) reaches the value set in this parameter, the corresponding DO terminal becomes ON.

Parameter No.	Parameter Name	Setting Range	Default
P8-18	Startup protection	0: No 1: Yes	0

This parameter is used to set whether to enable the safety protection. If it is set to 1, the AC drive does not respond to the run command valid upon AC drive power-on (for example, an input terminal is ON before power-on). The AC drive responds only after the run command is cancelled and becomes valid again.

In addition, the AC drive does not respond to the run command valid upon fault reset of the AC drive. The run protection can be disabled only after the run command is cancelled.

In this way, the motor can be protected from responding to run commands upon power-on or fault reset in unexpected conditions.

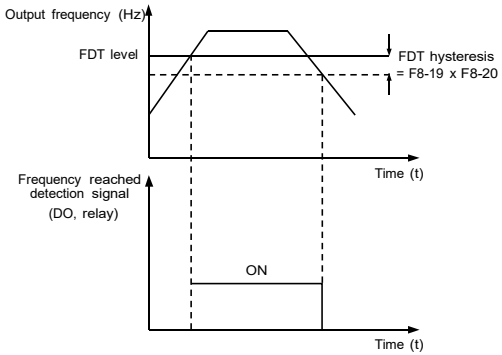
Parameter No.	Parameter Name	Setting Range	Default
P8-19	Frequency detection value (FDT1)	0.00 Hz to maximum frequency	50.00 Hz
P8-20	Frequency detection hysteresis (FDT hysteresis 1)	0.0%–100.0% (FDT1 level)	5.0%

If the running frequency is higher than the value of P8-19, the corresponding DO terminal becomes ON. If the running frequency is lower than value of P8-19, the DO terminal goes OFF

These two parameters are respectively used to set the detection value of output frequency and hysteresis value upon cancellation of the output. The value of P8-20 is a percentage of the hysteresis frequency to the frequency detection value (P8-19).

The FDT function is shown in the following figure.

Figure 10-17 FDT level

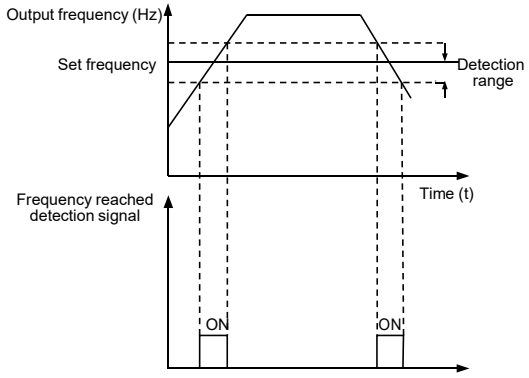


Parameter No.	Parameter Name	Setting Range	Default
P8-21	Detection width of target frequency reached	0.00–100% (maximum frequency)	0.0%

If the AC drive running frequency is within the certain range of the set frequency, the corresponding DO terminal becomes ON.

This parameter is used to set the range within which the output frequency is detected to reach the set frequency. The value of this parameter is a percentage relative to the maximum frequency. The detection range of frequency reached is shown in the following figure.

Figure 10-18 Detection range of frequency reached

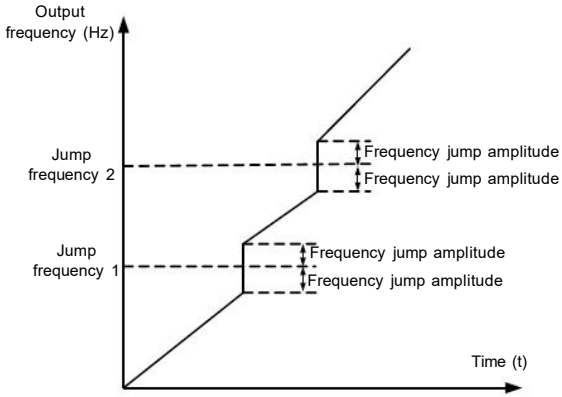


Parameter No.	Parameter Name	Setting Range	Default
P8-22	Jump frequency during acceleration/deceleration	0: Disabled 1: Enabled	0

It is used to set whether the jump frequencies are valid during acceleration/deceleration.

When the jump frequencies are valid during acceleration/deceleration, and the running frequency is within the frequency jump range, the actual running frequency will jump over the set frequency jump amplitude (rise directly from the lowest jump frequency to the highest jump frequency). The following figure shows the diagram when the jump frequencies are valid during acceleration/deceleration.

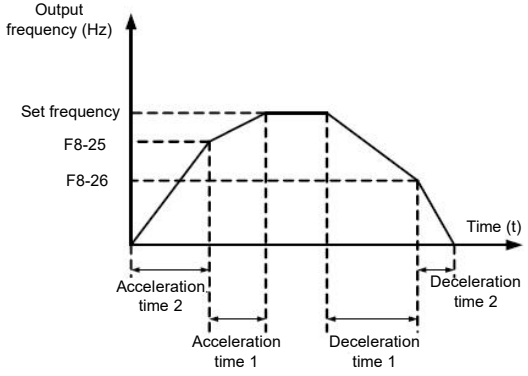
Figure 10-19 Diagram when the jump frequencies are valid during acceleration/deceleration



Parameter No.	Parameter Name	Setting Range	Default
P8-25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00 Hz to maximum frequency	0.00 Hz
P8-26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00 to maximum frequency	0.00 Hz

This function is valid when motor 1 is selected and acceleration/deceleration time switchover is not performed by means of DI terminal. It is used to select different groups of acceleration/ deceleration time based on the running frequency range rather than DI terminal during the running process of the AC drive.

Figure 10-20 Acceleration/deceleration time switchover



During acceleration, if the running frequency is smaller than the value of P8-25, acceleration time 2 is selected. If the running frequency is larger than the value of P8-25, acceleration time 1 is selected.

During deceleration, if the running frequency is larger than the value of P8-26, deceleration time 1 is selected. If the running frequency is smaller than the value of P8-26, deceleration time 2 is selected.

Parameter No.	Parameter Name	Setting Range	Default
P8-27	Terminal JOG preferred	0: Disabled 1: Enabled	0

It is used to set whether terminal JOG is preferred.

If terminal JOG is preferred, the AC drive switches to terminal JOG running state when there is a terminal JOG command during the running process of the AC drive.

Parameter No.	Parameter Name	Setting Range	Default
P8-28	Frequency detection value (FDT2)	0.00 to maximum frequency	50.00 Hz
P8-29	Frequency detection hysteresis (FDT hysteresis 2)	0.0%–100.0% (FDT2 level)	5.0%

The frequency detection function is the same as FDT1 function. For details, refer to the descriptions of P8-19 and P8-20.

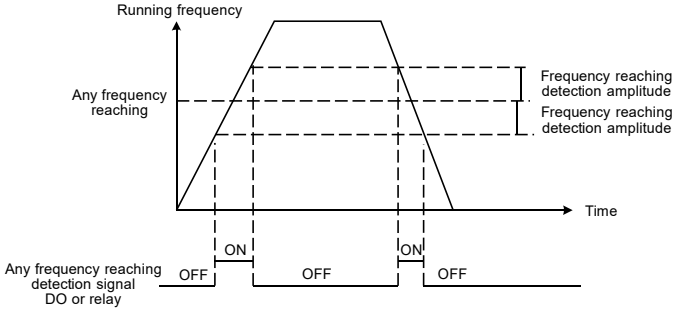
Parameter No.	Parameter Name	Setting Range	Default
P8-30	Any frequency reaching detection value 1	0.00 Hz to maximum frequency	50.00 Hz
P8-31	Any frequency reaching detection amplitude 1	0.0%–100.0% (maximum frequency)	0.0%
P8-32	Any frequency reaching detection value 2	0.00 Hz to maximum frequency	50.00 Hz

Parameter No.	Parameter Name	Setting Range	Default
P8-33	Any frequency reaching detection amplitude 2	0.0%–100.0% (maximum frequency)	0.0%

If the output frequency of the AC drive is within the positive and negative amplitudes of the any frequency reaching detection value, the corresponding DO becomes ON.

The EV200 provides two groups of any frequency reaching detection parameters, including frequency detection value and detection amplitude, as shown in the following figure.

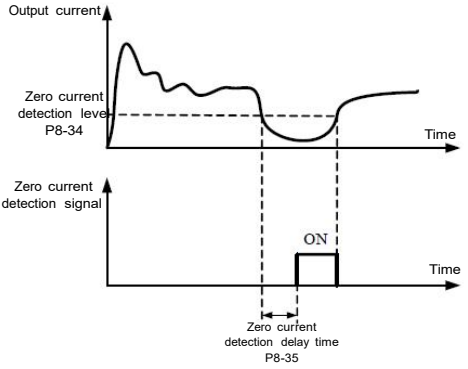
Figure 10-21 Any frequency reaching detection



Parameter No.	Parameter Name	Setting Range	Default
P8-34	Zero current detection level	0.0%–300.0% (rated motor current)	5.0%
P8-35	Zero current detection delay time	0.00–600.00s	0.10s

If the output current of the AC drive is equal to or less than the zero current detection level and the duration exceeds the zero current detection delay time, the corresponding DO becomes ON. The zero current detection is shown in the following figure.

