HDv-E630 -Series

Variable Frequency Drive (VFD)

Instruction Manual

August 2025 V1.00
ATC/IHDv2510

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※ Preface

Thank you for purchasing and using the E630-Series Variable Frequency Drive (VFD) independently developed and manufactured by Hechuan Technology Co., Ltd.

This manual will provide a brief description of the products in the table:

Name	Operating voltage	E630-Series model	Power
E630-Series VFD	Single-Phase 220V~240V*2	HDv-E630-2S0.7B-000	750W
		HDv-E630-2S1.5B-000	1.5kW
		HDv-E630-2S2.2B-000	2.2kW
	Three-Phase 380V~480V	HDv-E630-4T0.7B-000*2	750W
		HDv-E630-4T1.5B-000*2	1.5kW
		HDv-E630-4T2.2B-000*2	2.2kW
		HDv-E630-4T3.7B-000*2	3.7kW
		HDv-E630-4T5.5B-000*2	5.5kW
		HDv-E630-4T7.5B-000*2	7.5kW
		HDv-E630-4T011B-000	11kW
		HDv-E630-4T015B-000	15kW
		HDv-E630-4T018B-000	18.5kW
		HDv-E630-4T022B-000	22kW
		HDv-E630-4T030B-000	30kW
		HDv-E630-4T037B-000	37kW
		HDv-E630-4T045B-000	45kW
		HDv-E630-4T055B-000	55kW
		HDv-E630-4T075B-000	75kW
		HDv-E630-4T090B-000	90kW
		HDv-E630-4T110B-000	110kW
		HDv-E630-4T132B-000*2	132kW
		HDv-E630-4T160B-000*2	160kW
		HDv-E630-4T200B-000*2	200kW
		HDv-E630-4T220B-000*2	220kW
		HDv-E630-4T250B-000*2	250kW
		HDv-E630-4T280B-000*2	280kW
		HDv-E630-4T315B-000*2	315kW
		HDv-E630-4T355B-000*2	355kW
		HDv-E630-4T400B-000*2	400kW
		HDv-E630-4T450B-000*2	450kW

Note: 1. The product is not yet released, please stay informed.

Target reader

HCFA E630-Series VFD users can refer to this manual for wiring, installation, diagnosis, and maintenance. Users require a basic level of electrical and automation knowledge.

Safety guidelines

◤ Safety icons

During product use, these safety rules must be strictly followed as specified in this manual.

DANGER ⚠	Improper operation may cause minor to moderate injuries, or major injuries/death in severe cases, and potential property damage.
WARNING ⚠	Improper operation may cause minor to moderate injuries or equipment damage.
CAUTION ⚠	Improper operation may cause minor injuries or equipment damage.
NOTE	Improper operation may damage the environment/equipment or cause data loss.

Note: Key points/explanations to aid better operation and product understanding.

◤ Safety rules

DANGER ⚠

Before installation

- Water ingress or stains on the machine during unpacking indicate prior dampness or submersion. Do not install.
- Damaged or missing components found during unpacking. Do not install.
- A mismatch between packaging labels and actual contents. Do not install.
- Carry the machine gently during transportation; otherwise, damage may occur.
- Avoid touching internal components with bare hands; otherwise, electrostatic damage may occur.

During installation

- Install on flame-retardant materials (e.g., metal) and keep away from flammable objects; otherwise, fire hazards may occur.
- Tighten mounting bolts as specified; otherwise, machine drop may occur.
- Do not arbitrarily adjust fixed bolts, especially those marked in red.

During wiring

- It is mandatory to follow this manual's guidelines and perform the work with qualified electrical engineers; failure to do so may lead to hazards.
- A circuit breaker matching the drive's capacity must isolate the VFD from the power supply; otherwise, fire hazards may arise.
- Verify power disconnection at the wiring section before proceeding; strictly prohibit live working, as failure to comply may result in electric shock. Ensure proper grounding of the drive as per standards, as failure to comply may result in electric shock.
- Do not connect input power to the drive's U\V\W output terminals. Confirm terminal markings during wiring to prevent mis-connection; otherwise, damage may occur.
- Ensure main-circuit cable cross-sections and wiring meet standards (EMC/local safety); otherwise, latent accident risks or actual occurrences may persist.
- Do not connect braking resistors to the drive's DC bus (+, -) terminals; otherwise, fire hazards may occur.
- Configure control wiring for the drive as per standards: use shielded cables for analog and high-speed pulse I/O lines, with single-end grounding.

Before powering on

- Recheck that peripheral devices and cables are configured with recommended models as per this manual, and all wiring follows specified connection methods; otherwise, accidents or equipment damage may occur.
- Reconfirm the drive's voltage rating matches the power supply; mismatch may trigger accidents or equipment damage.

After powering on

- Do not open the cover of the VFD; otherwise, electric shock may occur.
- Do not touch or operate the VFD with wet hands; otherwise, electric shock may occur.
- Do not touch any input/output terminals of the VFD or pull/tug the connected wires and cables at any time; otherwise, electric shock or equipment damage may occur.
- Do not attempt to access or modify manufacturer parameters; otherwise, the VFD may become inoperable or even be damaged.
- Before conducting a load test run of the VFD, ensure the mechanical equipment is in a ready-to-start state and relevant personnel are within the safe area of the facility; otherwise, equipment damage or personal injury may occur.
- If motor parameter identification is required, be cautious of potential hazards or injuries to equipment and personnel that may arise when the motor is rotating.

During operation

- Do not touch components such as heat sink fans or braking resistors; otherwise, personal injury may occur.
- Detecting signals while the VFD is operating by non-professionals is strictly prohibited; otherwise, damage to the VFD or personal injury may occur.
- After the VFD is powered off, residual power remains inside. Do not perform disassembly or assembly operations within 10 minutes of power disconnection; otherwise, electric shock or equipment damage may occur.

During maintenance

- Do not perform any form of maintenance or repair on the VFD with power on; otherwise, electric shock may occur.
- Do not disassemble the interior of the VFD when all indicator lights on the panel and inside are still on; otherwise, electric shock may occur.
- Maintenance or upkeep of the VFD by non-professionals or untrained personnel is strictly prohibited; otherwise, the VFD may be damaged or personal injury may occur.
- Do not install or disassemble the standard or optional accessories of the VFD with power on; otherwise, electric shock or equipment damage may occur.

CAUTION ⚠

Do not disassemble or modify the equipment; otherwise, malfunctions, misoperations, or fires may occur. For equipment maintenance, please consult Zhejiang Hechuan Technology Co., Ltd.

Before installation

- Do not allow wire ends, conductive debris, or other foreign objects to fall into the machine; otherwise, damage to the machine may occur.
- Install the machine in a location with low vibration, free from water splashes, and protected from direct sunlight.
- When two or more machines are installed in the same cabinet, pay attention to their installation positions and ensure proper ventilation between the cabinet and the external environment to facilitate normal heat dissipation of the machines.

During operation

- During operation, avoid moving the VFD, the VFD mounting cabinet, or allowing foreign objects to fall into the VFD; otherwise, damage to the VFD may occur.
- Start or stop the VFD using terminal functions or other control loop methods. Avoid using the VFD's power-on operation mode to initiate start/stop, and strictly prohibit using contactor switching at the VFD output terminal to control motor start/stop.

DISPOSAL PRECAUTIONS ⚠

• When disposing of the product, handle it as industrial waste. For battery disposal, please dispose of it separately in accordance with the laws and regulations designated by each region.

CAUTION ⚠

• Since the equipment is precision equipment, avoid subjecting it to impacts exceeding the general specification values specified in this manual during transportation. Otherwise, it may likely become a cause of equipment malfunction. After transportation, please confirm the operation of the equipment.

Chapter 1 Product Overview

1.1 Model name denotation

HDv - E630 - 4T 037 B S - ***

Product name	
HDv	HCFA VFD

Product series	
E630	E630 series

Product voltage class	
2S	Single-Phase 220V~240V
4T	Three-Phase 380V~480V

Power class	
0.7	750W
1.5	1.5kW
2.2	2.2kW
3.7	3.7kW
5.5	5.5kW
7.5	7.5kW
011	11kW
015	15kW
018	18.5kW
022	22kW
037	37kW
...	
400	400kW

Software/Firmware customized code	
X	0-9/A-Z/N/A

Functional component*	
N/A	Without STO function
S	With STO function

*Note: Only available for E610 models.

Braking component	
N/A	Without braking component
B	With braking component

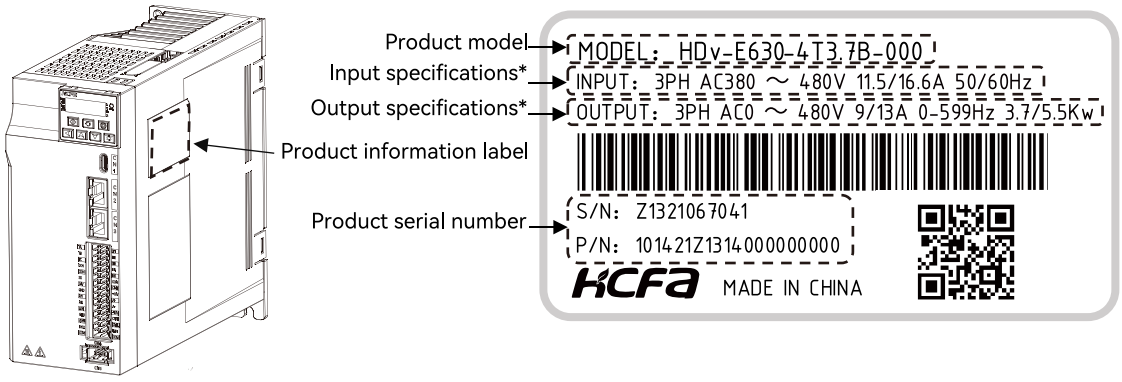


Figure 1. Model and label specifications

Item	Description
Product information label	Describe basic product information including model, and power
Product model	Display the product model
Input specifications*	Display the product input specifications INPUT: Rated input power supply voltage and input current
Output specifications*	Display the product output specifications OUTPUT: Rated output voltage, current, output frequency, and VFD power
Product serial number	Display the product serial number P/N, S/N: Product serial number

Note: Factory default is model G; Users can switch power segments and select the model via parameter settings. For parameter configuration, contact HCFA technicians.

Model P: Light-duty fan/pump load model;

Model G: Heavy-duty constant torque load model.

1.2 Description of each part of E630 series

1.2.1 Front view interface

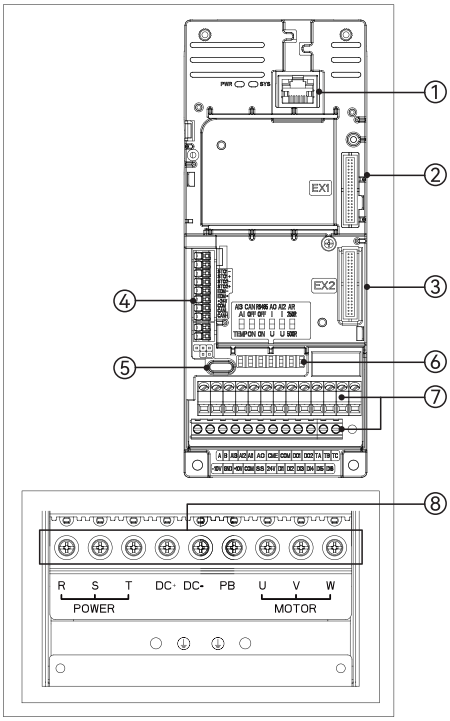


Figure 2. Front view interface diagram

Table 1. Front view interface description

No.	Name	Function
1	RJ45 interface	External keypad interface
2	EX1	Function expansion card interface
3	EX2	Encoder PG card interface
4	STO/CAN	Safe Torque Off (STO)/CAN interface
5	USB interface	USB interface for program burning
6	Function DIP switch	DIP switch for configuring different functions (refer to Note 1 for details)
7	Function I/O interface	Digital/Analog I/O, relay, common terminal, and other multi-function interfaces (refer to Section 7: Function I/O interface description for details)
8	Main circuit interface	Power supply input, motor power output interface

Table 2. STO/CAN interface description

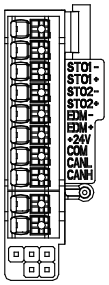
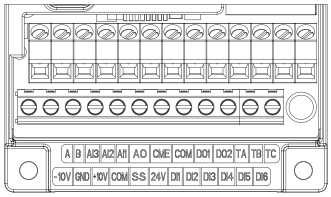
STO/CAN interface description		
	Pin	Description
	STO1-	Power module base blocking signal 1
	STO1+	
	STO2-	Power module base blocking signal 2
	STO2+	
	EDM-	Built-in safety circuit status monitoring (fixed output)
	EDM+	
	+24V	DC24V power supply (for STO use only)
	COM	
	CANL	Internal CAN protocol communication
	CANH	

Table 3. DIP switch function description

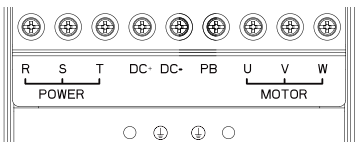
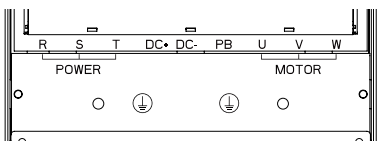
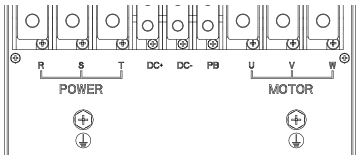
Silk Screen marking	AI3	CAN	RS485	AO	AI2	AR
Up	AI (Analog voltage input)	OFF (Termination resistor disconnected)	OFF (Termination resistor disconnected)	I (Output current signal)	I (Input current signal)	250R (AI2 input resistance)
Down	TEMP (Temperature input)	ON (Termination resistor connected)	ON (Termination resistor connected)	U (Output voltage signal)	U (Input voltage signal)	500R (AI2 input resistance)

Table 4. Function I/O interface description

Function I/O interface description												
A	B	AI3	AI2	AI1	AO	CME	COM	DO1	DO2	TA	TB	TC
												