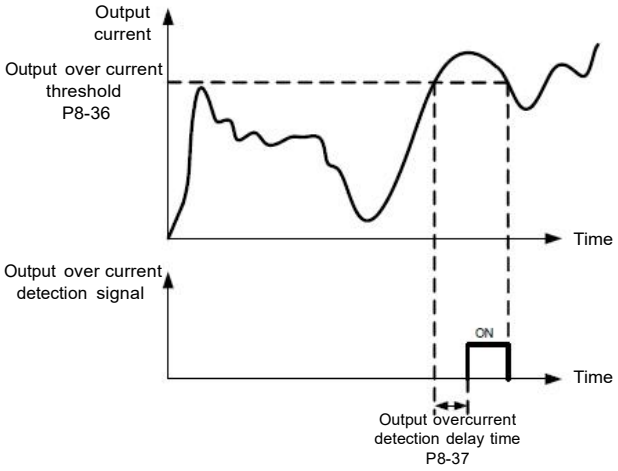
Figure 10-22 Zero current detection



Parameter No.	Parameter Name	Setting Range	Default
P8-36	Output over current threshold	0.0% (no detection) 0.1%–300.0% (rated motor current)	200.0%
P8-37	Output over current detection delay time	0.00–600.00s	0.00s

If the output current of the AC drive is equal to or higher than the over current threshold and the duration exceeds the detection delay time, the corresponding DO becomes ON. The output over current detection function is shown in the following figure.

Figure 10-23 Output overcurrent detection

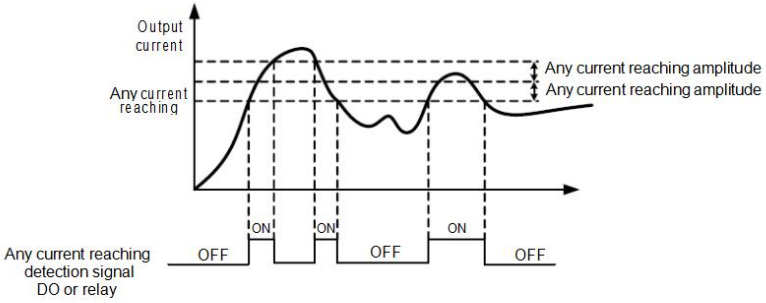


Parameter No.	Parameter Name	Setting Range	Default
P8-38	Any current reaching 1	0.0%–300.0% (rated motor current)	100.0%
P8-39	Any current reaching 1 amplitude	0.0%–300.0% (rated motor current)	0.0%
P8-40	Any current reaching 2	0.0%–300.0% (rated motor current)	100.0%
P8-41	Any current reaching 2 amplitude	0.0%–300.0% (rated motor current)	0.0%

If the output current of the AC drive is within the positive and negative amplitudes of any current reaching detection value, the corresponding DO becomes ON.

The EV200 provides two groups of any current reaching detection parameters, including current detection value and detection amplitudes, as shown in the following figure.

Figure 10-24 Any current reaching detection



Parameter No.	Parameter Name	Setting Range	Default
P8-42	Timing function	0: Disabled 1: Enabled	0
P8-43	Timing duration source	0: P8-44 1: AI1 2: AI2 3: AI3 (100% of analog input corresponds to the value of P8-44)	0
P8-44	Timing duration	0.0–6500.0 min	0.0 min

These parameters are used to implement the AC drive timing function.

If P8-42 is set to 1, the AC drive starts to time at startup. When the set timing duration is reached, the AC drive stops automatically and meanwhile the corresponding DO becomes ON.

The AC drive starts timing from 0 each time it starts up and the remaining timing duration can be queried by d0-20.

The timing duration is set in P8-43 and P8-44, in unit of minute.

Parameter No.	Parameter Name	Setting Range	Default
P8-45	AI1 input voltage lower limit	0.00 V to F8-46	3.10 V
P8-46	AI1 input voltage upper limit	F8-45 to 10.00 V	6.80 V

These two parameters are used to set the limits of the input voltage to provide protection on the AC drive. When the AI1 input is larger than the value of P8-46 or smaller than the value of P8-45, the corresponding DO becomes ON, indicating that AI1 input exceeds the limit.

Parameter No.	Parameter Name	Setting Range	Default
P8-47	Sleep mode selection	0:no sleep 1:no sleep pressure judgment 2:sleep pressure= setting pressure*sleep pressure percentage wake up pressure= setting pressure* wake up pressure percentage	0

Parameter No.	Parameter Name	Setting Range	Default
P8-49	sleep pressure	90%-100%	98%
P8-50	Wake up pressure	0%-100%	60%
P8-51	sleep frequency	0.00 -50HZ	30 Hz
P8-52	Wake up frequency	0.0–50HZ	40 Hz

Parameter No.	Parameter Name	Setting Range	Default
P8-53	wake up delay	0.0–6500.0 S	3S

Parameter No.	Parameter Name	Setting Range	Default
P8-54	sleep delay	0-6500S	5S

This set of parameters is used to enable sleep and wake up functions in water supply applications.

During the operation of the frequency converter, when the set frequency is less than or equal to the sleep frequency of P8-51, after the delay time of P8-54, the frequency converter enters

Enter hibernation state and automatically stop.

If the frequency converter is in hibernation state, and the current running command is effective, when the set frequency is greater than or equal to the P8-52 wake frequency, pass

Time P8-53 After the delay time, the inverter starts to start.

Generally, set the wake frequency to be greater than or equal to the sleep frequency. If the wake up frequency and sleep frequency are both set to 0.00Hz, the system sleeps

And wake up function is invalid.

When the hibernation function is enabled, if PID is used by the frequency source, whether PID operates in the hibernation state depends on the function code PA-28

PID operation (PA-28=1) must be selected.

Group P9: Fault and Protection

Parameter No.	Parameter Name	Setting Range	Default
F9-00	Motor overload protection selection	0: Disabled 1: Enabled	1
F9-01	Motor overload protection gain	0.20–10.00	1.00

- P9-00 = 0

The motor overload protective function is disabled. The motor is exposed to potential damage due to overheating. A thermal relay is suggested to be installed between the AC drive and the motor.

- P9-00 = 1

The AC drive judges whether the motor is overloaded according to the inverse time-lag curve of the motor overload protection.

The inverse time-lag curve of the motor overload protection is:

220% x P9-01 x rated motor current (if the load remains at this value for one minute, the AC drive reports motor overload fault), or 150% x P9-01 x rated motor current (if the load remains at this value for 60 minutes, the AC drive reports motor overload fault)

Set P9-01 properly based on the actual overload capacity. If the value of P9-01 is set too large, damage to the motor may result because the motor overheats but the AC drive does not report the alarm.

Parameter No.	Parameter Name	Setting Range	Default
P9-02	Motor overload Pre-warning coefficient	50%–100%	80%

This function is used to give a warning signal to the control system via DO before motor overload protection. This parameter is used to determine the percentage, at which pre-warning is performed before motor overload. The larger the value is, the less advanced the pre-warning will be.

When the accumulative output current of the AC drive is greater than the value of the overload inverse time-lag curve multiplied by P9-02, the DO terminal on the AC drive allocated with function 6 (Motor overload pre-warning) becomes ON.

Parameter No.	Parameter Name	Setting Range	Default
P9-03	Over voltage protection gain	0 –100	30
P9-04	Over voltage protection voltage	120%–150%	770V

When the DC bus voltage exceeds the value of P9-04 (Over voltage stall protective voltage) during deceleration of the AC drive, the AC drive stops deceleration and keeps the present running frequency. After the bus voltage declines, the AC drive continues to decelerate.

P9-03 (Over voltage stall gain) is used to adjust the over voltage suppression capacity of the AC drive. The larger the value is, the greater the over voltage suppression capacity will be.

In the prerequisite of no over voltage occurrence, set F9-03 to a small value.

For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and an over voltage fault may occur.

If the over voltage stall gain is set to 0, the over voltage stall function is disabled. The over voltage stall protective voltage setting 100% corresponds to the base values in the following table:

Table 10-6 Overvoltage stall protective voltage setting 100% corresponds to base values

Voltage Class	Corresponding Base Value
Single-phase 220 V	290 V
Three-phase 220 V	290 V
Three-phase 380 V	530 V
Three-phase 480 V	620 V
Three-phase 690 V	880 V

Parameter No.	Parameter Name	Setting Range	Default
P9-09	Fault auto reset times	0–20	0

It is used to set the times of fault auto resets if this function is used. After the value is exceeded, the AC drive will remain in the fault state.

Parameter No.	Parameter Name	Setting Range	Default
P9-10	HDO action during fault auto reset	0: Not act 1: Act	0

It is used to decide whether the HDO acts during the fault auto reset if the fault auto reset function is selected.

Parameter No.	Parameter Name	Setting Range	Default
P9-11	Time interval of fault auto reset	0.1s–100.0s	1.0s

It is used to set the waiting time from the alarm of the AC drive to fault auto reset.

Parameter No.	Parameter Name	Setting Range	Default
F9-12	Input phase loss/ Pre-charge relay protection	Unit digit:input phase loss protection selection Tenth place:Contactor pull-in protection selection 0:Forbidden 1:Allowed	-

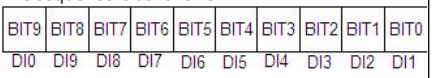
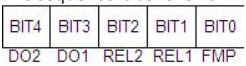
Parameter No.	Parameter Name	Setting Range	Default
P9-13	Output phase loss protection	Unit digit:output phase loss protection selection 0:Forbidden 1:Allowed Tenth place:output phase loss protection selection before running	01

It is used to determine whether to perform output phase loss protection.

Parameter No.	Name	Setting Range
P9-14	1st fault type	0–99
P9-15	2nd fault type	
P9-16	3rd (latest) fault type	

It is used to record the types of the most recent three faults of the AC drive. 0 indicates no fault.

Parameter No.	Parameter Name	Description
P9-17	Frequency upon 3rd fault	It displays the frequency when the latest fault occurs.
P9-18	Current upon 3rd fault	It displays the current when the latest fault occurs.
P9-19	Bus voltage upon 3rd fault	It displays the bus voltage when the latest fault occurs.