-10V	GND	+10V	COM	SS	24V	DI1	DI2	DI3	DI4	DI5	DI6	-

Type	Pin	Description	Type	Pin	Description
Power supply	+10V / GND	+10V power supply	Digital output	DO1 / CME	Digital output 1
	-10V / GND	-10V power supply		DO2 / CME	Digital output 2
	24V / COM	Internal DC24V power supply	Relay output	TA / TB	Relay normally closed (NC) output
	SS	Digital input common terminal (factory default: short-circuited with 24V)		TA / TC	Relay normally open (NO) output
	CME	Digital output common terminal	Analog output	AO / GND	Analog output
Analog input (AI)	AI1 / GND	Analog input (AI) 1	RS485 communication interface	A	RS485 communication signal A
	AI2 / GND	Analog input (AI) 2		B	RS485 communication signal B
	AI3 / GND	Analog input (AI) 3			
Digital input	DI1 / SS	Digital input 1			
	DI2 / SS	Digital input 2			
	DI3 / SS	Digital input 3			
	DI4 / SS	Digital input 4			
	DI5 / SS	Digital input 5			
	DI6 / SS	Digital input 6			

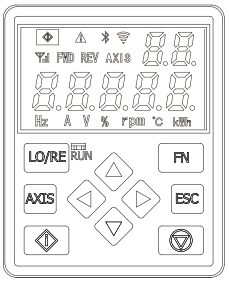
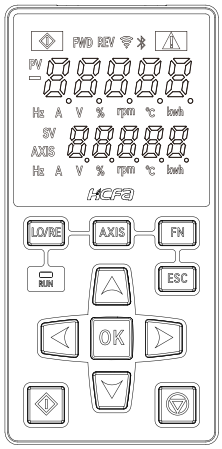
Table 5. Main circuit interface description

Main circuit interface description		
11~30kW	37~45kW	55~110kW
		

Pin	R	S	T	DC+	DC-	PB	U	V	W	⏚
Description	Three-phase main power supply input			Positive busbar voltage / Brake resistor interface	Negative busbar voltage	Brake resistor interface	Motor power output interface			Motor grounding terminal

1.2.2 Indicator & key description

Table 6. Indicator description

	Silk screen marking	Name	Color	Status	Description
	RUN	Power supply indicator	Red	Not lit	Busbar power loss
				Lit	Busbar power on
	⚠	Fault indicator	Red	Not lit	VFD no fault
				Lit	VFD fault
	◈	Operation indicator	Green	Not lit	VFD not running normally
				Lit	VFD running
	ᛒ	Bluetooth indicator*	Green	Not lit	Bluetooth not connected
				Lit	Bluetooth connected
	ᯤ	Wireless connection indicator*	Green	Not lit	Wireless not connected
				Lit	Wireless connected
	REV	Reverse rotation indicator	Green	Not lit	From reverse rotation to forward rotation
				Lit	During the operation state with reverse rotation command before stop, the VFD runs in reverse.
	FWD	Forward rotation indicator	Green	Not lit	From forward rotation to reverse rotation
				Lit	During the operation state with forward rotation command before stop, the VFD runs forward.
	A	Current indicator	Green	Not lit	-
				Lit	Current unit: Current
	V	Voltage indicator	Green	Not lit	-
				Lit	Current unit: Voltage
	Hz	Frequency indicator	Green	Not lit	-
				Lit	Current unit: Frequency
	%	Percentage indicator	Green	Not lit	-
				Lit	Current unit: Percentage
	℃	Celsius indicator	Green	Not lit	-
				Lit	Current unit: Celsius
	kWh	Power indicator	Green	Not lit	-
				Lit	Current unit: kW/h
	rpm	Speed indicator	Green	Not lit	-
				Lit	Current unit: Revolutions per minute (rpm)

*Note: The product is not yet released, please stay informed.

Table 7. Key description

Key	Name	Description	Key	Name	Description
	RUN	Controls the motor operation in the panel control mode.		Left shift	Switches displayed parameters in Level 0 menu; cyclically displays panel parameters by moving left in Level 2 and Level 3 menus.
	Control command source switching	Switches between the operation panel and remote control.		UP	Increases displayed parameters.
	RESET/STOP	Resets faults during fault alarms; stops motor operation during running state.		Down	Decreases displayed parameters.
	Parameter setting/ Confirmation	Confirms and enters the next-level menu.		Right shift	Switches displayed parameters in Level 0 menu; cyclically displays panel parameters by moving right in Level 2 and Level 3 menus.
	FN	Function is defined by parameter P10.02.		ESC	Enters Level 0 menu or returns to the previous level menu.
	AXIS	Reserved key.			

1.3 Product dimensions

I. Power: 11~15kW

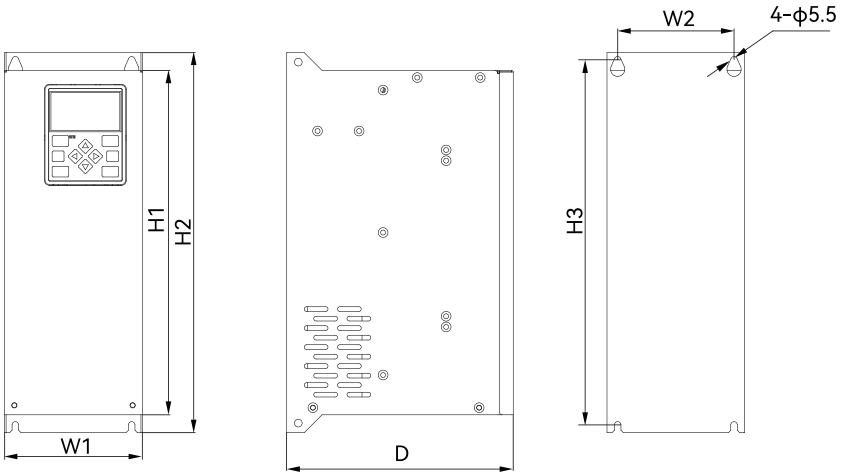


Figure 3. Dimensional drawing of E630 series products (11~15kW)

Dimension: mm					
W1	W2	H1	H2	H3	D
116	98	290	320	307.5	191

II. Power: 18.5~30kW

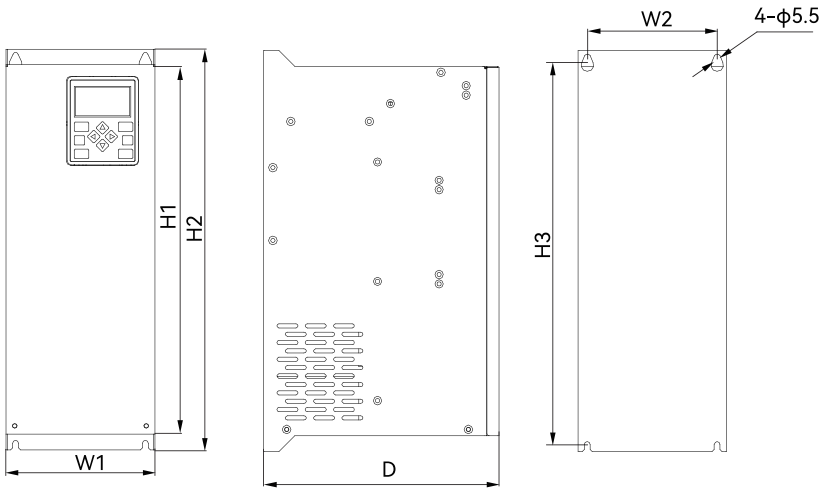


Figure 4. Dimensional drawing of E630 series products (18.5~30kW)

Dimension: mm					
W1	W2	H1	H2	H3	D
142	124	353	383	370.5	225

III. Power: 37~45kW

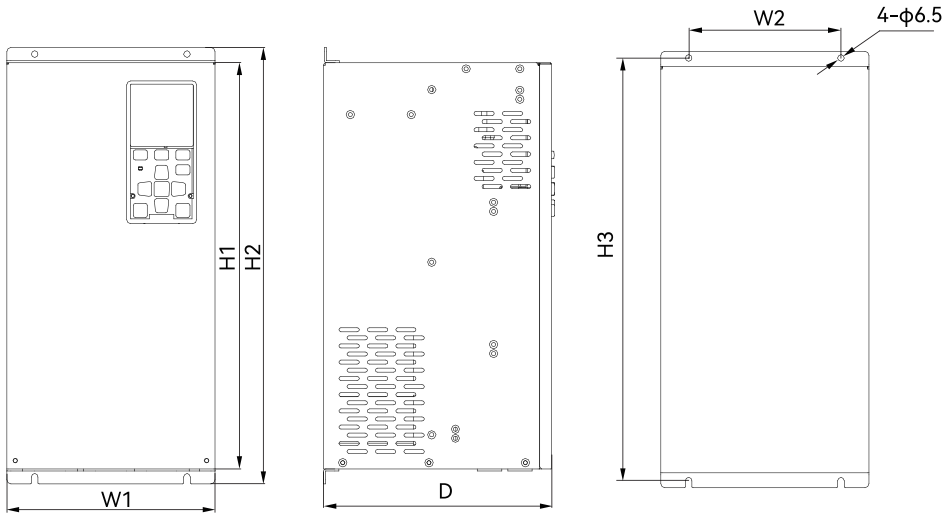


Figure 5. Dimensional drawing of E630 series products (37~45kW)

Dimension: mm					
W1	W2	H1	H2	H3	D
205	150	400	430	416.5	224.5

IV. Power: 55~75kW

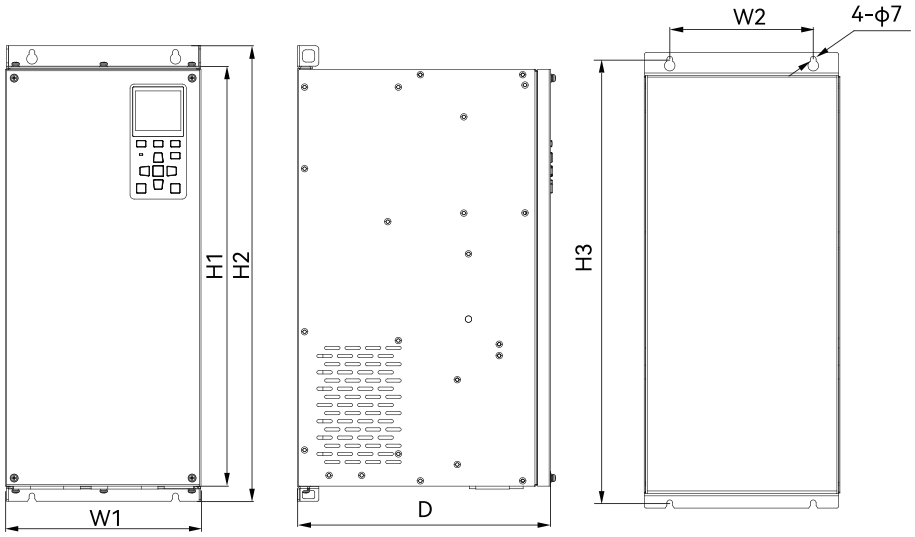


Figure 6. Dimensional drawing of E630 series products (55~75kW)

Dimension: mm					
W1	W2	H1	H2	H3	D
240	176	511	558.5	544	310

V. Power: 90~110kW

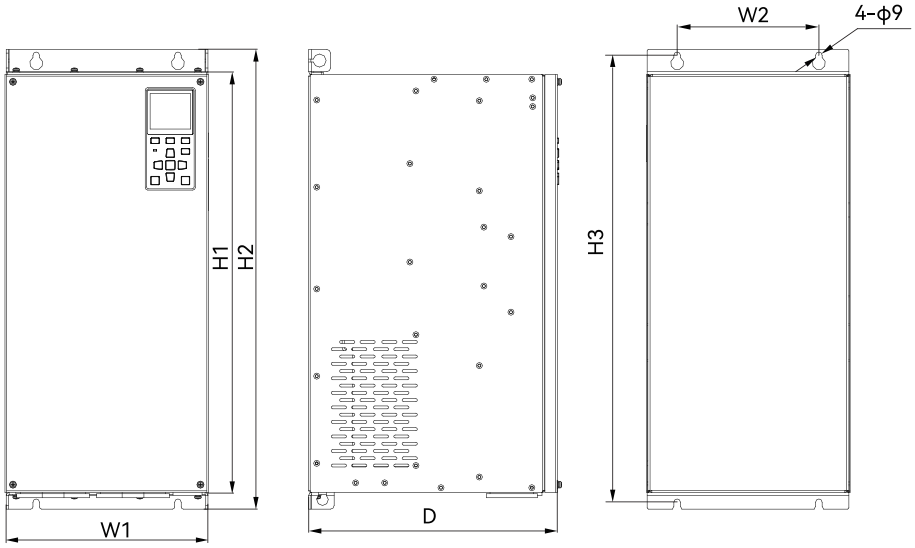


Figure 7. Dimensional drawing of E630 series products (90~110kW)

Dimension: mm					
W1	W2	H1	H2	H3	D
280	195	575	632.5	615	342

Chapter 2 Parameter Specifications

2.1 General specifications

Item		Specifications
Operating environment	Operating temperature	-10℃ ~50℃ (For temperatures ranging from 40 to 50° C, a 2% derating per degree Celsius is required.)
	Storage temperature	-40℃ ~70℃
	Operating humidity	20% ~ 95%RH (non-condensing)
	Altitude	≤ 1000m (For altitudes ranging from 1000 to 3000 meters, a 2% derating is required for every 100 meters.)
	Vibration resistance	< 5.9m/s^2 (0.6g)
	Shock resistance	Acceleration of 100m/s2 or less (XYZ)
	Protection rating	IP20
	Pollution degree	Pollution degree II
EMC	Electrostatic discharge	Air discharge: ±8kV Contact discharge: ±4kV
	Electrical fast transient/ burst	±2kV
	Surge	AC power DM (differential mode) 1kV CM (common mode) 2kV
Heat dissipation		Forced air cooling
Installation position		Screw fixing
Main material		Sheet metal