Parameter No.	Parameter Name	Description
P9-20	DI status upon 3rd fault	It displays the status of all DI terminals when the latest fault occurs. The sequence is as follows:  If a DI is ON, the setting is 1. If the DI is OFF, the setting is 0. The value is the equivalent decimal number converted from the DI status..
P9-21	Output terminal status upon 3rd fault	It displays the status of all output terminals when the latest fault occurs. The sequence is as follows:  If an output terminal is ON, the setting is 1. If the output terminal is OFF, the setting is 0. The value is the equivalent decimal number converted from the DI statuses.
P9-22	AC drive status upon 3rd fault	Reserved
P9-23	Power-on time upon 3rd fault	It displays the present power-on time when the latest fault occurs.
P9-24	Running time upon 3rd fault	It displays the present running time when the latest fault occurs.
P9-27	Frequency upon 2nd fault	Same as P9-17–P9-24.
P9-28	Current upon 2nd fault	
P9-29	Bus voltage upon 2nd fault	
P9-30	DI status upon 2nd fault	
P9-31	Output terminal status upon 2nd fault	
P9-32	Frequency upon 2nd fault	
P9-33	Current upon 2nd fault	
P9-34	Bus voltage upon 2nd fault	
P9-37	DI status upon 1st fault	Same as P9-17–P9-24.
P9-38	Output terminal status upon 1st fault	
P9-39	Frequency upon 1st fault	
P9-40	Current upon 1st fault	
P9-41	Bus voltage upon 3rd fault	
P9-42	DI status upon 1st fault	
P9-43	Output terminal status upon 1st fault	
P9-44	Frequency upon 1st fault	

Parameter No.	Parameter Name	Setting Range	Default
F9-47	Fault protection action selection 1	Ones position (Motor overload, FU11)	00000
		0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	
		Tens position (Power input phase loss, FU12)	
		Same as Ones position	
		Hundreds position (Power output phase loss, FU13)	
		Same as Ones position	
		Thousands position (External equipment fault, FU15)	
		Same as Ones position	
		Ten Thousands position (Communication fault, FU16)	
		Same as Ones position	
F9-48	Fault protection action selection 2	Ones position (Encoder fault, FU20)	00000
		0: Coast to stop 1: Switch over to V/F control, stop according to the stop mode 2: Switch over to V/F control, continue to run	
		Tens position (EEPROM read-write fault, FU21)	
		0: Coast to stop 1: Stop according to the stop mode	
		Hundreds position: reserved	
		Thousands position (Motor overheat, FU25)	
		Same as Ones position in P9-47	
		Ten Thousands position (Accumulative running time reached)	
		Same as Ones position in P9-47	

Parameter No.	Parameter Name	Setting Range	Default
P9-49	Fault protection action selection 3	Ones position (User-defined fault 1, FU27)	00000
		Same as Ones position in P9-47	
		Tens position (User-defined fault 2, FU28)	
		Same as Ones position in P9-47	
		Hundreds position (Accumulative power-on time reached, FU29)	
		Same as Ones position in P9-47	
		Thousands position (Load becoming 0, FU30)	
		0: Coast to stop 1: Stop according to the stop mode 2: Continue to run at 7% of rated motor frequency and resume to the set frequency if the load recovers	
		Ten Thousands position (PID feedback lost during running, FU31)	
		Same as Ones position in F9-47	
P9-50	Fault protection action selection 4	Ones position (Too large speed deviation, FU42)	00000
		Same as Ones position inP9-47	
		Tens position (Motor over-speed, FU43)	
		Same as Ones position in P9-47	
		Hundreds position (Initial position fault, FU51)	
		Same as Ones position in P9-47	
		Thousands position (Speed feedback fault, FU52)	
		Same as Ones position inP9-47	
		Ten Thousands position: Reserved	

If "Coast to stop" is selected, the AC drive displays FU** and directly stops.

- If "Stop according to the stop mode" is selected, the AC drive displays A** and stops according to the stop mode. After stop, the AC drive displays FU**.
- If "Continue to run" is selected, the AC drive continues to run and displays A**. The running frequency is set in P9-54.

Parameter No.	Parameter Name	Setting Range	Default
P9-54	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Set frequency 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	0
P9-55	Backup frequency upon abnormality	0.0%–100.0% (maximum frequency)	100.0%

If a fault occurs during the running of the AC drive and the handling of fault is set to "Continue to run", the AC drive displays A** and continues to run at the frequency set in P9-54.

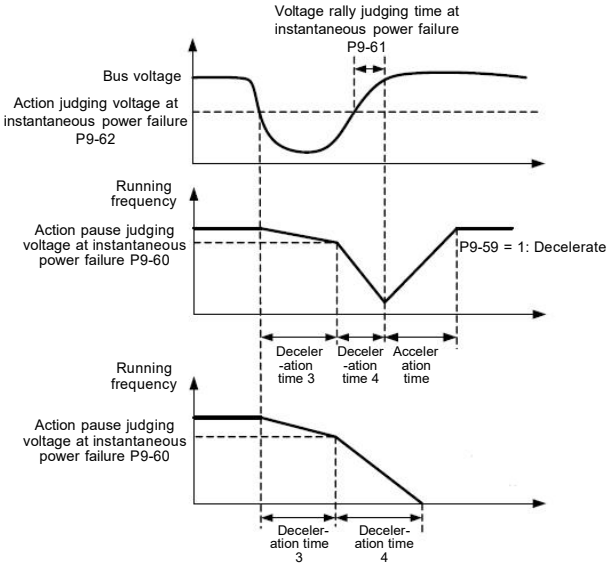
The setting of P9-55 is a percentage relative to the maximum frequency.

Parameter No.	Parameter Name	Setting Range	Default
P9-59	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	0
P9-60	Action pause judging voltage at instantaneous power failure	80.0%–100.0%	90.0%
P9-61	Voltage rally judging time at instantaneous power failure	0.00–100.00s	0.50s
P9-62	Action judging voltage at instantaneous power failure	60.0%–100.0% (standard bus voltage)	80.0%

Upon instantaneous power failure or sudden voltage dip, the DC bus voltage of the AC drive reduces. This function enables the AC drive to compensate the DC bus voltage reduction with the load feedback energy by reducing the output frequency so as to keep the AC drive running continuously.

- If P9-59 = 1, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates. Once the bus voltage resumes to normal, the AC drive accelerates to the set frequency. If the bus voltage remains normal for the time exceeding the value set in F9-61, it is considered that the bus voltage resumes to normal.
- If P9-59 = 2, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates to stop.

Figure 10-25 AC drive action diagram upon instantaneous power failure



Parameter No.	Parameter Name	Setting Range	Default
P9-63	Protection upon load becoming 0	0: Disabled 1: Enabled	0
P9-64	Detection level of load becoming 0	0.0%–100.0% (rated motor current)	10.0%
P9-65	Detection time of load becoming 0	0.0–60.0s	1.0s

If protection upon load becoming 0 is enabled, when the output current of the AC drive is lower than the detection level (P9-64) and the lasting time exceeds the detection time (P9-65), the output frequency of the AC drive automatically declines to 7% of the rated frequency. During the protection, the AC drive automatically accelerates to the set frequency if the load resumes to normal.

Parameter No.	Parameter Name	Setting Range	Default
P9-67	Over-speed detection value	0.0%–50.0% (maximum frequency)	20.0%
P9-68	Over-speed detection time	0.0–60.0s	1.0s

This function is valid only when the AC drive runs in the FVC mode.

If the actual motor rotational speed detected by the AC drive exceeds the maximum frequency and the excessive value is greater than the value of F9-67 and the lasting time exceeds the value of F9-68, the AC drive reports Err43 and acts according to the selected fault protection action.

If the over-speed detection time is 0.0s, the over-speed detection function is disabled.

Parameter No.	Parameter Name	Setting Range	Default
P9-69	Detection value of too large speed deviation	0.0%–50.0% (maximum frequency)	20.0%
P9-70	Detection time of too large speed deviation	0.0–60.0s	5.0s

This function is valid only when the AC drive runs in the FVC mode.

If the AC drive detects the deviation between the actual motor rotational speed detected by the AC drive and the set frequency is greater than the value of P9-69 and the lasting time exceeds the value of P9-70, the AC drive reports FU42 and according to the selected fault protection action.

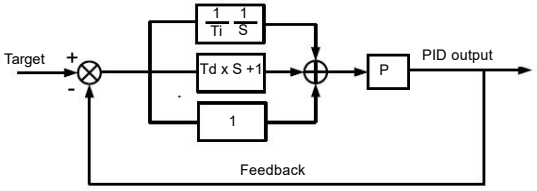
If P9-70 (Detection time of too large speed deviation) is 0.0s, this function is disabled.

Group FA: Process Control PID Function

PID control is a general process control method. By performing proportional, integral and differential operations on the difference between the feedback signal and the target signal, it adjusts the output frequency and constitutes a feedback system to stabilize the controlled counter around the target value.

It is applied to process control such as flow control, pressure control and temperature control. The following figure shows the principle block diagram of PID control.

Figure 10-26 Principle block diagram of PID control



Parameter No.	Parameter Name	Setting Range	Default
PA-00	PID setting source	0: FA-01 1: AI1 2: AI2 3: AI3 4: Pulse setting (S5) 5: Communication setting 6: Multi-reference	0
PA-01	PID digital setting	0.0%–100.0%	50.0%

PA-00 is used to select the channel of target process PID setting. The PID setting is a relative value and ranges from 0.0% to 100.0%. The PID feedback is also a relative value. The purpose of PID control is to make the PID setting and PID feedback equal.

Parameter No.	Parameter Name	Setting Range	Default
PA-02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 – AI2 4: Pulse setting (S5) 5: Communication setting 6: AI1 + AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0

This parameter is used to select the feedback signal channel of process PID. The PID feedback is a relative value and ranges from 0.0% to 100.0%.

Parameter No.	Parameter Name	Setting Range	Default
PA-03	PID action direction	0: Forward action 1: Reverse action	0

- 0: Forward action

  When the feedback value is smaller than the PID setting, the AC drive's output frequency rises. For example, the winding tension control requires forward PID action.