2.2 Basic specifications

2.2.1 Input voltage three-phase 380V standard model

Product model	Power supply capacity	Input current	Output current	Compatible motor	VFD cooling air flow
	KVA	A	A	kW	cfm
Single-phase power supply: 200V AC ~ 240V AC（-15% ~ +10%）; 50/60Hz ±5%（47Hz ~ 63Hz）					
HDv-E630-2S0.4*	1.4	5.4	2.3	0.4	10
HDv-E630-2S0.7*	2.2	8.2	4	0.75	
HDv-E630-2S1.5*	3.7	14	7	1.5	
HDv-E630-2S2.2*	6.0	23	9.6	2.2	26
HDv-E630-2S4.0*	8.9	14.6	13	4.0	
Three-phase power supply: 380V AC ~ 480V AC（-15% ~ +10%）; 50/60Hz ±5%（47Hz ~ 63Hz）					
HDv-E630-4T0.7*	1.5	3.4	2.1	0.75	10
HDv-E630-4T1.5*	3.0	5.0	3.8	1.5	
HDv-E630-4T2.2*	4.0	5.8	5.1	2.2	
HDv-E630-4T3.7*	5.9	10.5	9.0	3.7	26
HDv-E630-4T5.5*	8.9	14.6	13	5.5	
HDv-E630-4T7.5*	11	20.5	17	7.5	
HDv-E630-4T011	17	26	25	11	52
HDv-E630-4T015	21	35	32	15	

HDv-E630-4T018	24	38.5	37	18.5	130
HDv-E630-4T022	30	46.5	45	22	
HDv-E630-4T030	40	62	60	30	
HDv-E630-4T037	57	76	75	37	157
HDv-E630-4T045	69	92	91	45	
HDv-E630-4T055	85	113	112	55	200
HDv-E630-4T075	114	157	150	75	
HDv-E630-4T090	134	180	176	90	360
HDv-E630-4T110	160	214	210	110	
HDv-E630-4T132	192	256	253	132	630
HDv-E630-4T160	231	307	304	160	

***Note: Product development is in progress.**

E630 series VFD power (kW)			0.75	1.5	2.2	3.7	5.5	7.5
Instantaneous maximum output current [Arms]			3.8	6.9	9.2	16.2	23.4	30.6
Rated output voltage [V]			0~input voltage					
Maximum output frequency [Hz]			0 ~ 599					
Carrier frequency [Hz]			VF: 0.5k~16k; SVC: 0.5k~10k					
Overload capability			110% rated current for 1 hour, 150% rated current for 1 minute, and 180% rated current for 1 second					
Input power supply voltage [V]			Three-phase AC 380 V ~ 480V, 50/60Hz (-15% ~ 10%)					
Wide voltage [V]			Wide voltage range: 187~242V (-15%~10%)					
Braking resistor	External braking resistor	Resistance value [Ω]	300	220	200	130	90	65
		Capacity [W]	150	150	250	300	400	500
	Minimum resistance value of external braking resistor [Ω]		96	96	64	32	32	32

E630 series VFD power (kW)			11	15	18.5	22	30	37
Instantaneous maximum output current [Arms]			40	57.6	66.6	81	108	135
Rated output voltage [V]			0~input voltage					
Maximum output frequency [Hz]			0 ~ 599					
Carrier frequency [Hz]			VF: 0.5k~16k; SVC: 0.5k~10k					
Overload capability			110% rated current for 1 hour, 150% rated current for 1 minute, and 180% rated current for 1 second					
Input power supply voltage [V]			Three-phase AC 380 V ~ 480V, 50/60Hz (-15% ~ 10%)					
Wide voltage [V]			Wide voltage range: 187~242V (-15%~10%)					
Braking resistor	External braking resistor	Resistance value [Ω]	43	32	25	22	16	16
		Capacity [W]	800	1000	1300	1500	2500	3700
	Minimum resistance value of external braking resistor [Ω]		24	24	24	24	19.2	14.8

E630 series VFD power (kW)			45	55	75	90	110
Instantaneous maximum output current [Arms]			164	202	270	317	378
Rated output voltage [V]			0~input voltage				
Maximum output frequency [Hz]			0 ~ 599				
Carrier frequency [Hz]			VF: 0.5k~16k; SVC: 0.5k~10k				
Overload capability			110% rated current for 1 hour, 150% rated current for 1 minute, and 180% rated current for 1 second				
Input power supply voltage [V]			Three-phase AC 380 V ~ 480V, 50/60Hz (-15% ~ 10%)				
Wide voltage [V]			Wide voltage range: 187~242V (-15%~10%)				
Braking resistor	External braking resistor	Resistance value [Ω]	16	8	8	8*2	8*2
		Capacity [W]	4500	5500	7500	4500*2	5500*2
	Minimum resistance value of external braking resistor [Ω]		12.8	9.6	6.8	11.4*2	7.7*2

2.3 Performance specifications

2.3.1 Basic functions

Item	Specifications
Input frequency resolution	Digital setting: 0.01Hz Analogy setting: Maximum frequency×0.01%
Motor type and control mode	Three-phase asynchronous motor: VF control, sensorless vector control (SVC), sensor vector control (FVC) Permanent magnet synchronous motor: sensorless vector control (SVC), sensor vector control (FVC)
Start-up torque	150% (SVC 0.5Hz); 180% (FVC 0Hz)
Speed range	1: 50 VF control 1: 100 sensorless vector control 1: 1000 sensor vector control
Speed control accuracy	±1.0% VF control ±0.5% sensorless vector control ±0.02% sensor vector control
Torque boost	Automatic torque boost Manual torque boost 0.1%~30.0%
V/F curve	Linear V/F, multi-point V/F, Nth power V/F, VF separation
Acceleration/Deceleration curve	Linear or S-curve acceleration/deceleration modes. Four acceleration/deceleration time settings, with a range of 0.0 to 6500.0 seconds.
Automatic voltage regulator (AVR)	Automatically maintains a constant output voltage when the grid voltage changes.
DC braking	DC braking frequency: 0.00Hz~the maximum frequency Braking time: 0.00s~30.00s Braking current value: 0.00%~100.00%
JOG control	JOG frequency range: 0.00Hz~the maximum frequency JOG acceleration and deceleration time: 0.00s~600.00s
Simple PLC, multi-segment speed operation	Realize the maximum 16 segments of speed operation via built-in PLC and control terminals.
Built-in PID	Built-in two sets of PID parameters for realizing a closed-loop process control system
LED display	LED keypad for parameter setting and status monitoring
Protection function	Overcurrent protection, overvoltage protection, undervoltage protection, overheating protection, overload protection, fast current limiting, and torque limiting

2.3.2 Customized functions

Item	Specifications
Customized key	Supports optional programmable keys, jog, positive/negative input switching, function code display switching, and start/stop command switching.
Communication bus	Supports RS-485, Profibus-DP, CANopen, Profinet*, EtherCAT, EtherNET/IP.
Virtual IO	Multiple sets of virtual DIOs (Digital Input/Output) enable simple logic control.
STO function*	Built-in STO (Safe Torque Off) safety torque disconnection function.
Timer control	Set time range: 0min~6500min.
Multi-motor switching	Four sets of motor parameters enable switching control of four motors.
Motor overheat protection	AI3 accepts input from motor temperature sensors (PT100, PT1000, KTY).
Multi-encoder support	Supports differential, open collector, UVW, resolver, sin/cos encoders, and Tamagawa absolute encoders.
Customized fault diagnosis	Users can customize analog or digital quantity faults based on requirements.
Powerful background software	Supports inverter parameter operation and virtual oscilloscope function. The virtual oscilloscope enables graphical monitoring of the inverter's internal status.
User Programmable*	An optional user-programmable card supports secondary development. The programming method is compatible with HCFA PLCs.
Parameter batch burning	Quick parameter burning is achievable by connecting to the background software.
Electricity measurement	Calculates power consumption per unit time.
Display mode switch	Display modes include quick menu mode and a mode different from factory settings, facilitating debugging.
Running command channels	Three input channels: operation panel input, control terminal input, and communication input.
Frequency source	Input types: digital input, analog voltage input, analog current input, pulse input, multi-step speed, PLC, PID, and communication input.
Wireless communications *	Optional WIFI, Bluetooth, and IoT modules.

***Note: This function is retained.**

2.3.3 Special functions

Item	Specifications
Speed tracking	Enhanced speed tracking function (IM/PM) supports starting under non-stationary conditions.
Field weakening performance	Optimized load capacity in the field weakening region and enhanced high-speed field weakening performance.
Active preheating	Active motor preheating function reduces lubricant viscosity at low temperatures and improves low-temperature starting reliability.
Overload derating	Overload derating protection function prevents fault stop and reduces stopping frequency.

2.4 Interface specifications

Item			Specifications
Communication function	RS485 CAN communication	Connection device	Connecting to external communication devices
		Communication	RS485 port, Modbus RTU CAN port, internal CAN protocol communication
		Address setting	Parameter setting
		Cable connection	Category 5e shielded twisted pair cable
	USB communication	Device connection	PC (host computer supported)
		Communication specification	Compliant with USB specifications
	EtherCAT	Device connection	EtherCAT expansion card
Operation and display function			Built-in digital tube for display and keypad keys, with CHARGE and POWER indicators
External keypad interface			External RJ45 interface keypad operator
DI/DO/AI/AO input and output terminals			DI/DO input/output voltage range: DC 0~24V AI/AO input/output range: DC ±10V/0~20mA, resolution 10 bits Accuracy: ±20mV (Typ.), maximum output current 10mA
Braking function			Braking unit: standard for ≤ 30kW, optional for 37kW
Protection function			Overcurrent, overvoltage, undervoltage, overload, overheating, and phase loss fault
Safety function	Input		STO1, STO2: Base blocking signals of the power module
	Output		EDM1: Built-in safety circuit status monitoring (fixed output)
Optional accessories			Function expansion cards and PG cards

***Note: The product is not yet released, please stay informed.**

Chapter 3 Installation Instructions

3.1 Installation instructions

3.1.1 Installation in a control cabinet

Please pay attention to the following key points when installing the equipment in the control cabinet:

(1) Ensure the installation direction is perpendicular to the wall. Cool the equipment via natural convection or a fan, and secure it to the control cabinet with screws.

(2) To ensure effective cooling via natural convection or a fan, refer to the following figures for installation. Maintain sufficient clearance around the equipment to prevent localized overheating of its environment.

(3) For side-by-side installation, leave a horizontal clearance of ≥ 50 mm on both sides (clearance is optional if installation space is limited).

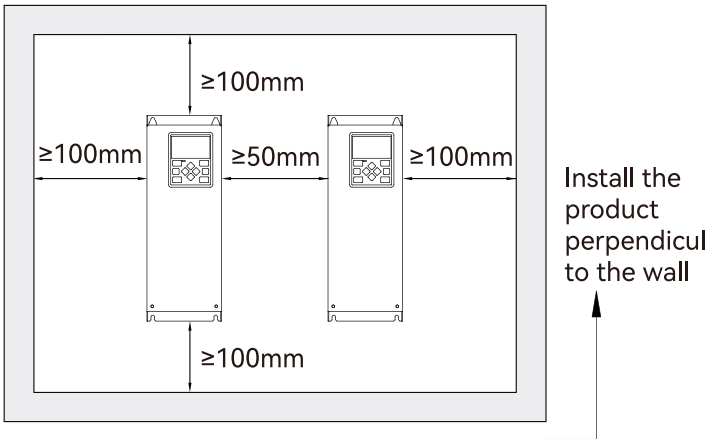


Figure 8. E630 control cabinet installation diagram

Note: 1. This diagram illustrates the external dimensions of the HDv-E630 (380V–11kW and 380V–15kW). For detailed appearance and installation instructions, refer to the sample manual.

2. It is recommended to secure the drive unit with M5×25 hexagon socket head cap screws, spring washers, flat washers, and M5 hexagon nuts. Tightening torque: 3.5 N·m.

3.1.2 VFD mounting and dismounting

I. VFD mounting

During mounting, secure the device with two M5×20 hex socket combination screws. First, pre-tighten screw ②, then slide the device's bottom base plate into screw ②, and subsequently tighten the upper housing with screw ①. The recommended torque is 3.5N·m.

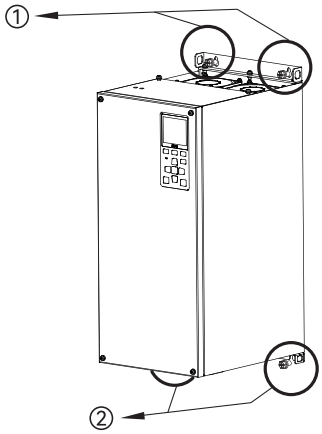
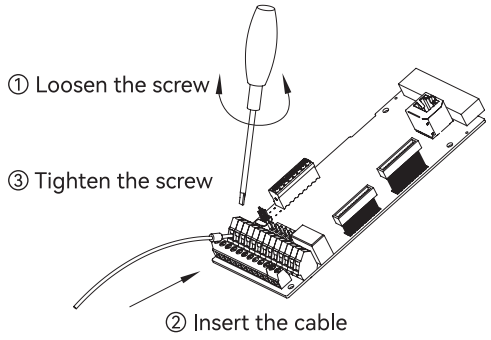
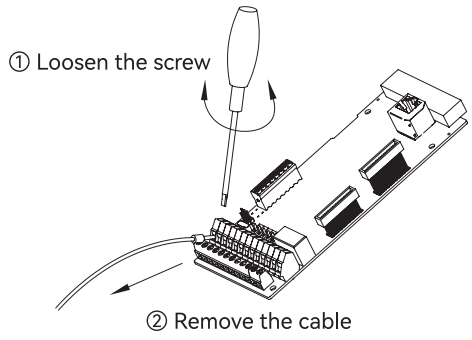


Figure 9. E630 series VFD mounting and dismounting

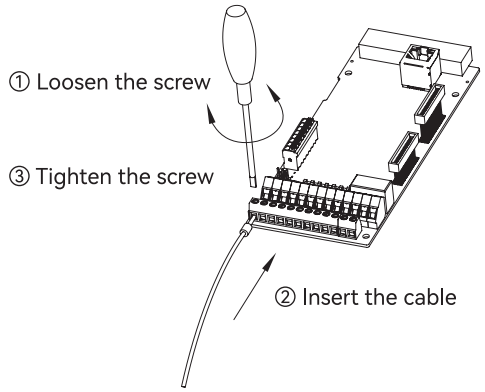
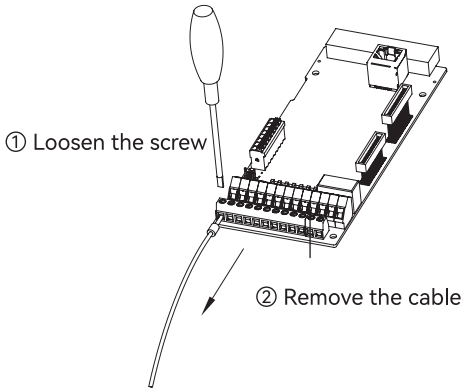
II. VFD dismounting

During dismounting, ensure the device is powered off first. Pre-loosen the screw ② with a screwdriver without fully removing it. Then, use the screwdriver to remove screw ① while supporting the device housing firmly with hands to prevent it from dropping. Once screw ① is completely detached, lift the device to complete the dismounting.

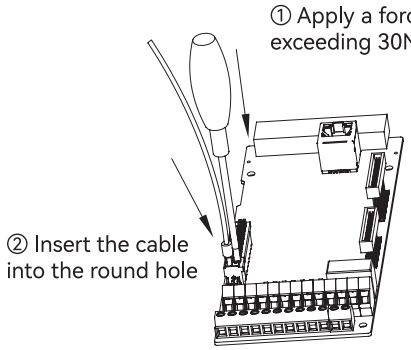
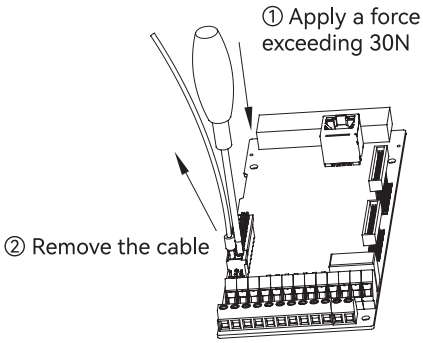
3.1.3 Functional I/O interface cable connection and disconnection 1

Cable connection	Cable disconnection
Use a screwdriver to loosen the corresponding interface screw or press down the corresponding unlocking tab. Then, insert the cable into the area below the screw or the terminal hole of the unlocking tab. Finally, tighten the screw or release the unlocking tab to complete the cable connection and disconnection.	Use a screwdriver to loosen the corresponding interface screw or press down the corresponding unlocking tab. Then, remove the cable from the terminal hole to complete the cable removal.
	

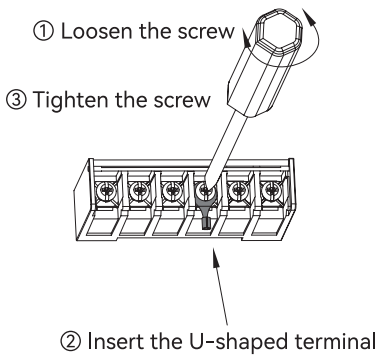
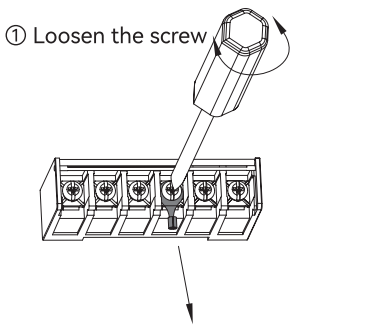
3.1.4 Functional I/O interface cable connection and disconnection 2

Cable connection	Cable disconnection
Use a screwdriver to loosen the corresponding interface screw or press down the corresponding unlocking tab. Then, insert the cable into the area below the screw or the terminal hole of the unlocking tab. Finally, tighten the screw or release the unlocking tab to complete the cable connection.	Use a screwdriver to loosen the corresponding interface screw or press down the corresponding unlocking tab. Then, remove the cable from the terminal hole to complete the cable disconnection.
	

3.1.5 Functional I/O interface cable connection and disconnection 3

Cable connection	Cable disconnection
Use a screwdriver to loosen the corresponding interface screw or press down the corresponding unlocking tab. Then, insert the cable into the round hole, and finally tighten the screw or release the unlocking tab to complete the cable connection.	Use a screwdriver to loosen the corresponding interface screw or press down the corresponding unlocking tab. Then, remove the cable from the terminal hole, and finally complete the cable disconnection.
	

3.1.6 Main circuit interface cable connection and disconnection 4

Cable connection	Cable disconnection
Ensure the device is powered off. Use a screwdriver to loosen the corresponding screw, insert the terminal block into the bottom of the screw washer, and finally tighten the screw to complete the cable connection.	Use a screwdriver to loosen the corresponding interface screw, then remove the cable from the terminal hole to complete the cable disconnection.
	

3.2 Wiring instructions

3.2.1 E630 wiring instructions

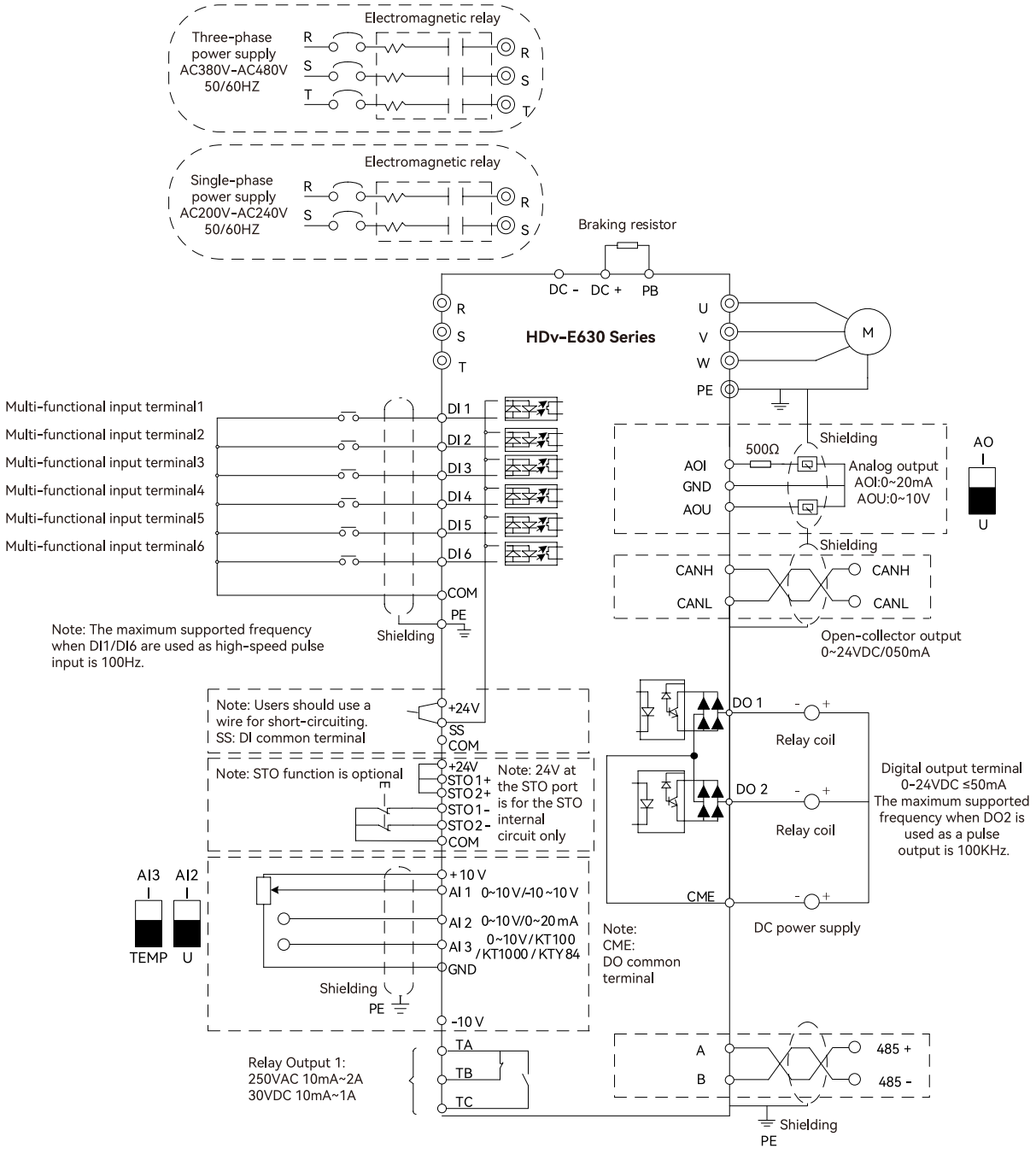


Figure 10. HDv-E630 series three-phase 380V model standard wiring diagram

Table 8. Main circuit interface description

Name	Description
R/S/T	Main circuit power input interface
DC+/PB	Regenerative braking resistor interface
DC+/DC-	Motor power output
U/V/W	DC bus terminal

Chapter 4 Parameter Description

Symbol description:

W--Indicates that the set value of the parameter can be modified during operation.

W*--Indicates that the set value of the parameter cannot be modified during operation.

R--Indicates that the value of the parameter is a status monitoring parameter or a reserved parameter, which cannot be modified by users.

4.1 P00 Basic parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.00	GP type display	1: G type (Constant torque load model) 2: P type (Fan and pump load models)	uint16	1	R	0x0000

This parameter is only intended for users to view the factory model and cannot be modified.

1: Applicable to constant torque loads with specified rated parameters.

2: Applicable to variable torque loads (fan and pump loads) with specified rated parameters.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.01	Motor control modes	0: Sensorless vector control (SVC) 1: Sensor vector control (FVC) 2: V/F control	uint16	2	W*	0x0001

0: Sensorless Vector Control (SVC)

Refers to open-loop vector control, suitable for general high-performance control applications. A single VFD can only drive one motor.

1: Sensor vector control (FVC)

Refers to closed-loop vector control, which requires an encoder and a PG card. It is suitable for scenarios requiring high-precision speed or torque control. A single VFD can only drive one motor, making it ideal for applications like high-speed paper machinery, cranes, and elevators.

2: V/F control

Suitable for applications with less demanding load requirements or where a single VFD drives multiple motors (e.g., fans, pumps). It can be used in scenarios where a single VFD drives multiple motors.

Note: When selecting the vector control mode, it is essential to perform motor parameter identification. Only with accurate motor parameters can the benefits of vector control mode be fully realized. To achieve optimal performance, adjust the speed loop parameters in the P02/P20 groups, which correspond to motor parameter groups 1 and 2, respectively.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.02	Command source selection	0: Operator panel control 1: External terminal control 2: Communication control	uint16	0	W	0x0002

Select the VFD control command channel.

VFD control commands include: start, stop, forward rotation, reverse rotation, jog, etc.

0: Operator panel control

Start/stop control is performed via the RUN and R/STOP buttons on the VFD operator panel.

1: External terminal control

Start/Stop control is performed via the multi-function input terminals DI1~DI5/HDI.

2: Communication control

Operation commands are sent by the upper computer via communication (supports Modbus-RTU/CANopen).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.03	Main frequency source X selection	0: Digital setting (P00.12 non-retentive during power loss) 1: Digital setting (P00.12 retentive during power loss) 2: AI1 3: AI2 5: PULSE setting (DI1/HDI) 6: Multi-segment command 7: Simple PLC 8: PID 9: Communication setpoint	uint16	0	W*	0x0003

Selection of the VFD main setpoint frequency input channel. There are 9 main setpoint frequency channels in total:

0: Digital setting (non-retentive during power loss)

Initial value: The value of P00.12 "Digital setting preset frequency."

The set frequency can be adjusted via the ▲ and ▼ keys on the keypad or the UP/DOWN functions of the multi-function input terminals.

"Non-retentive" means that when the VFD loses power, the set frequency will reset to the value of P00.12 "Digital setting preset frequency."

1: Digital setting (retentive during power loss)

Initial value: The value of P00.12 "Digital setting preset frequency."

The set frequency can be adjusted via the ▲ and ▼ keys on the keypad or the UP/DOWN functions of the multi-function input terminals.

"Retentive" means that when the VFD is powered on again after a power loss, the set frequency will remain as it was before the last power loss (note: requires coordination with P00.19).

2: AI1

3: AI2

Refers to frequency determination via analog input terminals. The standard unit provides 2 analog input terminals: AI1 supports 0V~10V voltage-type input; AI2 supports either 0V~10V voltage input or 4mA~20mA current input (selected via the J16 jumper on the control board, with factory default set to current-type for AI2).

5: Pulse setpoint (DI1/HDI)

Frequency setpoint is decided via pulse signals from the terminal.

Pulse setpoint signal specifications: voltage range 0V~24V, frequency range 0kHz~100kHz.

Note: Pulse setpoint can only be input from the multi-function input terminal DI1/HDI.

6: Multi-segment speed

Selects multi-segment speed operation mode. Parameters in the P05 group, "Input terminal parameter group," and the P11 group, "Multi-segment speed command parameter group," must be configured to define the correspondence between the input signal and the setpoint frequency.

7: Simple PLC

Selects simple PLC mode. When using the simple PLC as the frequency source, parameters in the P11 group "Multi-segment speed command parameter group" must be set to determine the setpoint frequency.

8: PID

Selects process PID control. In this mode, parameters in the P08 group "Process PID control parameter group" must be configured. The VFD's operating frequency will be the frequency value after PID regulation. For definitions of terms such as the PID setpoint source, the setpoint quantity, and the feedback source, refer to the description of P08 group "Process PID control parameter group."

9: Communication setpoint

Refers to the main frequency source being set by the upper computer via communication (supports Modbus-RTU/CANopen).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.04	Auxiliary frequency source Y selection	0: Digital setting (P00.12 non-retentive during power loss) 1: Digital setting (P00.12 retentive during power loss) 2: AI1 3: AI2 5: Pulse setting (DI1/HDI) 6: Multi-segment command 7: Simple PLC 8: PID 9: Communication setpoint	uint16	0	W*	0x0004

When the auxiliary frequency source Y is used as an independent frequency setpoint channel (i.e., when the frequency source is switched between X and Y), its usage is the same as the main frequency source X.