- 1: Reverse action

  When the feedback value is smaller than the PID setting, the AC drive's output frequency reduces. For example, the unwinding tension control requires reverse PID action.

  Note that this function is influenced by the DI function 35 "Reverse PID action direction".

Parameter No.	Parameter Name	Setting Range	Default
PA-04	PID setting feedback range	0–65535	1000

This parameter is a non-dimensional unit. It is used for PID setting display (d0-15) and PID feedback display (d0-16).

Relative value 100% of PID setting feedback corresponds to the value of PA-04. If PA-04 is set to 2000 and PID setting is 100.0%, the PID setting display (d0-15) is 2000.

Parameter No.	Parameter Name	Setting Range	Default
PA-05	Proportional gain Kp1	0.0–100.0	20.0
PA-06	Integral time Ti1	0.01–10.00s	2.00s
FA-07	Differential time Td1	0.00–10.000	0.000s

- PA-05 (Proportional gain Kp1)

  It decides the regulating intensity of the PID regulator. The higher the Kp1 is, the larger the regulating intensity is. The value 100.0 indicates when the deviation between PID feedback and PID setting is 100.0%, the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.

- PA-06 (Integral time Ti1)

  It decides the integral regulating intensity. The shorter the integral time is, the larger the regulating intensity is. When the deviation between PID feedback and PID setting is 100.0%, the integral regulator performs continuous adjustment for the time set in FA-06. Then the adjustment amplitude reaches the maximum frequency.

- PA-07 (Differential time Td1)

  It decides the regulating intensity of the PID regulator on the deviation change. The longer the differential time is, the larger the regulating intensity is. Differential time is the time within which the feedback value change reaches 100.0%, and then the adjustment amplitude reaches the maximum frequency.

Parameter No.	Parameter Name	Setting Range	Default
PA-08	Cut-off frequency of PID reverse rotation	0.00 to maximum frequency	2.00 Hz

In some situations, only when the PID output frequency is a negative value (AC drive reverse rotation), PID setting and PID feedback can be equal. However, too high reverse rotation frequency is prohibited in some applications, and FA-08 is used to determine the reverse rotation frequency upper limit.

Parameter No.	Parameter Name	Setting Range	Default
PA-09	PID deviation limit	0.0%–100.0%	0.0%

If the deviation between PID feedback and PID setting is smaller than the value of FA-09, PID control stops. The small deviation between PID feedback and PID setting will make the output frequency stabilize, effective for some closed-loop control applications.

Parameter No.	Parameter Name	Setting Range	Default
PA-10	PID differential limit	0.00%–100.00%	0.10%

It is used to set the PID differential output range. In PID control, the differential operation may easily cause system oscillation. Thus, the PID differential regulation is restricted to a small range.

Parameter No.	Parameter Name	Setting Range	Default
PA-11	PID setting change time	0.00–650.00s	0.00s

The PID setting change time indicates the time required for PID setting changing from 0.0% to 100.0%. The PID setting changes linearly according to the change time, reducing the impact caused by sudden setting change on the system.

Parameter No.	Parameter Name	Setting Range	Default
PA-12	PID feedback filter time	0.00–60.00s	0.00s
PA-13	PID output filter time	0.00–60.00s	0.00s

PA-12 is used to filter the PID feedback, helping to reduce interference on the feedback but slowing the response of the process closed-loop system.

PA-13 is used to filter the PID output frequency, helping to weaken sudden change of the AC drive output frequency but slowing the response of the process closed-loop system.

Parameter No.	Parameter Name	Setting Range	Default
PA-15	Proportional gain Kp2	0.0–100.0	20.0
PA-16	Integral time Ti2	0.01–10.00s	2.00s
PA-17	Differential time Td2	0.000–10.000s	0.000s
PA-18	PID parameter switchover condition	0: No switchover 1: Switchover via DI 2: Automatic switchover based on deviation	0
PA-19	PID parameter switchover deviation 1	0.0% to FA-20	20.0%
PA-20	PID parameter switchover deviation 2	FA-19 to 100.0%	80.0%

In some applications, PID parameters switchover is required when one group of PID parameters cannot satisfy the requirement of the whole running process.

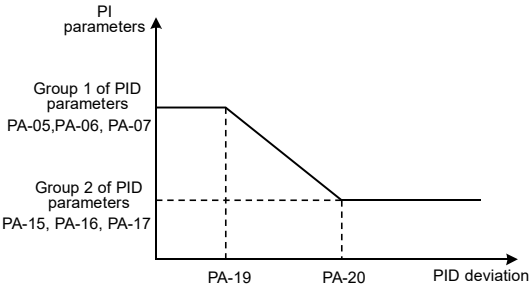
These parameters are used for switchover between two groups of PID parameters. Regulator parameters PA-15 to PA-17 are set in the same way as PA-05 to PA-07.

The switchover can be implemented either via a DI terminal or automatically implemented based on the deviation.

If you select switchover via a DI terminal, the DI must be allocated with function 43 "PID parameter switchover". If the DI is OFF, group 1 (PA-05 to PA-07) is selected. If the DI is ON, group 2 (PA-15 to PA-17) is selected.

If you select automatic switchover, when the absolute value of the deviation between PID feedback and PID setting is smaller than the value of PA-19, group 1 is selected. When the absolute value of the deviation between PID feedback and PID setting is higher than the value of PA-20, group 2 is selected. When the deviation is between PA-19 and PA-20, the PID parameters are the linear interpolated value of the two groups of parameter values.

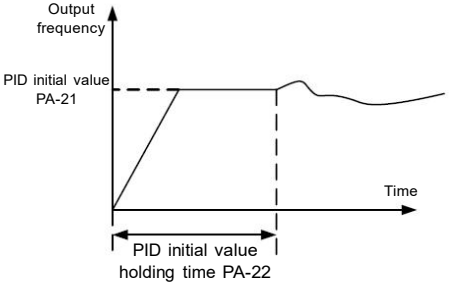
Figure 10-27 PID parameters switchover



Parameter No.	Parameter Name	Setting Range	Default
PA-21	PID initial value	0.0%–100.0%	0.0%
PA-22	PID initial value holding time	0.00–650.00s	0.00s

When the AC drive starts up, the PID starts closed-loop algorithm only after the PID output is fixed to the PID initial value (PA-21) and lasts the time set in PA-22.

Figure 10-28 PID initial value function



Parameter No.	Parameter Name	Setting Range	Default
PA-23	Maximum deviation between two PID outputs in forward direction	0.00%–100.00%	1.00%
PA-24	Maximum deviation between two PID outputs in reverse direction	0.00%–100.00%	1.00%

This function is used to limit the deviation between two PID outputs (2 ms per PID output) to suppress the rapid change of PID output and stabilize the running of the AC drive.

PA-23 and PA-24 respectively correspond to the maximum absolute value of the output deviation in forward direction and in reverse direction.

Parameter No.	Parameter Name	Setting Range	Default
PA-25	PID integral property	Ones position (Integral separated) 0: Invalid 1: Valid Tens position (Whether to stop integral operation when the output reaches the limit) 0: Continue integral operation 1: Stop integral operation	00

- Integral separated

  If it is set to valid, , the PID integral operation stops when the DI allocated with function 38 "PID integral pause" is ON In this case, only proportional and differential operations take effect.

  If it is set to invalid, integral separated remains invalid no matter whether the DI allocated with function 38 "PID integral pause" is ON or not.

- Whether to stop integral operation when the output reaches the limit

  If "Stop integral operation" is selected, the PID integral operation stops, which may help to reduce the PID overshoot.

Parameter No.	Parameter Name	Setting Range	Default
PA-26	Detection level of PID feedback loss	0.0%: Not judging feedback loss 0.1%–100.0%	0.0%
PA-27	Detection time of PID feedback loss	0.0–20.0s	0.0s

These parameters are used to judge whether PID feedback is lost.

If the PID feedback is smaller than the value of PA-26 and the lasting time exceeds the value of PA-27, the AC drive reports FU31 and acts according to the selected fault protection action.

Parameter No.	Parameter Name	Setting Range	Default
PA-28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	0

It is used to select whether to continue PID operation in the state of stop. Generally, the PID operation stops when the AC drive stops.

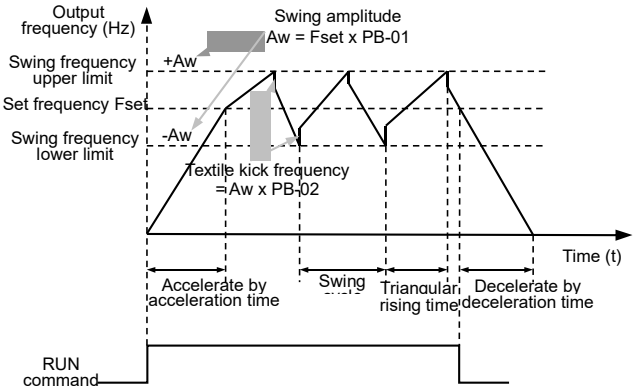
Group Pb: Swing Frequency, Fixed Length and Count

The swing frequency function is applied to the textile and chemical fiber fields and the applications where traversing and winding functions are required.

The swing frequency function indicates that the output frequency of the AC drive swings up and down with the set frequency as the center. The trace of running frequency at the time axis is shown in the following figure.

The swing amplitude is set in FB-00 and FB-01. When FB-01 is set to 0, the swing amplitude is 0 and the swing frequency does not take effect.

Figure 10-29 Swing frequency control



Parameter No.	Parameter Name	Setting Range	Default
Pb-00	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0

This parameter is used to select the base value of the swing amplitude.

- 0: Relative to the central frequency (P0-07 frequency source selection)

  It is variable swing amplitude system. The swing amplitude varies with the central frequency (set frequency).