When the auxiliary frequency source Y is used as a superimposed setpoint (i.e., when the frequency source is selected as X+Y, switching between X and X+Y, or switching between Y and X+Y), the following special considerations apply:

1. When the auxiliary frequency source is a digital setpoint, the preset frequency (P00.12) does not take effect. The set frequency can be adjusted upwards or downwards based on the main setpoint frequency via the ▲ and ▼ keys on the keypad (or the UP/DOWN functions of the multi-function input terminals).

2. When the auxiliary frequency source is an analog input setpoint (AI1, AI2) or a pulse input setpoint, 100% of the input setting corresponds to the auxiliary frequency source range (see the description of P00.06 and P00.07). If it is necessary to adjust upwards or downwards based on the main setpoint frequency, set the corresponding setting range of the analog input to -n% ~ +n% (see the AI curve settings in Group P05).

3. When the frequency source is a pulse input setpoint, it behaves similarly to the analog input setpoint.

Note: The selection of the auxiliary frequency source Y and the setpoint of the main frequency source X cannot be the same, meaning the main and auxiliary frequency sources cannot share the same frequency setpoint channel.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.05	Frequency source superposition selection	Units digit: Frequency command selection 0: Main frequency source X 1: Main-auxiliary operation result (operation relationship determined by the tens digit) 2: Switch between main frequency source X and auxiliary frequency source Y 3: Switch between main frequency source X and main-auxiliary operation result 4: Switch between auxiliary frequency source Y and main-auxiliary operation result Tens digit: Main-auxiliary operation relationship for frequency command 0: Main + auxiliary 1: Main – auxiliary 2: Maximum of the two 3: Minimum of the two	uint16	00	W	0x0005

The frequency setpoint is achieved by combining the main frequency source X and the auxiliary frequency source Y.

Units digit: Frequency source selection

0: Main frequency source X

The main frequency X serves as the target frequency.

1: Main-Auxiliary operation result

The result of the main-auxiliary operation serves as the target frequency (the operation relationship is defined by the tens digit).

2: Switch between the main frequency source X and the auxiliary frequency source Y

When the "Frequency source switching" function of the multi-function input terminal 18 is invalid, the main frequency X is the target frequency.

When the "Frequency source switching" function of the multi-function input terminal 18 is valid, the auxiliary frequency Y is the target frequency.

3: Switch between the main frequency source X and the main-auxiliary operation result

When the "Frequency source switching" function of the multi-function input terminal 18 is invalid, the main frequency X is the target frequency.

When the "Frequency source switching" function of the multi-function input terminal 18 is valid, the main-auxiliary operation result is the target frequency.

4: Switch between auxiliary frequency source Y and main-auxiliary operation result

When the "Frequency source switching" function of the multi-function input terminal 18 is invalid, the auxiliary frequency Y is the target frequency.

When the "Frequency source switching" function of the multi-function input terminal 18 is valid, the main-auxiliary operation result is the target frequency.

Tens digit: Main-auxiliary operation relationship for frequency source

0: Main frequency source X + Auxiliary frequency source Y

The sum of the main frequency X and the auxiliary frequency Y serves as the target frequency, enabling frequency superposition setpoint.

1: Main frequency source X - Auxiliary frequency source Y

The difference between the main frequency X and the auxiliary frequency Y serves as the target frequency.

2: MAX (main frequency source X, auxiliary frequency source Y)

The target frequency is the value with the larger absolute value between the main frequency X and the auxiliary frequency Y.

3: MIN (main frequency source X, auxiliary frequency source Y)

The target frequency is the value with the smaller absolute value between the main frequency X and the auxiliary frequency Y.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.06	Relative value selection for auxiliary frequency source Y during superposition	0: Relative to maximum frequency 1: Relative to frequency source X	uint16	0	W	0x0006
P00.07	Range of auxiliary frequency source Y during superposition	0%~150%	uint16	100%	W	0x0007

When the frequency source is selected as a superposition setpoint (P00.05 set to 1, 3, or 4), this parameter determines the adjustment range of the auxiliary frequency source. P00.06 is used to define the reference object for this range. If it is set to "Relative to maximum frequency X," the range will vary with changes in the main frequency X.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.08	Maximum frequency	50.00Hz~599.00Hz	uint16	50.00Hz	W*	0x0008
P00.09	Upper frequency limit source	0: Set via P00.10 1: AI1 2: AI2 4: Pulse setting 5: Communication setpoint	uint16	0	W*	0x0009
P00.10	Upper frequency limit	Lower frequency limit (P00.11) ~ Maximum frequency (P00.08)	uint16	50.00Hz	W	0x000a

The maximum frequency is the upper limit of all frequency-related parameter settings in the VFD.

The upper frequency limit is the highest frequency output by VFD for the operation of users' equipment system.

This parameter defines the source of the upper frequency limit. The upper frequency limit can be derived from a digital setting (P00.10) or an analog input channel. When the upper frequency limit is set via an analog input, 100% of the analog input setting corresponds to the maximum frequency.

For example, during torque control (where speed control is disabled), to prevent overspeed (uncontrolled acceleration) caused by material breakage, the upper frequency limit can be set via an analog input. When the VFD operates at the upper frequency limit value, torque control becomes invalid, and the VFD continues to operate at the upper frequency limit.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.11	Lower frequency limit	0.00Hz ~ Upper frequency limit (P00.10)	uint16	0.00Hz	W	0x000b

The lower frequency limit is the minimum frequency output by the VFD for the operation of users' equipment system. When the set frequency is lower than the lower frequency limit, the VFD operates in the mode selected by P01.20. Among these, the maximum output frequency ≥ upper frequency limit ≥ lower frequency limit.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.12	Preset frequency	0.00Hz ~ Maximum frequency (P00.08)	uint16	50.00Hz	W	0x000c

When the frequency source is selected as "Digital setpoint," the value of this function code is the initial digital set frequency of the VFD.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.13	Acceleration time 1	0.0s~6500.0s	uint16	10.0s	W	0x000d
P00.14	Deceleration time 1	0.0s~6500.0s	uint16	10.0s	W	0x000e

Acceleration time refers to the time required for the VFD to accelerate from 0Hz to the acceleration/deceleration reference frequency (determined by P00.22), as shown by t1 in Figure 11.

Deceleration time refers to the time required for the VFD to decelerate from the acceleration/deceleration reference frequency (determined by P00.22) to 0Hz, as shown by t2 in Figure 11.

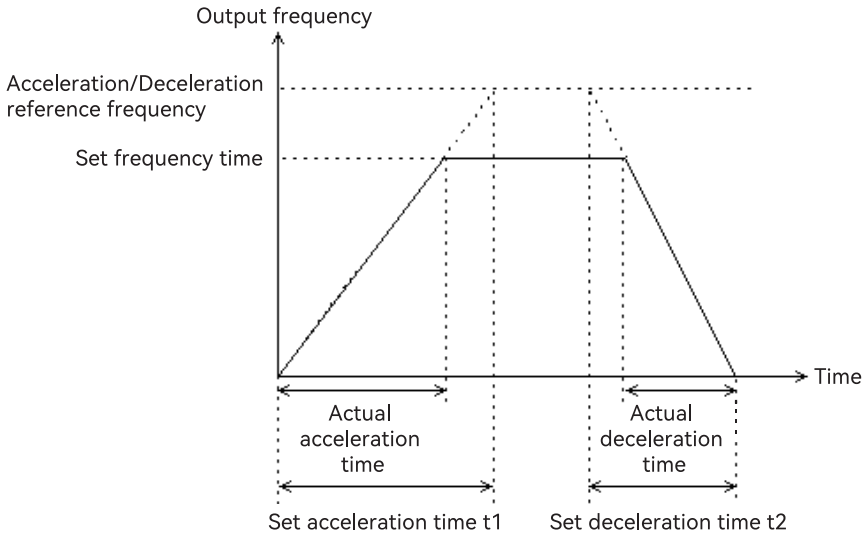


Figure 11. Acceleration/Deceleration time diagram

Note the difference between actual acceleration/deceleration time and set acceleration/deceleration time.

There are 4 groups of acceleration/deceleration time selections:

Group 1: P00.12, P00.13

Group 2: P01.41, P01.42

Group 3: P01.43, P01.44

Group 4: P01.45, P01.46

The acceleration/deceleration time can be selected via the multi-function digital input terminals (P05-00 ~ P05-06).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.15	Upper frequency limit offset	0.00Hz ~ Maximum frequency (P00.08)	uint16	0.00Hz	W	0x000f

Actual upper frequency limit = Upper frequency limit (P00.10) + Upper frequency limit offset (P00.15)

When the upper frequency limit is set via an analog input, this parameter acts as the analog offset. The offset frequency is added to the analog upper frequency limit setpoint to determine the final upper frequency limit setpoint.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.17	Auxiliary frequency source offset frequency during superposition	0.00Hz ~ Maximum frequency (P00.08)	uint16	0.00Hz	W	0x0011

When the frequency source is set to "Main-auxiliary operation," the offset frequency is summed with the main-auxiliary operation result to determine the target frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.18	Frequency command decimal point	1: 0.1Hz 2: 0.01Hz	uint16	2	W*	0x0012

This function defines the unit for all frequency-related parameters. Note that modifying this value will change the actual frequency (the decimal position shifts, the displayed digit count remains unchanged, but the actual value changes).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.19	Digital setting frequency stop retention selection	0: Non-retentive 1: Retentive	uint16	0	W	0x0013

This function is only valid when the frequency source is set to "Digital setting."

"Non-retentive": after the VFD stops, the digital set frequency resets to the value of P00.12 "Digital setting preset frequency."

"Retentive": After the VFD stops, the digital set frequency retains the value set before the last stop.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.20	Command source binding frequency source	Units digit: Bound frequency source for the operator panel command Tens digit: Bound frequency source for the terminal command Hundreds digit: Bound frequency source for the communication command 0: No binding 1: Digital setting (retentive during power loss) 2: AI1 3: AI2 5: PULSE setting 6: Multi-segment command 7: Simple PLC 8: PID 9: Communication setpoint	uint16	0	W	0x0014

This parameter defines binding combinations between the three operation command channels and eight frequency setpoint channels to facilitate synchronized switching.

The definitions of the above frequency setpoint channels are consistent with those in "Main frequency source X selection" (P00.03); refer to the P00.03 function code description for details.

Different operation command channels can be bound to the same frequency setpoint channel. If set to "No binding," the frequency source is determined by P00.03 ~ P00.05.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.21	Acceleration/ Deceleration time unit	0: 10 seconds 1: 1 second 2: 0.1 seconds	uint16	1	W*	0x0015

When modifying this parameter, the number of decimal places displayed for the 4 sets of acceleration/deceleration time will change, and the corresponding acceleration/deceleration time values will also change. Special attention should be given during the application process.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.22	Acceleration/ Deceleration time reference frequency	0: Maximum frequency 1: Set frequency 2: 100.00Hz	uint16	0	W*	0x0016

This parameter defines the frequency range corresponding to acceleration/deceleration time (see Figure 11. Acceleration/ Deceleration time diagram).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.23	Parameter initialization	0: No operation 1: Restore factory parameters (excluding motor parameters) 2: Clear log information 3: Restore factory parameters (including motor parameters) 4: Save all current user function codes 501: Restore saved user function codes	uint16	0	W*	0x0016

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.24	Output phase sequence selection	0: Standard 1: Reversed	uint16	0	W	0x0018

Changing this function code can alter the motor's rotation direction without modifying any other parameters, equivalent to reversing the connection of any two wires (U, V, W) of the motor.

Note: After parameter initialization, the motor's operating direction will revert to its original state. Use with caution in systems where motor direction must remain fixed after commissioning.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.25	Carrier frequency	1.3kHz~16.0kHz	uint16	Model setting	W	0x0019

This parameter adjusts the VFD's carrier frequency. Modulating the carrier frequency can reduce motor noise, avoid mechanical system resonance points, minimize circuit leakage current to ground, and decrease VFD-generated interference.

At low carrier frequencies: Higher-order harmonic components in the output current increase, leading to greater motor losses and higher motor temperature rise.

At high carrier frequencies: Motor losses and temperature rise decrease, but VFD losses and temperature rise increase, along with enhanced interference.

Impact of carrier frequency adjustment on performance:

Table 9. Carrier frequency adjustment relationships

Carrier frequency	Low → High
Motor electromagnetic noise	High → Low
Output current waveform	Poor quality → Good quality
Motor temperature rise	High → Low
VFD temperature rise	Low → High
VFD leakage current	Low → High
Radiated interference	Low → High

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.26	Carrier frequency adjustment with temperature	0: Automatic adjustment 1: No adjustment	uint16	1	W	0x001a

Carrier frequency adjustment with temperature

0: Automatic adjustment

1: No adjustment

If set to 0, the VFD automatically reduces the carrier frequency as internal temperature rises to prevent overheating. Set to 1 if PWM carrier frequency variation is not permitted.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.27	DPWM switching upper frequency	5.00Hz ~ Maximum frequency (P00.08)	uint16	15.00Hz	W	0x001b

The VFD employs two PWM modulation modes: CPWM (7-segment) and DPWM (5-segment).

When the operating frequency is greater than the switching frequency (P00.27), DPWM modulation is used; when the operating frequency is less than the switching frequency (P00.27), CPWM modulation is used.