- 1: Relative to the maximum frequency (P0-10 maximum output frequency) It is

  fixed swing amplitude system. The swing amplitude is fixed.

Parameter No.	Parameter Name	Setting Range	Default
Pb-01	Swing frequency amplitude	0.0%–100.0%	0.0%
Pb-02	Jump frequency amplitude	0.0%–50.0%	0.0%

This parameter is used to determine the swing amplitude and jump frequency amplitude. The swing frequency is limited by the frequency upper limit and frequency lower limit.

- If relative to the central frequency (PB-00 = 0), the actual swing amplitude AW is the calculation result of P0-07 (Frequency source selection) multiplied by Pb-01.
- If relative to the maximum frequency (PB-00 = 1), the actual swing amplitude AW is the calculation result of P0-10 (Maximum frequency) multiplied by Pb-01.

Jump frequency = Swing amplitude AW x Pb-02 (Jump frequency amplitude).

- If relative to the central frequency (Pb-00 = 0), the jump frequency is a variable value.
- If relative to the maximum frequency (Pb-00 = 1), the jump frequency is a fixed value.

The swing frequency is limited by the frequency upper limit and frequency lower limit.

Parameter No.	Parameter Name	Setting Range	Default
Pb-03	Swing frequency cycle	0.0–3000.0s	10.0s
Pb-04	Triangular wave rising time coefficient	0.0%–100.0%	50.0%

Pb-03 specifies the time of a complete swing frequency cycle.

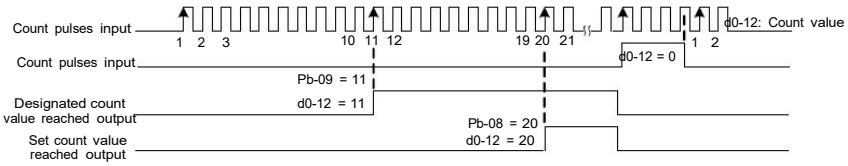
Pb-04 specifies the time percentage of triangular wave rising time to Pb-03 (Swing frequency cycle).

- Triangular wave rising time = Pb-03 (Swing frequency cycle) x Pb-04 (Triangular wave rising time coefficient, unit: s)
- Triangular wave falling time = Pb-03 (Swing frequency cycle) x (1 –Pb-04 Triangular wave rising time coefficient ,unit: s)

Parameter No.	Parameter Name	Setting Range	Default
Pb-05	Set length	0–65535 m	1000 m
Pb-06	Actual length	0–65535 m	0 m
Pb-07	Number of pulses per meter	0.1–6553.5	100.0

Parameter No.	Parameter Name	Setting Range	Default
Pb-08	Set count value	1–65535	1000
Pb-09	Designated count value	1–65535	1000

Figure 10-30 Reaching the set count value and designated count value



Group PC: Multi-Reference and Simple PLC Function

The EV200 multi-reference has many functions. Besides multi-speed, it can be used as the setting source of the V/F separated voltage source and setting source of process PID. In addition, the multi-reference is relative value.

Parameter No.	Parameter Name	Setting Range	Default
PC-00	Reference 0	-100.0%–100.0%	0.0%
PC-01	Reference 1	-100.0%–100.0%	0.0%
PC-02	Reference 2	-100.0%–100.0%	0.0%
PC-03	Reference 3	-100.0%–100.0%	0.0%
PC-04	Reference 4	-100.0%–100.0%	0.0%
PC-05	Reference 5	-100.0%–100.0%	0.0%
PC-06	Reference 6	-100.0%–100.0%	0.0%
PC-07	Reference 7	-100.0%–100.0%	0.0%
PC-08	Reference 8	-100.0%–100.0%	0.0%
PC-09	Reference 9	-100.0%–100.0%	0.0%
PC-10	Reference 10	-100.0%–100.0%	0.0%
PC-11	Reference 11	-100.0%–100.0%	0.0%
PC-12	Reference 12	-100.0%–100.0%	0.0%
PC-13	Reference 13	-100.0%–100.0%	0.0%
PC-14	Reference 14	-100.0%–100.0%	0.0%
PC-15	Reference 15	-100.0%–100.0%	0.0%

Multi-reference can be the setting source of frequency, V/F separated voltage and process PID. The multi-reference is relative value and ranges from -100.0% to 100.0%.

As frequency source, it is a percentage relative to the maximum frequency. As V/F separated voltage source, it is a percentage relative to the rated motor voltage. As process PID setting source, it does not require conversion.

Multi-reference can be switched over based on different states of S terminals. For details, see the descriptions of group P4.

Parameter No.	Parameter Name	Setting Range	Default
PC-16	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive runs one cycle	0

- 0: Stop after the AC drive runs one cycle

  The AC drive stops after running one cycle, and will not start up until receiving another command.

- 1: Keep final values after the AC drive runs one cycle

  The AC drive keeps the final running frequency and direction after running one cycle.

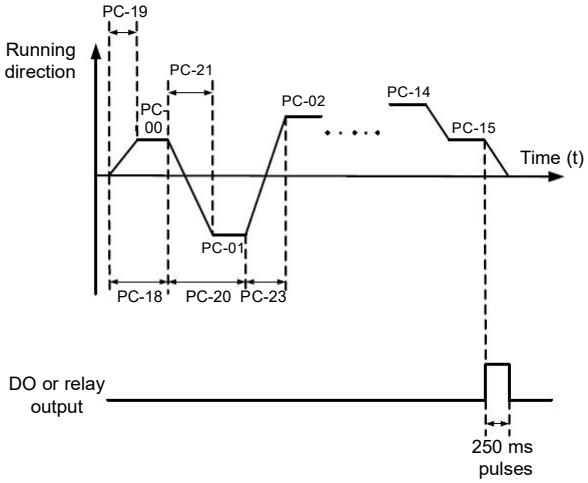
- 2: Repeat after the AC drive runs one cycle

  The AC drive automatically starts another cycle after running one cycle, and will not stop until receiving the stop command.

Simple PLC can be either the frequency source or V/F separated voltage source.

When simple PLC is used as the frequency source, whether parameter values of PC-00 to PC-15 are positive or negative determines the running direction. If the parameter values are negative, it indicates that the AC drive runs in reverse direction.

Figure 10-31 Simple PLC when used as frequency source



Parameter No.	Parameter Name	Setting Range	Default
PC-17	Simple PLC retentive selection	Ones position (Retentive upon power failure) 0: No 1: Yes Tens position (Retentive upon stop) 0: No 1: Yes	00

PLC retentive upon power failure indicates that the AC drive memorizes the PLC running moment and running frequency before power failure and will continue to run from the memorized moment after it is powered on again. If the Ones position is set to 0, the AC drive restarts the PLC process after it is powered on again.

PLC retentive upon stop indicates that the AC drive records the PLC running moment and running frequency upon stop and will continue to run from the recorded moment after it starts up again. If the Tens position is set to 0, the AC drive restarts the PLC process after it starts up again.

Parameter No.	Parameter Name	Setting Range	Default
PC-18	Running time of simple PLC reference 0	0.0–6553.5s (h)	0.0s (h)
PC-19	Acceleration/deceleration time of simple PLC reference 0	0–3	0
PC-20	Running time of simple PLC reference 1	0.0–6553.5s (h)	0.0s (h)
PC-21	Acceleration/deceleration time of simple PLC reference 1	0–3	0
PC-22	Running time of simple PLC reference 2	0.0–6553.5s (h)	0.0s (h)
PC-23	Acceleration/deceleration time of simple PLC reference 2	0–3	0
PC-24	Running time of simple PLC reference 3	0.0–6553.5s (h)	0.0s (h)
PC-25	Acceleration/deceleration time of simple PLC reference 3	0–3	0
PC-26	Running time of simple PLC reference 4	0.0–6553.5s (h)	0.0s (h)
PC-27	Acceleration/deceleration time of simple PLC reference 4	0–3	0
PC-28	Running time of simple PLC reference 5	0.0–6553.5s (h)	0.0s (h)
PC-29	Acceleration/deceleration time of simple PLC reference 5	0–3	0
PC-30	Running time of simple PLC reference 6	0.0–6553.5s (h)	0.0s (h)
PC-31	Acceleration/deceleration time of simple PLC reference 6	0–3	0
PC-32	Running time of simple PLC reference 7	0.0–6553.5s (h)	0.0s (h)
PC-33	Acceleration/deceleration time of simple PLC reference 7	0–3	0

Parameter No.	Parameter Name	Setting Range	Default
PC-34	Running time of simple PLC reference 8	0.0–6553.5s (h)	0.0s (h)
PC-35	Acceleration/deceleration time of simple PLC reference 8	0–3	0
PC-36	Running time of simple PLC reference 9	0.0–6553.5s (h)	0.0s (h)
PC-37	Acceleration/deceleration time of simple PLC reference 9	0–3	0
PC-38	Running time of simple PLC reference 10	0.0–6553.5s (h)	0.0s (h)
PC-39	Acceleration/deceleration time of simple PLC reference 10	0–3	0
PC-40	Running time of simple PLC reference 11	0.0–6553.5s (h)	0.0s (h)
PC-41	Acceleration/deceleration time of simple PLC reference 11	0–3	0
PC-42	Running time of simple PLC reference 12	0.0–6553.5s (h)	0.0s (h)
PC-43	Acceleration/deceleration time of simple PLC reference 12	0–3	0
PC-44	Running time of simple PLC reference 13	0.0–6553.5s (h)	0.0s (h)
PC-45	Acceleration/deceleration time of simple PLC reference 13	0–3	0
PC-46	Running time of simple PLC reference 14	0.0–6553.5s (h)	0.0s (h)
PC-47	Acceleration/deceleration time of simple PLC reference 14	0–3	0
PC-48	Running time of simple PLC reference 15	0.0–6553.5s (h)	0.0s (h)
PC-49	Acceleration/deceleration time of simple PLC reference 15	0–3	0
PC-50	Time unit of simple PLC running	0: s (second) 1: h (hour)	0

Parameter No.	Parameter Name	Setting Range	Default
PC-51	Reference 0 source	0: Set by PC-00 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: PID 6: Set by preset frequency (F0-08), modified via terminal UP/DOWN	0

It determines the setting channel of reference 0. You can perform convenient switchover between the setting channels. When multi-reference or simple PLC is used as frequency source, the switchover between two frequency sources can be realized easily.

Group PE: User-Defined Parameters

Parameter No.	Parameter Name	Setting Range	Default
PE-00	User-defined parameter 0	P0-00 to PP-xx, A0-00 to Ax-xx,d0-xx	d3-17
PE-01	User-defined parameter 1	Same as PE-00	d3-18
PE-02	User-defined parameter 2	Same as PE-00	P0-00
PE-03	User-defined parameter 3	Same as PE-00	P0-00
PE-04	User-defined parameter 4	Same as PE-00	P0-00
PE-05	User-defined parameter 5	Same as PE-00	P0-00
PE-06	User-defined parameter 6	Same as PE-00	P0-00
PE-07	User-defined parameter 7	Same as PE-00	P0-00
PE-08	User-defined parameter 8	Same as PE-00	P0-00
PE-09	User-defined parameter 9	Same as PE-00	P0-00
PE-10	User-defined parameter 10	Same as PE-00	P0-00
PE-11	User-defined parameter 11	Same as PE-00	P0-00
PE-12	User-defined parameter 12	Same as PE-00	P0-00
PE-13	User-defined parameter 13	Same as PE-00	P0-00
PE-14	User-defined parameter 14	Same as PE-00	P0-00
PE-15	User-defined parameter 15	Same as PE-00	P0-00
PE-16	User-defined parameter 16	Same as PE-00	P0-00
PE-17	User-defined parameter 17	Same as PE-00	P0-00
PE-18	User-defined parameter 18	Same as PE-00	P0-00
PE-19	User-defined parameter 19	Same as PE-00	P0-00
PE-20	User-defined parameter 20	Same as PE-00	P0-00
PE-21	User-defined parameter 21	Same as PE-00	P0-00
PE-22	User-defined parameter 22	Same as PE-00	P0-00
PE-23	User-defined parameter 23	Same as PE-00	P0-00
PE-24	User-defined parameter 24	Same as PE-00	P0-00
PE-25	User-defined parameter 25	Same as PE-00	P0-00
PE-26	User-defined parameter 26	Same as PE-00	P0-00
PE-27	User-defined parameter 27	Same as PE-00	P0-00
PE-28	User-defined parameter 28	Same as PE-00	P0-00
PE-29	User-defined parameter 29	Same as PE-00	P0-00

PE is user-defined parameter group. You can select the required parameters from all EV200 functions codes and add them into this group, convenient for view and modification.

Group PE provides a maximum of 30 user-defined parameters. If "PE-00" is displayed, it indicates that group PE is null. After you enter user-defined parameter mode, the displayed parameters are defined by PE-00 to PE-31 and the sequence is consistent with that in group PE.

Group PP: User Password

Parameter No.	Parameter Name	Setting Range	Default
PP-00	User password	0–65535	0

If it is set to any non-zero number, the password protection function is enabled. After a password has been set and taken effect, you must enter the correct password in order to enter the menu. If the entered password is incorrect you cannot view or modify parameters.

If PP-00 is set to 00000, the previously set user password is cleared, and the password protection function is disabled.

Parameter No.	Parameter Name	Setting Range	Default
PP-01	Restore default settings	0: No operation 1: Restore factory settings except motor parameters 2: Clear records 4: Restore user backup parameters 501: Back up current user parameters	0

- 1: Restore default settings except motor parameters

  If PP-01 is set to 1, most parameters are restored to the default settings except motor parameters, frequency reference resolution (P0-22), fault records, accumulative running time (P7-09), accumulative power-on time (P7-13) and accumulative power consumption (P7-14).

- 2: Clear records

  If PP-01 is set to 2, the fault records, accumulative running time (P7-09), accumulative power-on time (FP7-13) and accumulative power consumption (P7-14) are cleared.

- 501: Back up current user parameters

  If PP-01 is set to 501, the current parameter settings are backed up, helping you to restore the setting if incorrect parameter setting is performed.

- 4: Restore user backup parameters

  If PP-01 is set to 4, the previous backup user parameters are restored.

Parameter No.	Parameter Name	Setting Range	Default
PP-02	AC drive parameter display property	Ones position (Group d display selection)	11
		0: Not display 1: Display	
		Tens position (Group A display selection)	
		0: Not display 1: Display	
PP-03	Individualized parameter display property	Ones position (User-defined parameter display selection)	00
		0: Not display 1: Display	
		Tens position (User-modified parameter display selection)	
		0: Not display 1: Display	

The setting of parameter display mode aims to facilitate you to view different types of parameters based on actual requirements. The EV200 provides the following three parameter display modes.

Table 10-7 Three parameter display modes provided by EV200

Name	Description
AC drive parameter display	Display parameters of the AC drive in sequence of P0 to PF, A0 to AF and d0 to dF.
User-defined parameter display	Display a maximum of 32 user-defined parameters included in group PE.
User-modified parameter display	Display the parameters that are modified.

Parameter No.	Name	Setting Range	Default
PP-04	Parameter modification property	0: Modifiable 1: Not modifiable	0

It is used to set whether the parameters are modifiable to avoid mal-function. If it is set to 0, all parameters are modifiable. If it is set to 1, all parameters can only be viewed.

Group A0: Torque Control and Limit

Parameter No.	Parameter Name	Setting Range	Default
A0-00	Speed/Torque control selection	0: Speed control 1: Torque control	0

It is used to select the AC drive's control mode: speed control or torque control.

The EV200 provides DI terminals with two torque related functions, function 29 (Torque control prohibited) and function 46 (Speed control/Torque control switchover). The two DI terminals need to be used together with A0-00 to implement speed control/torque control switchover.

If the DI terminal allocated with function 46 (Speed control/Torque control switchover) is OFF, the control mode is determined by A0-00. If the DI terminal allocated with function 46 is ON, the control mode is reverse to the value of A0-00.

However, if the DI terminal with function 29 (Torque control prohibited) is ON, the AC drive is fixed to run in the speed control mode.

Parameter No.	Parameter Name	Setting Range	Default
A0-01	Torque setting source in torque control	0: Digital setting (A0-03) 1: AI1 2: AI2 3: AI3 4: Pulse setting (S5) 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2)	0
A0-03	Torque digital setting in torque control	-200.0%–+200.0%	150.0%

A0-01 is used to set the torque setting source. There are a total of eight torque setting sources.

The torque setting is a relative value. 100.0% corresponds to the AC drive's rated torque. The setting range is -200.0% to 200.0%, indicating the AC drive's maximum torque is twice of the AC drive's rated torque.

If the torque setting is positive, the AC drive rotates in forward direction. If the torque setting is negative, the AC drive rotates in reverse direction.

- 0: Digital setting (A0-03)

  The target torque directly uses the value set in A0-03.

- 1: AI1
- 2: AI2
- 3: AI3

  The target torque is decided by analog input. The EV200 control board provides one AI terminals .When AI is used as frequency setting source, the corresponding value 100% of voltage/current input corresponds to the value of A0-03.

- 4:Pulse setting (S5)
- 5: Communication setting
- 6: CMIN (AI1, AI2)
- 7: MAX (AI1, AI2)

Parameter No.	Parameter Name	Setting Range	Default
A0-05	Forward maximum frequency in torque control	0.00 Hz to maximum frequency (F0-10)	50.00 Hz
A0-06	Reverse maximum frequency in torque control	0.00 Hz to maximum frequency (F0-10)	50.00 Hz

two parameters are used to set the maximum frequency in forward or reverse rotation in torque control mode.

In torque control, if the load torque is smaller than the motor output torque, the motor's rotational speed will rise continuously. To avoid runaway of the mechanical system, the motor maximum rotating speed must be limited in torque control.

You can implement continuous change of the maximum frequency in torque control dynamically by controlling the frequency upper limit.

Parameter No.	Parameter Name	Setting Range	Default
A0-07	Acceleration time in torque control	0.00–65000s	0.00s
A0-08	Deceleration time in torque control	0.00–65000s	0.00s

In torque control, the difference between the motor output torque and the load torque determines the speed change rate of the motor and load. The motor rotational speed may change quickly and this will result in noise or too large mechanical stress. The setting of acceleration/deceleration time in torque control makes the motor rotational speed change softly.

However, in applications requiring rapid torque response, set the acceleration/deceleration time in torque control to 0.00s. For example, two AC drives are connected to drive the same load. To balance the load allocation, set one AC drive as master in speed control and the other as slave in torque control. The slave receives the master's output torque as the torque command and must follow the master rapidly. In this case, the acceleration/deceleration time of the slave in torque control is set to 0.0s.

Parameter No.	Parameter Name	Setting Range	Default
A2-47	Torque upper limit source in speed control mode	0: A2-48 1: AI1 2: AI2 3: AI3 4: Pulse setting (S5) 5: Via communication 6: MIN(AI1,AI2) 7: MIN(AI1,AI2)	0

Group A5: Control Optimization Parameters

Parameter No.	Parameter Name	Setting Range	Default
A5-00	DPWM switchover frequency upper limit	0.00–15.00 Hz	12.00 Hz

This parameter is valid only for V/F control.

It is used to determine the wave modulation mode in V/F control of asynchronous motor. If the frequency is lower than the value of this parameter, the waveform is 7-segment continuous modulation. If the frequency is higher than the value of this parameter, the waveform is 5-segment intermittent modulation.