DPWM modulation improves VFD efficiency, while CPWM reduces motor noise. Adjusting P00.27 to the maximum frequency (P00.08) can further minimize motor noise.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.28	UP/DOWN reference for operating frequency command	0: Operating frequency 1: Set frequency	uint16	0	W*	0x001c

0: Operating frequency

1: Set frequency

This parameter is only valid when the frequency source is set to "Digital setting." It determines whether the UP/DOWN adjustment of the set frequency is based on the current operating frequency or the current target frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.29	Modulation mode	0: Asynchronous modulation 1: Synchronous modulation	uint16	0	W	0x001d

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.30	Dead time compensation mode	0: No compensation 1: Compensation mode 1	uint16	1	W	0x001e

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.31	Random PWM	0: Random PWM disabled 1~10: PWM carrier frequency random depth	uint16	0	W	0x001f

To reduce high motor noise, set P00.31 to a non-zero value. Increasing the value can improve the noise reduction effect, but setting it too high may negatively impact motor control performance. During the debugging process, start with a value of 1, then gradually increase it by 1 based on the specific application conditions on site.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.32	Overmodulation coefficient	100%~110%	uint16	105%	W*	0x0020

Increasing the voltage overmodulation coefficient can enhance the voltage output capability, effectively improving the motor's load capacity in the weak magnetic region; additionally, it will increase the distortion of the output current.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.33	Tuning selection	00: No operation 01: Asynchronous motor static partial tuning 02: Asynchronous motor dynamic tuning 03: Asynchronous motor static complete tuning 11: Synchronous motor static tuning 12: Synchronous motor dynamic tuning	uint16	0	R	0x0021

00: No operation

01: Asynchronous motor static partial tuning

02: Asynchronous motor dynamic tuning

03: Asynchronous motor static complete tuning

11: Synchronous motor static tuning

12: Synchronous motor dynamic tuning

Note: Before tuning, ensure the correct motor type and rated parameters (P02.00 – P02.05) are set, and set parameter P00.02 to 0 (operator panel control).

0: No operation (tuning is disabled.)

1: Asynchronous motor static partial tuning. Applicable for scenarios where the motor and load cannot be easily separated for rotational tuning.

Action instructions: Set P00.33 to 01, press the parameter save key (ENTER), and when the panel displays "FUCN," press the RUN key. The VFD will start tuning. Tune partial motor parameters: P02.06 (asynchronous motor stator resistance), P02.07 (asynchronous motor rotor resistance), P02.08 (asynchronous motor leakage inductance reactance); other parameters use default values.

2: Asynchronous motor dynamic tuning

To ensure optimal dynamic control performance of the VFD, select asynchronous motor dynamic tuning. During dynamic tuning, the motor must be unloaded (no load).

After selecting dynamic tuning, the VFD first performs static tuning. Once static tuning is complete, the motor accelerates to 80% of its rated frequency using the acceleration time set in P00.13, maintains this speed for a period, then decelerates to zero speed using the deceleration time set in P00.14. Dynamic tuning concludes.

Action instructions: Set P00.33 to 02, press the parameter save key (ENTER), and when the panel displays "FUCN," press

the RUN key. The VFD will start tuning. Tune all motor parameters: P02.06 (asynchronous motor stator resistance), P02.07 (asynchronous motor rotor resistance), P02.08 (asynchronous motor leakage inductance reactance), P02.09 (asynchronous motor mutual inductance reactance), P02.10 (asynchronous motor no-load current).

11: Synchronous motor static tuning

Applicable for scenarios where the motor and load are difficult to separate.

Action Instructions: Set P00.33 to 11, press the parameter save key (ENTER), and when the panel displays "FUCN," press the RUN key. The VFD will start tuning. Tune partial motor parameters: P02.11 (motor stator resistance), P02.12 (synchronous machine D-axis inductance), P02.13 (synchronous machine Q-axis inductance); other parameters use default values.

12: Synchronous motor dynamic tuning

To ensure optimal dynamic control performance of the VFD, select synchronous motor dynamic tuning. During dynamic tuning, the motor must be unloaded (no load).

After selecting synchronous dynamic tuning, the VFD first performs static tuning. Once static tuning is complete, the motor accelerates to the preset frequency (P00.12, set to a non-zero value) using the acceleration time in P00.13, maintains this speed for a period, then decelerates to zero speed using the deceleration time in P00.14. Dynamic tuning concludes.

Action instructions: Set P00.33 to 12, press the parameter save key (ENTER), and when the panel displays "FUCN," press the RUN key. The VFD will start tuning.

Tuning operation instructions:

When P00.33 is set to 1, 2, 11, or 12 and the ENTER key is pressed, the panel displays "FUNE." Press the RUN key to begin parameter tuning, and the "TUNE" indicator will stop blinking. After tuning completes, the display returns to the stop interface. Tuning can be aborted by pressing the STOP key during the process. Once tuning is finished, the value of P00.33 automatically resets to 0. Tune all motor parameters: P02.11 (motor stator resistance), P02.12 (synchronous machine D-axis inductance), P02.13 (synchronous machine Q-axis inductance), P02.14 (synchronous machine counter-electromotive force (CEMF)).

4.2 P01 Start/Stop control parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P00.00	Starting mode	0: Direct start 1: Speed tracking restart 2: Asynchronous motor pre-excitation start	uint16	0	W	0x0100

0: Direct start

If the starting DC braking time is set to 0, the VFD starts from the starting frequency. If the starting DC braking time is set to a non-zero value, the VFD first performs DC braking before starting. This mode is suitable for applications where small inertia loads may reverse during startup.

1: Speed tracking restart

The VFD first detects the motor's speed and direction, then starts at a frequency corresponding to the detected motor speed, enabling smooth, impact-free startup for rotating motors. This mode is suitable for instant power failure restart of large inertia loads. To ensure optimal performance of speed tracking restart, accurate motor parameters must be set (refer to parameter group P02).

2: Asynchronous motor pre-excitation start

Pre-excitation current and time share function codes with DC braking current and time.

If the pre-excitation time is set to 0, the VFD starts from the starting frequency. If the pre-excitation time is set to a non-zero value, the VFD first performs pre-excitation before starting, improving dynamic response speed.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.01	Starting frequency	0.00Hz~10.00Hz	uint16	0.00Hz	W	0x0101
P01.02	Starting frequency holding time	0.0s~100.0s	uint16	0.0s	W*	0x0102

To ensure starting torque, set an appropriate starting frequency. Additionally, to allow the motor to establish magnetic flux during startup, the VFD will start accelerating only after maintaining the starting frequency for a specified duration.

The starting frequency value (P01.01) is not restricted by the lower limit frequency. If the frequency setpoint (frequency source) is less than the starting frequency, the VFD remains in standby mode with an output frequency of 0Hz. The starting frequency holding time does not take effect during forward/reverse rotation switching. The holding time is not included in the acceleration time but is included in the operation time of a simple PLC.

Example 1:

- P00.03 = 0 (frequency source: digital setpoint)
- P00.12 = 2.00Hz (digital set frequency: 2.00Hz)
- P01.01 = 5.00Hz (starting frequency: 5.00Hz)
- P01.02 = 2.0s (starting frequency holding time: 2.0s)

Example 2:

- P00.03 = 0 (frequency source: digital setpoint)
- P00.12 = 10.00Hz (digital set frequency: 10.00Hz)
- P01.01 = 5.00Hz (starting frequency: 5.00Hz)
- P01.02 = 2.0s (starting frequency holding time: 2.0s)

In this case, the VFD accelerates to 5Hz, maintains this frequency for 2 seconds, and then continues accelerating to the set frequency of 10Hz.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.03	Starting DC braking / Pre-excitation current	0%~100%	uint16	50%	W*	0x0103
P01.04	Starting DC braking / Pre-excitation time	0.0s~100.0s	uint16	0.0s	W*	0x0104

Starting DC braking is generally used to stop the motor completely before restarting.

Pre-excitation is generally used to establish a magnetic field in the motor before starting, improving response speed.

If the starting mode is direct start, the VFD first performs DC braking with the set starting DC braking current when starting, and begins operation after the set starting DC braking time elapses. If the DC braking time is set to 0, the VFD starts directly without DC braking. The larger the DC braking current, the greater the braking force.

If the starting mode is asynchronous motor pre-excitation start, the VFD first pre-establishes a magnetic field with the set starting pre-excitation current when starting, and begins operation after the set starting pre-excitation time elapses. If the pre-excitation time is set to 0, the VFD starts directly without pre-excitation.

The starting DC braking/pre-excitation current refers to the percentage relative to the VFD's rated current.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.05	Stopping mode	0: Deceleration stop 1: Coast stop	uint16	0	W	0x0105

0: Deceleration stop

After the stop command is activated, the VFD reduces the output frequency according to the deceleration method and the defined acceleration/deceleration time, and stops when the frequency drops to 0.

1: Coast stop

After the stop command is activated, the VFD immediately terminates the output. The load stops freely according to mechanical inertia.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.06	Stopping DC braking start frequency	0.00hz ~ Maximum frequency P00.08	uint16	0.00Hz	W	0x0106
P01.07	Stopping DC braking waiting time	0.0s~100.0s	uint16	0.0s	W	0x0107
P01.08	Stopping DC braking current	0%~100%	uint16	50%	W	0x0108
P01.09	Stopping DC braking time	0.0s~100.0s	uint16	0.0s	W	0x0109

Stopping DC braking start frequency: During deceleration stopping, when this frequency is reached, the stopping DC braking process begins.

Stopping DC braking waiting time: Before stopping DC braking begins, the VFD stops output, and after this delay, DC braking starts. It is used to prevent overcurrent faults caused by starting DC braking at high speeds.

Stopping DC braking current: Refers to the applied DC braking amount. The larger this value, the stronger the DC braking effect.

Stopping DC braking time: The time during which the DC braking amount is applied. If this value is 0, it indicates no DC braking process, and the VFD stops according to the set deceleration stopping process.

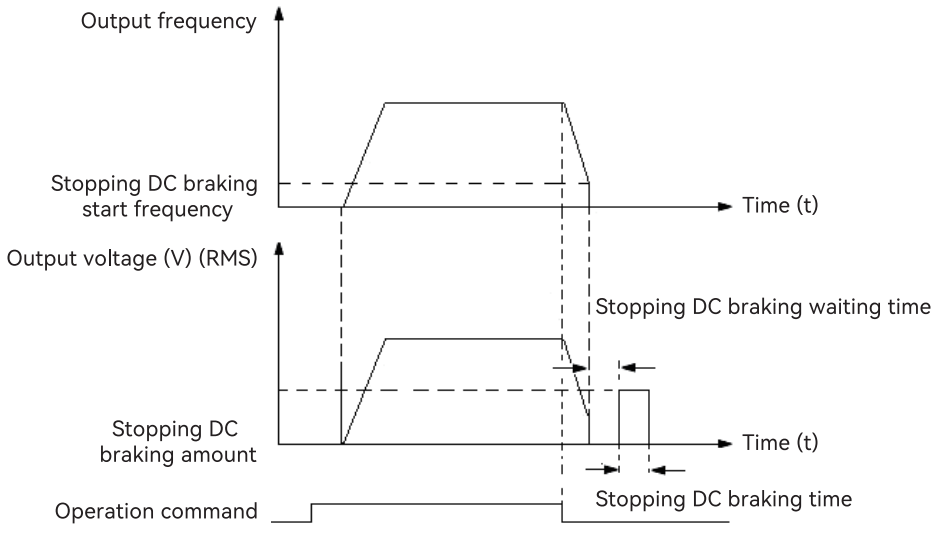


Figure 12. DC braking diagram

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.10	Jog operating frequency	0.00hz ~ Maximum frequency p00.08	uint16	2.00Hz	W	0x010a
P01.11	Jog acceleration time	0.0s~6500.0s	uint16	20.0s	W	0x010b
P01.12	Jog deceleration time	0.0s~6500.0s	uint16	20.0s	W	0x010c

Defines the frequency setpoint and acceleration/deceleration time of the VFD during jog.

The jog acceleration time refers to the time required for the VFD to accelerate from 0.00Hz to the maximum output frequency (P00.08).

The jog deceleration time refers to the time required for the VFD to decelerate from the maximum output frequency (P00.08) to 0.00Hz.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.14	Acceleration/ Deceleration mode	0: Linear acceleration/deceleration 1: S-Curve acceleration/deceleration A 2: S-Curve acceleration/deceleration B	uint16	0	W*	0x010e

Select the frequency change mode of the VFD during starting and stopping.

0: Linear acceleration/deceleration

The output frequency increases or decreases linearly. The acceleration/deceleration time changes according to the set acceleration/deceleration time. The E630 series VFD provides 4 types of acceleration/deceleration times. The acceleration/deceleration time can be selected via the multifunctional digital input terminals (P05.00 ~ P05.05).

1: S-Curve acceleration/deceleration A

The output frequency increases or decreases along an S-curve. S-curves are generally used in applications requiring smooth starting and stopping, such as elevators and conveyor belts. Function codes P01.15 and P01.16 respectively define the time ratio of the start and end segments of S-curve acceleration/deceleration A.

2: S-Curve acceleration/deceleration B

In this acceleration/deceleration curve, the motor rated frequency f_b is always the inflection point of the S-curve. It is generally used in high-speed areas above the rated frequency where short-term acceleration/deceleration is required.

When the set frequency is above the rated frequency, the acceleration/deceleration time is:

$$t = (\frac{4}{9} \times (\frac{f}{f_b})^2 + \frac{5}{9}) \times T$$

Where, f is the set frequency, f_b is the motor rated frequency, and T is the time to accelerate from 0.00Hz to the rated frequency f_b.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.15	S-Curve start segment time ratio	0%~100%	uint16	30%	W*	0x010f
P01.16	S-Curve end segment time ratio	0%~100%	uint16	30%	W*	0x0110

Function codes P01.15 and P01.16 respectively define the time ratio of the start and end segments of S-curve acceleration/deceleration A, and they satisfy: P01.15 + P01.16 ≤ 100%.

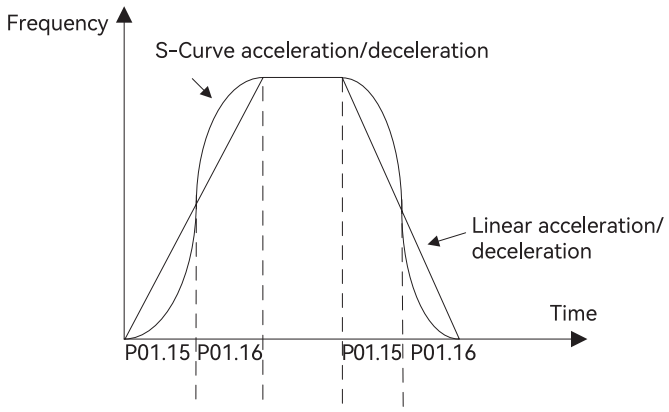


Figure 13. S-Curve acceleration/deceleration

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.17	Jump frequency 1	0.00Hz ~ Maximum frequency P00.08	uint16	0.00Hz	W	0x0111
P01.18	Jump frequency amplitude	0.00Hz ~ Maximum frequency P00.08	uint16	0.00Hz	W	0x0112

When the set frequency is within the jump frequency range, the actual operating frequency will be at the jump frequency boundary closest to the set frequency. By setting jump frequencies, the VFD avoids the mechanical resonance points of the load. This VFD allows setting two jump frequency points. If both jump frequencies are set to 0, this function will not take effect.

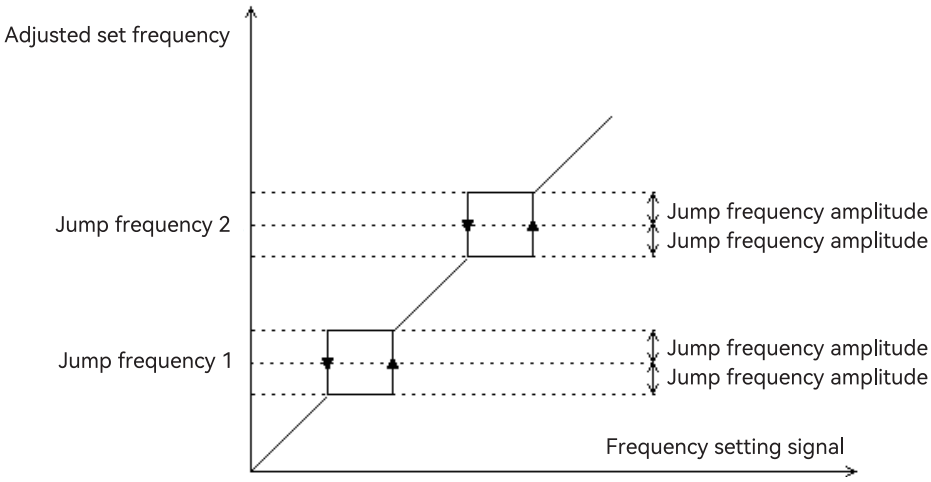


Figure 14. Jump frequency diagram

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.19	Forward/Reverse dead time	0s~3000.0s	uint16	0.0s	W	0x0113

Set the transition time of the VFD during forward/reverse transition at zero frequency output, as shown in the figure below:

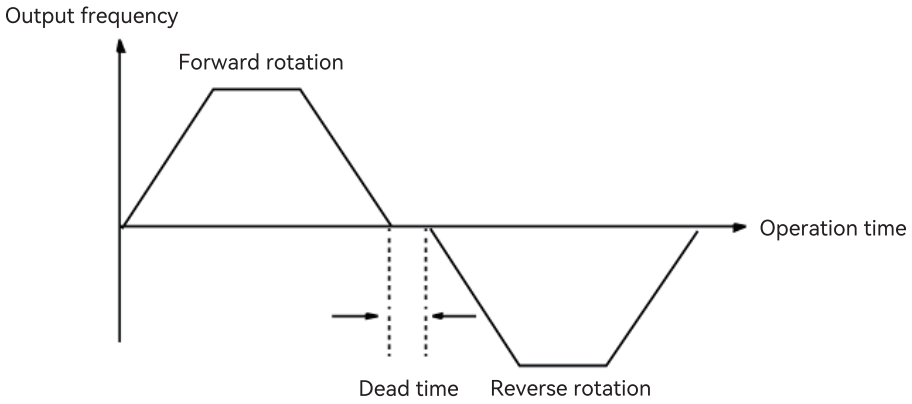


Figure 15. Dead time diagram

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.20	Operation at frequency below lower limit	0: Operate at the lower limit frequency 1: Deceleration stop 2: Zero speed operation	uint16	0	W	0x0114

Select the operating state of the VFD when the set frequency is below the lower limit. This function can be used to select stopping to avoid the motor running at low speed for extended periods.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.21	Reverse rotation control	0: Allow reverse rotation 1: Inhibit reverse rotation	uint16	0	W	0x0115

0: The reverse control can be performed via the keypad, terminals, or communication.

1: The reverse control function is active regardless of the command source selection; that is, reverse control is inactive for all keypad, terminal, and communication controls.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.22	Speed tracking mode	0: Start from stop frequency 1: Start from zero speed 2: Start from the maximum frequency	uint16	0	W	0x0116

To complete the speed tracking process in the shortest time, select the VFD's method of tracking the motor speed:

0: Track downward from the frequency at power outage; this method is commonly used.

1: Track upward from 0 Hz; this method is used when restarting after a long power outage.

2: Track downward from the aximum frequency; this method is generally used for generating loads.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.23	Speed tracking speed	1~100	uint16	20	W	0x0117

When using speed tracking restart mode, select the speed of speed tracking. A larger parameter value indicates faster tracking, but excessively large values may cause unreliable tracking.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.24	Braking usage rate	0%~100%	uint16	100%	W	0x0118

P01.25	Braking resistor activation time	0.0s~6500.0s	uint16	0.0s	W	0x0119

Effective for VFDs with built-in braking units. Adjust the braking effect of the braking unit.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.26	Demagnetization time	0.0s~500.0s	uint16	0.0s	W	0x011A

Changing P01.26 can adjust the speed of weak magnetic current adjustment, but faster adjustment may cause instability. Manual modification is generally not required.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.28	Terminal jog priority	0: Jog not allowed during operation 1: Jog allowed during operation	uint16	0	W	0x011c

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.34	Instantaneous power failure non-stop function selection	0: Inactive 1: Decelerate 2: Deceleration stop	uint16	0	W	0x0122

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.35	Instantaneous power failure action pause judgment voltage	80%~100%	uint16	85%	W	0x0123
P01.36	Instantaneous power failure non-stop voltage recovery judgment time	0.0s~100.0s	uint16	0.5s	W	0x0124
P01.37	Instantaneous power failure non-stop action judgment voltage	60%~100%	uint16	80%	W	0x0125
P01.38	Instantaneous power failure non-stop gain	0~100	uint16	40	W	0x0126
P01.39	Instantaneous power failure non-stop integral coefficient	0~100	uint16	30	W	0x0127
P01.40	Instantaneous power failure non-stop action deceleration time	0.0s~300.0s	uint16	10.0s	W	0x0128

This function refers to the VFD not stopping during instantaneous power failures. In the event of an instantaneous power failure or sudden voltage drop, the VFD reduces the output speed, uses energy fed back from the load to compensate for the voltage drop, and maintains operation for a short period.

If the instantaneous power failure non-stop function selection is active, when the bus voltage is lower than the voltage specified by the instantaneous power failure non-stop action judgment voltage (P01.37), the VFD decelerates according to the instantaneous power failure action selection. When the bus voltage recovers above the voltage specified by the instantaneous power failure action pause judgment voltage (P01.35) and remains at that level for the duration specified by the instantaneous power failure non-stop voltage recovery judgment time (P01.36), the VFD resumes operation at the set frequency; otherwise, the VFD will continue to reduce the operating frequency until it stops at 0.00Hz.

The instantaneous power failure non-stop function is shown in the figure below.

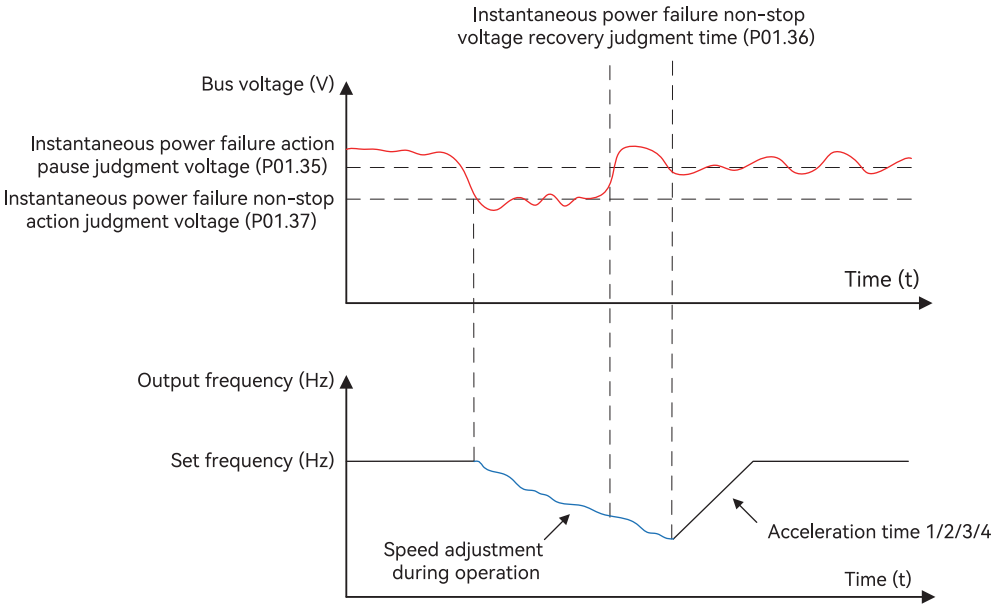


Figure 16. Instantaneous power failure non-stop action diagram

If the instantaneous power failure deceleration time is too long, the load feedback energy is small, and effective compensation for low voltage cannot be achieved; if the deceleration time is too short, the load feedback energy is large, which may trigger overvoltage protection. Please appropriately adjust the deceleration time based on the load inertia and load weight conditions.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.41	Acceleration time 2	0s~6500s	uint16	10s	W	0x0129
P01.42	Deceleration time 2	0s~6500s	uint16	10s	W	0x012a
P01.43	Acceleration time 3	0s~6500s	uint16	10s	W	0x012b
P01.44	Deceleration time 3	0s~6500s	uint16	10s	W	0x012c
P01.45	Acceleration time 4	0s~6500s	uint16	10s	W	0x012d
P01.46	Deceleration time 4	0s~6500s	uint16	10s	W	0x012e

Acceleration/deceleration time can be selected from P00.13, P00.14, and the above three acceleration/deceleration times. Their meanings are the same; refer to the relevant instructions for P00.13 and P00.14. The acceleration/deceleration times 1-4 during VFD operation can be selected by combining different multifunctional digital input terminals (DI). Refer to function codes P05.00-P05.04.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.49	Jump frequency 2	0Hz ~ Maximum frequency P00.08	uint16	0Hz	W	0x0131

When the set frequency is within the jump frequency range, the actual operating frequency will run at the jump frequency boundary closest to the set frequency. By setting jump frequencies, the VFD avoids the mechanical resonance points of the load. This VFD allows setting two jump frequency points. If both jump frequencies are set to 0, this function will not take effect.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.50	Startup protection selection	0: Valid 1: Invalid	uint16	0Hz	W	0x0131

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.51	Jump frequency validity during acceleration/ deceleration	0: Valid 1: Invalid	uint16	0	W	0x0133

When this function code is set to valid, if the operating frequency is within the jump frequency range, the actual operating frequency will directly skip the set jump frequency boundary.

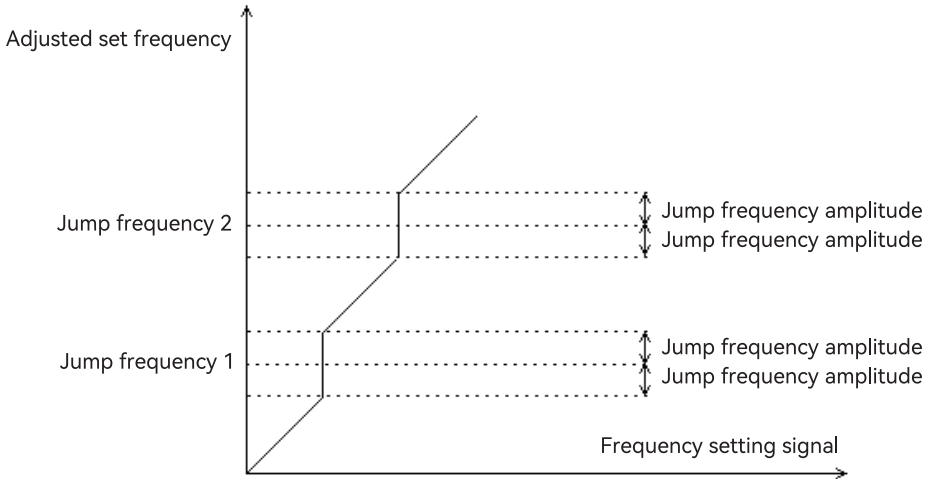


Figure 17. Jump frequency diagram

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P01.52	Jog frequency command source	0: Digital setting (P01.10) 1: AI1 2: AI2 3: Reserved 4: Pulse setting 5: Communication setpoint	uint16	0	W	0x0134

4.3 P02 Motor parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P02.00	Motor type selection	0: Asynchronous motor 1: Reserved 2: Permanent magnet synchronous motor	uint16	0	W*	0x0200

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P02.01	Motor rated power	0.1kw~1000kw	uint16	Model setting	W*	0x0201
P02.02	Motor rated voltage	1v~2000v	uint16	Model setting	W*	0x0202
P02.03	Motor rated current	0.01A~655.35A	uint16	Model setting	W*	0x0203
P02.04	Motor rated frequency	1hz ~ Maximum frequency P00.08	uint16	Model setting	W*	0x0204

P02.05	Motor rated speed	1rpm~65535rpm	uint16	Model setting	W*	0x0205

Note: Please set according to the motor nameplate parameters. The excellent control performance of vector control requires accurate motor parameters.

The VFD provides a parameter self-learning function.

Accurate parameter self-learning relies on the correct setting of motor nameplate parameters.

To ensure control performance, configure the motor according to the VFD's standard-matched motor. If the motor power deviates significantly from the standard-matched motor, the VFD's control performance will degrade noticeably.