The 7-segment continuous modulation causes more loss to switches of the AC drive but smaller current ripple. The 5-segment intermittent modulation causes less loss to switches of the AC drive but larger current ripple. This may lead to motor running instability at high frequency. Do not modify this parameter generally.

For instability of V/F control, refer to parameter P3-11.

Parameter No.	Parameter Name	Setting Range	Default
A5-01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0

This parameter is valid only for V/F control.

Synchronous modulation indicates that the carrier frequency varies linearly with the change of the output frequency, ensuring that the ratio of carrier frequency to output frequency remains unchanged. Synchronous modulation is generally used at high output frequency, which helps improve the output voltage quality.

At low output frequency (100 Hz or lower), synchronous modulation is not required. This is because asynchronous modulation is preferred when the ratio of carrier frequency to output frequency is high.

Synchronous modulation takes effect only when the running frequency is higher than 85 Hz. If the frequency is lower than 85 Hz, asynchronous modulation is always used.

Parameter No.	Parameter Name	Setting Range	Default
A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1	1

Generally, you need not modify this parameter. Try to use a different compensation mode only when there is special requirement on the output voltage waveform quality or oscillation occurs on the motor.

For high power AC drive, compensation mode 2 is recommended.

Parameter No.	Parameter Name	Setting Range	Default
A5-03	Random PWM depth	0: Random PWM invalid 1–10	0

The setting of random PWM depth can make the shrill motor noise softer and reduce the electromagnetic interference. If this parameter is set to 0, random PWM is invalid.

Parameter No.	Parameter Name	Setting Range	Default
A5-04	Rapid current limit	0: Disabled 1: Enabled	1

The rapid current limit function can reduce the AC drive's overcurrent faults at maximum, guaranteeing uninterrupted running of the AC drive.

However, long-time rapid current limit may cause the AC drive to overheat, which is not allowed. In this case, the AC drive will report FU40, indicating the AC drive is overloaded and needs to stop.

Parameter No.	Parameter Name	Setting Range	Default
A5-05	Current detection compensation	0–100	5

It is used to set the AC drive current detection compensation. Too large value may lead to deterioration of control performance. Do not modify it generally.

Parameter No.	Parameter Name	Setting Range	Default
A5-06	Under voltage threshold	60.0%–140.0%	100.0%

It is used to set the under voltage threshold of FU09. The under voltage threshold 100% of the AC drive of different voltage classes corresponds to different nominal values, as listed in the following table.

Table 10-8 Undervoltage nominal values for different voltage

Voltage Class	Nominal Value of Undervoltage threshold
Single-phase 220 V	200 V
Three-phase 220 V	200 V
Three-phase 380 V	350 V
Three-phase 480 V	450 V
Three-phase 690 V	650 V

Parameter No.	Parameter Name	Setting Range	Default
A5-07	SFVC optimization mode selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1

- 1: Optimization mode 1

  It is used when the requirement on torque control linearity is high.

- 2: Optimization mode 2

  It is used for the requirement on speed stability is high.

Parameter No.	Parameter Name	Setting Range	Default
A5-08	Dead-zone time adjustment	100%–200%	150%

It is only valid for 1140 V voltage class.

You can modify the value of this parameter to improve the voltage utilization rate. Too small value may system instability. Do not modify it generally.

Parameter No.	Parameter Name	Setting Range	Default
A5-09	Over voltage threshold	200.0–2500.0 V	2000.0 V

It is used to set the over voltage threshold of the AC drive. The default values of different voltage classes are listed in the following table.
Table 10-9 Overvoltage thresholds for different voltage classes

Voltage Class	Default Overvoltage Threshold
Single-phase 220 V	400.0 V
Three-phase 220 V	400.0 V
Three-phase 380 V	810.0 V
Three-phase 480 V	890.0 V
Three-phase 690 V	1300.0 V

Note

The default value is also the upper limit of the AC drive's internal over voltage protection voltage. The parameter becomes effective only when the setting of A5-09 is lower than the default value. If the setting is higher than the default value, use the default value.

Group A6: AI Curve Setting

Parameter No.	Name	Setting Range	Default
A6-00	AI curve 4 minimum input	-10.00 V to A6-02	0.00 V
A6-01	Corresponding setting of AI curve 4 minimum input	-100.0%–100.0%	0.0%
A6-02	AI curve 4 inflexion 1 input	A6-00 to A6-04	3.00 V

Parameter No.	Name	Setting Range	Default
A6-15	Corresponding setting of AI curve 5 maximum input	-100.0%–100.0%	100.0%

Parameter No.	Parameter Name	Setting Range	Default
A6-24	Jump point of AI1 input corresponding setting	-100.0%–100.0%	0.0%

The AI terminals of the EV200 all support the corresponding setting jump function, which fixes the AI input corresponding setting at the jump point when AI input corresponding setting jumps around the jump range.

For example, AI1 input voltage jumps around 5.00 V and the jump range is 4.90–5.10 V. AI1 minimum input 0.00 V corresponds to 0.0% and maximum input 10.00 V corresponds to 100.0%. The detected AI1 input corresponding setting varies between 49.0% and 51.0%.

If you set A6-24 to 50.0% and A6-25 to 1.0%, then the obtained AI1 input corresponding setting is fixed to 50.0%, eliminating the fluctuation effect.

Group AC: AI/AO Correction

Parameter No.	Parameter Name	Setting Range	Default
AC-00	AI1 measured voltage 1	0.500–4.000 V	Factory-corrected
AC-01	AI1 displayed voltage 1	0.500–4.000 V	Factory-corrected
AC-02	AI1 measured voltage 2	6.000–9.999 V	Factory-corrected
AC-03	AI1 displayed voltage 2	6.000–9.999 V	Factory-corrected

These parameters are used to correct the AI to eliminate the impact of AI zero offset and gain.

They have been corrected upon delivery. When you resume the factory values, these parameters will be restored to the factory-corrected values. Generally, you need not perform correction in the applications.

Measured voltage indicates the actual output voltage value measured by instruments such as the multimeter. Displayed voltage indicates the voltage display value sampled by the AC drive. For details, refer to d0-21, d0-22 and d0-23.

During correction, send two voltage values to each AI terminal, and save the measured values and displayed values to the parameters AC-00 to AC-03. Then the AC drive will automatically perform AI zero offset and gain correction.

If the input voltage and the actual voltage sampled by the AC drive are inconsistent, perform correction on site. Take AI1 as an example. The on-site correction is as follows:

1) Send a voltage signal (approximately 2 V) to AI1.
2) Measure the AI1 voltage and save it to AC-00.
3) View the displayed value of U0-21 and save the value to AC-01.
4) Send a voltage signal (approximately 8 V) to AI1.
5) Measure AI1 voltage and save it to AC-02.
6) View the displayed value of d0-21 and save the value to AC-03.

Group d0: Monitoring Parameters

Group U0 is used to monitor the AC drive's running state. You can view the parameter values by using operating panel, convenient for on-site commissioning, or from the host controller by means of communication (address: 0x7000-0x701A).

d0-00 to d0-26 are the monitoring parameters in the running and stop state defined by P7-03 and P7-04.

Parameter No.	Parameter Name	Display Range
d0-00	Running frequency	0.00–320.00 Hz (F0-22 = 2)
d0-01	Set frequency	0.00–3200.0 Hz (F0-22 = 1)

These two parameters display the absolute value of theoretical running frequency and set frequency. For the actual output frequency of the AC drive, see d0-19.

Parameter No.	Parameter Name	Display Range
d0-02	Bus voltage	0.0–3000.0 V

It displays the AC drive's bus voltage.

Parameter No.	Parameter Name	Display Range
d0-03	Output voltage	0–1140 V

It displays the AC drive's output voltage in the running state.

Parameter No.	Parameter Name	Display Range
d0-04	Output current	0.00–655.35 A 0.0–6553.5 A

It displays the AC drive's output current in the running state.

Parameter No.	Name	Display Range
d0-05	Output power	0–32767

It displays the AC drive's output power in the running state.

Parameter No.	Parameter Name	Display Range
d0-06	Output torque	-200.0%–200.0%

It displays the AC drive's output torque in the running state.

Parameter No.	Parameter Name	Display Range
d0-07	DI state	0–32767

It displays the current state of S terminals. After the value is converted into a binary number, each bit corresponds to a S. "1" indicates high level signal, and "0" indicates low level signal. The corresponding relationship between bits and Ss is described in the following table.

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8	Bit9
S1	S2	S3	S4	S5	DI6	DI7	DI8	DI9	DI10
Bit10	Bit11	Bit12	Bit13	Bit10	Bit11	Bit12	Bit13	Bit14	Bit15
VDI1	VDI2	VDI3	VDI4	VDI1	VDI2	VDI3	VDI4	VS5	

Parameter	Parameter Name	Display Range
d0-08	DO state	0–1023

It indicates the current state of DO terminals. After the value is converted into a binary number, each bit corresponds to a DO. "1" indicates high level signal, and "0" indicates low level signal. The corresponding relationship between bits and DOs is described in the following table.

Table 10-10 Corresponding relationship between bits and DOs

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5
DO3	Relay 1	Relay 2	DO1	DO2	VDO1
Bit6	Bit7	Bit8	Bit9	Bit10	Bit11
VDO2	VDO3	VDO4	VDO5		

Parameter No.	Parameter Name	Display Range
D0-10	AI2 voltage (V)/current (mA)	0.00–10.57 V 0.00–20.00 mA

When P4-40 is set to 0, AI2 samplin g data is displayed in the unit of V. When

P4-40 is set to 1, AI2 sampling data is displayed in the unit of mA.

Parameter No.	Parameter Name	Display Range
d0-14	Load speed	0–65535

For more details, see the description of P7-12.

Parameter No.	Parameter Name	Display Range
d0-15	PID setting	0–65535
d0-16	PID feedback	0–65535

They display the PID setting value and PID feedback value.

- PID setting = PID setting (percentage) x PA-04
- PID feedback = PID feedback (percentage) x PA-04

Parameter No.	Parameter Name	Display Range
d0-18	Input pulse frequency	0.00–100.00 kHz

It displays the high-speed pulse sampled frequency of S5, in minimum unit of 0.01 kHz.

Parameter No.	Parameter Name	Display Range
d0-19	Feedback speed	-320.00–320.00 Hz -3200.0–3200.0 Hz

It displays the actual output frequency of the AC drive.

- If P0-22 (Frequency reference resolution) is set to 1, the display range is -3200.00–3200.00 Hz.
- If P0-22 (Frequency reference resolution) is set to 2, the display range is -320.00Hz–320.00 Hz.

Parameter No.	Parameter Name	Display Range
d0-20	Remaining running time	0.0–6500.0 min

It displays the remaining running time when the timing operation is enabled. For details on timing operation, refer to P8-42 to P8-44.

Parameter No.	Parameter Name	Display Range
d0-21	AI1 voltage before correction	0.00–10.57 V
d0-22	AI2 voltage (V)/ current (mA) before correction	0.00–10.57 V 0.00–20.00 mA
d0-23	AI3 voltage before correction	-10.57–10.57 V

They display the AI sampleding voltage/current value of AI. The actually used voltage/ current is obtained after linear correction to reduce the deviation between the sampled voltage/current and the actual input voltage/current.

For actual corrected voltage, see d0-09, d0-10 and d0-11. Refer to group AC for the correction mode.

Parameter No.	Parameter Name	Display Range
d0-24	Linear speed	0–65535 m/min

It displays the linear speed of the S5 high-speed pulse sampling. The unit is meter/minute. The linear speed is obtained according to the actual number of pulses sampled per minute and Pb-07 (Number of pulses per meter).

11.Fault Display

When a fault occurs during running, The operation panel displays the fault code such as shown in the following figure.

Fault	Display	Fault Reason	Error Settlement
Over current during acceleration	FU02	Ground fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is FVC or SVC but motor auto-tuning is not performed.	Set motor parameters according to motor nameplate and perform motor auto-tuning.
		Acceleration time is too short.	Increase acceleration time.
		The over current stall prevention parameters are set improperly.	Ensure that current limit is enabled (P3-19 = 1). The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. The setting of current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		Customized torque boost or V/F curve is not appropriate.	Adjust the customizedtorque boost or V/F curve.
		The spinning motor is started.	Enable the catching a spinning motor function or start the motor after it stops.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board hall device problem.
Over current during deceleration	FU03	Ground fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	Set the motor parameters according to the motor nameplate and perform motor auto-tuning.

Fault	Display	Fault Reason	Error Settlement
		Acceleration time is too short.	Increase acceleration time.
		The over current stall prevention parameters are set improperly.	Ensure that current limit is enabled (p3-19 = 1) The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. The setting of the current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		Braking unit and braking resistor are not installed.	Install braking unit and braking resistor.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over current At constant speed	FU04	Ground fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	Set motor parameters according to motor nameplate and perform motor auto-tuning.
		The over current stall prevention parameters are set improperly.	Ensure that current limit is enabled (P3-19). The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. The setting of current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		The AC drive power class Is small.	If output current exceeds rated motor current or rated output current of the AC drive during stable running, replace a drive of larger power class.

Fault	Display	Fault Reason	Error Settlement
		The drive suffers external interference.	View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over voltage during acceleration	FU05	Input voltage is too high.	Adjust input voltage to normal range.
		An external force drives motor during acceleration.	Cancel the external force or install a braking resistor.
		The over voltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (P3-23). The setting of voltage limit (P3-22) is too large. Adjust it between700V and 770V. The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50.
		Braking unit and braking resistor are not installed.	Install braking unit and braking resistor.
		Acceleration time is too short.	Increase acceleration time.
Over voltage during deceleration	FU06	The over voltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (P3-23). The setting of voltage limit (P3-22) is too large. Adjust it between 700 V and 770V. The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50.
		An external force drives motor during deceleration.	Cancel the external force or install braking resistor.
		Deceleration time is too short.	Increase deceleration time.
		Braking unit and braking resistor are not installed.	Install braking unit and braking resistor.
Over voltage at constant speed	FU07	The over voltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (P3-23) The setting of voltage limit (P3-22) is too large. Adjust

Fault	Display	Fault Reason	Error Settlement
			it between 700V and 770V. The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50. The setting of frequency rise threshold during voltage limit (P3-26) is too small. Adjust it between 5Hz and 20 Hz.
		An external force drives motor during running.	Cancel the external force or install a braking resistor
Pre-charge resistor fault	FU08	Input voltageis not in arranged range	Arrange voltage in a reasonable range
Under voltage	FU09	Instantaneous power failure occurs	Enable the power dip ride through function (P9-59).
		The AC drive's input voltage is not within the permissible range.	Adjust the voltage to normal range.
		The bus voltage is abnormal.	Contact the agent or Inovance.
		The rectifier bridge, the buffer resistor, the drive board or the control board are abnormal.	Contact theagent or Inovance.
AC drive overload	FU10	Load is too heavy or locked- rotor occurs on motor.	Reduce load or check motor and mechanical conditions.
		The AC drive power Class is small.	Replace a drive of larger power class.
Motor overload	FU11	P9-01 (Motor overload protection gain) is set improperly.	Set P9-01 correctly.
		Load is too heavy or locked- rotor occurs on motor.	Reduce load or check motor and mechanical conditions.
Output phase loss	FU13	Motor winding is damaged.	Check resistance between motor wires. Replace motor is winding is damaged.
		The cable connecting the AC drive and the motor is abnormal.	Check for wiring errors and ensure the output cable is connected properly Correct wiring.
		The AC drive's three-phase outputs are unbalanced when the motor is running.	Check whether the motor three-phase winding is normal.

Fault	Display	Fault Reason	Error Settlement
		The drive board or the IGBT is abnormal.	Contact the agent or Inovance.
overheat	FU14	The ambient temperature Is too high.	Lower the ambient temperature.
		The ventilation is clogged.	Clean the ventilation.
		The fan is damaged.	Replace the cooling fan.
		Thermally sensitive resistor of IGBT is damaged.	Replace the damaged thermally sensitive resistor.
		The AC Drive Inverter module is damaged.	Replace the AC Drive Inverter module.
Out project fault	FU15	External fault signal is input via S.	Confirm that the mechanical condition allows restart (P8-18) and reset the operation.
Communication fault	FU16	Host computer is in abnormal state.	Check the cable of host computer.
		Communication cable is abnormal.	Check the communication cables.
		The serial port communication protocol (P0-28) of extension communication card is set improperly.	Set extension communication card correctly.
		Communication parameters in group Pd are set improperly.	Set communication parameters in group Pd properly.
		After all the preceding checking are done but the fault still exists, restore the default settings.	
Contactor fault	FU17	Drive board and power Supply are abnormal.	Replace drive board or power supply board.
		Contactor is abnormal.	Replace contactor.
		The lightning protection board is abnormal.	Replace the lightning protection board.
Current detection failure	FU18	The hall is abnormal.	Replace the hall .
		The drive board is abnormal.	Replace the drive board.
Motor self learning malfunction	FU19	Motor parameters are not set according to nameplate.	Set motor parameters correctly according to nameplate.

Fault	Display	Fault Reason	Error Settlement
		Motor auto-tuning times out.	Check the cable connecting AC drive and motor.
		The encoder is abnormal.	Check whether P1-27 (encoder pulses per revolution) is set correctly.Check whether signal lines of encoder are connected correctly and securely.
Encoder fault	FU20	Encoder is not matched.	Set the type of encoder correctly.
		Encoder wiring is incorrect.	Check the PG card power supply and phase sequence.
		Encoder is damaged.	Replace encoder.
		PG card is abnormal.	Replace PG card.
EEPROM read-write fault	FU21	The EEPROM chip Is damaged.	Replace the main control board.
Short circuit to ground	FU23	Motor is short circuited to the ground.	Replace cable or motor.
Accumulative running time reached	FU26	Accumulative running time reaches the setting value.	Clear the record through parameter initialization.
User-defined fault 1	FU27	User-defined fault 1 is input Via S.	Reset the operation.
User-defined fault 2	FU28	User-defined fault 2 is input Via virtual S	Reset the operation.
Accumulative power reach error	FU29	Accumulative power-on time reached	Use the parameter initialization function to clear the record information
Load loss	FU30	Working current < P9-64	Check whether the load is off or P9-64, P9-65 parameter set Whether to meet the actual operating conditions
PID feedback lost during running	FU31	PID feedback < PA-26 set value	Check PID feedback or set PA-26 properly.
Pulse-by-puls e current limit fault	FU40	Load is too heavy or locked- rotor occurs on motor.	Reduce load or check motor and mechanical conditions

Fault	Display	Fault Reason	Error Settlement
		The AC drive power class is small.	Replace a drive of larger power class.
Motor switchover fault during running	FU41	Motor switchover via terminal during drive running of the AC drive.	Perform motor switchover after the AC drive stops.
Speed error	FU42	Encoder parameters are set improperly.	Set encoder parametersproperly.
		Motor auto-tuning is not performed.	Perform motor auto-tuning.
		P9-69 (detection level of speed error) and P9-70 (detection time of speed error) are set incorrectly.	Set data correctly based on actual condition
Motor over speed	FU43	Encoder parameters are set improperly.	Set encoder parametersproperly.
		Motor auto-tuning is not performed.	Perform motor auto-tuning.
		P9-67 (Over speed detection level) and P9-68 (Over speed detection time) are set incorrectly.	Set data correctly based on the actual situation.