Resetting the motor rated power (P02.01) will automatically update the set values of motor parameters P02.02 to P02.10.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P02.06	Asynchronous motor stator resistance	0.001Ω~65.535Ω	uint16	Model setting	W*	0x0206
P02.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω	uint16	Model setting	W*	0x0207
P02.08	Asynchronous motor leakage reactance	0.01mH~655.35mH	uint16	Model setting	W*	0x0208
P02.09	Asynchronous motor mutual reactance	0.01mH~655.35mH	uint16	Model setting	W*	0x0209
P02.10	Asynchronous motor no-load current	0.1mH~6553.5mH	uint16	Model setting	W*	0x020A
P02.11	Synchronous motor stator resistance	0.001Ω~65.535Ω	uint16	Model setting	W*	0x020B
P02.12	Synchronous motor D-axis inductance	0.01mH~655.35mH	uint16	Model setting	W*	0x020C
P02.13	Synchronous motor Q-axis inductance	0.01mH~655.35mH	uint16	Model setting	W*	0x020D
P02.14	Synchronous motor counter-electromotive force (CEMF)	0v~6553.5v	uint16	Model setting	W*	0x020E

After the normal completion of motor parameter self-learning, the set values of P02.06 to P02.14 will be automatically updated. These parameters are the reference parameters for high-performance vector control and have a direct impact on control performance.

Note: Users should not arbitrarily modify these parameters.

4.4 P03 Motor vector parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.01	Speed loop proportional gain 1	1~100	uint16	Model setting	W	0x0301
P03.02	Speed loop integral time 1	0.01s~10.00s	uint16	Model setting	W	0x0302
P03.03	Speed loop switching frequency 1	0hz ~ Speed loop switching frequency 2 P03.0	uint16	5.00Hz	W	0x0303

P03.04	Speed loop proportional gain 2	1~100	uint16	Model setting	W	0x0304
P03.05	Speed loop integral time 2	0.01s~10.00s	uint16	Model setting	W	0x0305
P03.06	Speed loop switching frequency 2	Speed loop switching frequency 1 P03.03 ~ Maximum frequency P00.08	uint16	10.00Hz	W	0x0306

The above parameters are only valid for vector control and invalid for V/F control. Below switching frequency 1 (P03.03), the speed loop PI parameters are: P03.01 and P03.02. Above switching frequency 2 (P03.05), the speed loop PI parameters are: P03.04 and P03.05. Between the switching points, the PI parameters are obtained through linear interpolation of the two sets of parameters.

Two sets of parameters can be configured for the VFD's vector control speed loop PI parameters, applicable to low-frequency and high-frequency operation respectively. These two sets of parameters switch smoothly based on switching frequency 1 and switching frequency 2, as shown in the figure below:

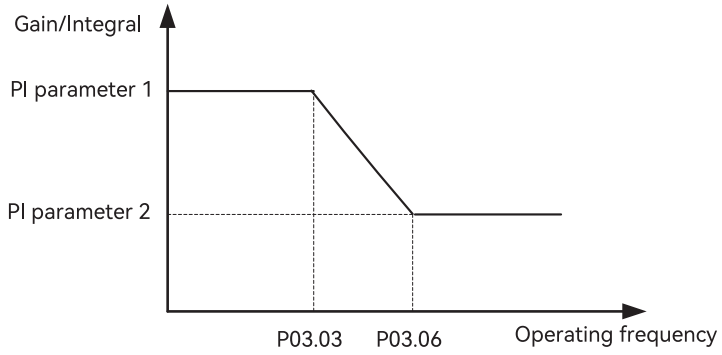


Figure 18. Speed loop parameter switching diagram

By setting the proportional coefficient and integral time of the speed regulator, the dynamic response characteristics of the vector control speed loop can be adjusted. Increasing the proportional gain or reducing the integral time can both accelerate the dynamic response of the speed loop. However, an excessively large proportional gain or excessively small integral time may easily cause system oscillation and excessive overshoot. An excessively small proportional gain may also lead to steady-state oscillation and potential speed steady-state error. The speed loop PI parameters are closely related to the inertia of the motor system. Users need to adjust the parameters based on the default PI values according to different load characteristics to meet the requirements of various operating scenarios.

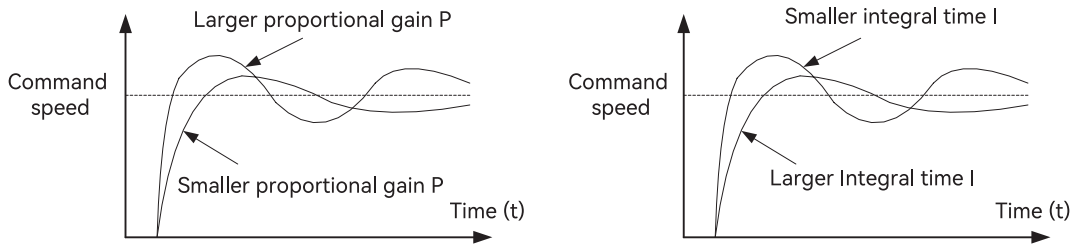


Figure 19. Speed loop parameter effect diagram

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.07	Speed loop filter time constant	0~0.031	uint16	0.028	W	0x0307

Set the filter time of the speed loop regulator. Do not modify unless there are special requirements.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.08	Slip compensation coefficient	0~200	uint16	100	W	0x0308

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.09	Vector control field over-excitation gain	0~200	uint16	64	W	0x0309

In vector control mode, when the deceleration field over-excitation function is activated, the intensity of the over-excitation function. Trigger condition: When excessive deceleration generated energy occurs, activating over-excitation can consume part of the generated energy. The larger the over-excitation gain, the stronger the suppression effect.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.10	Speed loop integration property	0: Normal speed loop 1: Integral separation speed loop	uint16	0	W	0x030a

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.11	Speed control (drive) torque upper limit source	0: Digital setting (P03.12) 1: AI1 2: AI2 4: Pulse setting 5: Communication setpoint 6: MIN (AI1, AI2) 7: MAX (AI1, AI2)	uint16	0	W	0x030b

Under vector control speed control mode, when the motor drives a load, the electromagnetic torque output by the motor must be limited. This function code sets the method for specifying the torque limit value.

0: Set by P03.12

The torque is limited by the digital set value of P03.12.

1: AI1

2: AI2

The torque limit is specified via an analog input.

4: Pulse setting

The torque limit is specified via high-speed pulse input.

5: MODBUS communication setpoint

The torque limit is specified via communication setpoint.

6: MIN(AI1, AI2)

7: MAX(AI1, AI2)

The torque limit is set to the minimum or maximum input of AI1 and AI2, respectively.

Note: When options 1 to 7 above are set to 100.0%, they correspond to the value set by P03.12.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.12	Speed control (drive) torque upper limit digital setting	0%~200%	uint16	150%	W	0x030c

When P03.11 is set to 0, the torque limit under speed control is determined by P03.12. Additionally, P03.12 also serves as the set value corresponding to 100.0% input when P03.11 selects options 1-7.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.13	M-axis current loop proportional gain	0~60000	uint16	Model setting	W	0x030d
P03.14	M-axis current loop integral gain	0~60000	uint16	Model setting	W	0x030e
P03.15	T-axis current loop proportional gain	0~60000	uint16	Model setting	W	0x030f
P03.16	T-axis current loop integral gain	0~60000	uint16	Model setting	W	0x0310

The vector control current loop PI adjustment parameters are divided into two groups: excitation and torque. These parameters are automatically obtained after motor tuning and generally do not require modification. Increasing the current loop proportional gain or integral gain can accelerate the system's dynamic response; decreasing them can enhance system stability. Improper settings may cause system oscillation.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.17	Speed control (brake) torque upper limit source	0: Digital setting (P03.18) 1: AI1 2: AI2 4: Pulse setting 5: Communication setpoint 6: MIN (AI1, AI2) 7: MAX (AI1, AI2)	uint16	0	W	0x0311

Under vector control speed control mode, when the motor is in a generating state, the braking torque output by the motor must be limited. This function code sets the method for specifying the torque limit value.

0: Set by P03.12

The torque is limited by the digital set value of P03.12.

1: AI1

2: AI2

The torque limit is specified via an analog input.

4: Pulse setting

The torque limit is specified via high-speed pulse input.

5: MODBUS communication setpoint

The torque limit is specified via communication setpoint.

6: MIN(AI1, AI2)

7: MAX(AI1, AI2)

The torque limit is set to the minimum or maximum input of AI1 and AI2, respectively.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.18	Speed control (brake) torque upper limit digital setting	0%~200%	uint16	150%	W	0x0312

When P03.17 is set to 0, the torque limit under speed control is determined by P03.12. Additionally, P03.18 also serves as the set value corresponding to 100.0% input when P03.17 selects options 1-7.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.19	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder* 2: Resolver 3: Sine/Cosine encoder 4: Wire-Saving UVW encoder* 5: Absolute encoder	uint16	0	W*	0x0313

After installing the PG card, correctly set the F1-28 encoder type according to the actual application scenario. Incorrect configuration may cause abnormal operation of the VFD. The specific encoder type shall be determined based on the on-site equipment in use.

0: ABZ incremental encoder

1: Reserved

2: Resolver

3: Sine/Cosine encoder

4: Reserved

5: Absolute encoder

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.20	Absolute encoder resolution	0~2	uint16	0	W*	0x0314

0: 16-bit

1: 23-bit

2: 24-bit

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.21	Encoder installation position angle	0~359.9	uint16	0	W*	0x0315

Encoder installation deviation angular

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.22	Speed feedback PG wire break detection time	0~10	uint16	0	W*	0x0316

ABZ encoder wire break effective when non-zero

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.23	Z-signal correction enable	0~1	uint16	1	W	0x0317

0: Z-signal correction alarm disabled

1: Z-signal correction alarm enabled

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.24	Encoder pulse count	1~65535	uint16	1024	W*	0x0318

ABZ encoder line count

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.25	Encoder phase sequence/main direction	0: Forward 1: Reverse	uint16	0	W*	0x0319

Encoder installation direction

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.28	Resolver pole pairs	0~10	uint16	1	W*	0x031c

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.30	Overspeed detection value	0~50	uint16	20	W*	0x031e
P03.31	Overspeed detection time	0~60	uint16	1	W	0x031f

In overspeed protection, when the VFD detects that the motor's actual speed exceeds P00.08 (maximum frequency), and the percentage deviation is greater than P03.30 (overspeed detection value), and the duration exceeds P03.31 (overspeed detection time), the VFD will report a motor overspeed fault (E43.00) and perform a coast stop.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.32	Excessive speed deviation detection value	0~50	uint16	20	W	0x0320
P03.33	Excessive speed deviation detection time	0~60	uint16	5	W	0x0321

The overspeed deviation protection function is only effective when the VFD is operating in sensor vector control mode (P00.01=1).

In excessive speed deviation protection, when the VFD detects that the deviation between the motor's actual speed and the set frequency exceeds P03.32 (excessive speed deviation detection value) and the duration exceeds P03.33 (excessive speed deviation detection time), the VFD will report an excessive speed deviation fault (E42.00) and perform a coast stop. If P03.32 (excessive speed deviation detection time) is set to 0.0s, the excessive speed deviation fault detection is disabled.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.34	Drive torque upper limit source	0: Digital setting (P03.35) 1: AI1 2: AI2 4: Pulse setting 5: Communication setpoint 6: MIN(AI1, AI2) 7: MAX(AI1, AI2)	uint16	0	W*	0x0322

Select the torque setting command; refer to speed control mode.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.35	Digital setting for drive torque upper limit	-200%~200%	uint16	150%	W	0x0323

Digital set value in torque mode. Torque setting uses a relative value, where 100.0% corresponds to the motor rated torque. The setting range is -200% to 200%, indicating that the maximum torque of the VFD is 2 times the motor rated torque. When the torque set value is positive, the VFD operates forward; when negative, it operates in reverse.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.36	Maximum forward frequency in torque control	0.00Hz ~ Maximum frequency P00.08	uint16	50.00Hz	W	0x0324
P03.37	Maximum reverse frequency in torque control	0.00Hz ~ Maximum frequency P00.08	uint16	50.00Hz	W	0x0325

Under torque control mode, these are the maximum forward/reverse operating frequencies of the VFD. During torque control, if the load torque is less than the motor output torque, the motor speed will continuously increase. To prevent accidents such as overspeed, the maximum motor speed during torque control must be limited.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.38	Speed/Torque control mode	0: Speed control 1: Torque control	uint16	0	W*	0x0326

Select whether the VFD control mode is speed control or torque control. This function code needs to be determined in conjunction with terminal function 29 (torque control inhibition) and 46 (speed control/torque control switch).

When torque control prohibition is active, the VFD operates in speed control mode.

When torque control inhibition is inactive:

If speed control/torque control switch is inactive, the control mode is determined by P03.38. If speed control/torque control switch is active, the control mode is the inverse of P03.38.

In torque control mode, the VFD operating frequency is set by P03.36 and P03.37, and the acceleration/deceleration time is set by P03.39 and P03.40.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.39	During torque control acceleration	0s~650s	uint16	0s	W	0x0327
P03.40	During torque control deceleration	0s~650s	uint16	0s	W	0x0328

In torque control mode, the difference between the motor output torque and load torque determines the acceleration of the motor and load. Setting the acceleration/deceleration time controls the smooth variation of motor speed.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.41	Frequency limit source in torque control	0: Digital setting (P03.36~P03.37) 1: AI1 2: AI2 4: Pulse setting 5: Communication setpoint 6: MIN (AI1, AI2) 7: MAX (AI1, AI2)	uint16	0	W*	0x0329

Select the speed setting command in torque mode; refer to speed control mode.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.42	Speed loop mode selection	0~1	uint16	0	W	0x032a

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P03.46	Output power correction coefficient	0%~200%	uint16	100%	W	0x032e

When the output power (P03.46) does not correspond to the expected value, the output power can be linearly corrected using this value.

4.5 P04 Motor V/F parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.00	VF curve setting	0: Linear V/F curve 1: Multi-Point V/F curve 2: Square V/F curve 3: Reserved 4: Reserved 6: Reserved 8: Reserved 10: Fully-decoupled VF mode 11: Semi-decoupled VF mode	uint16	0	W*	0x0400

0: Linear V/F curve

Below the rated frequency, the VFD's output voltage varies linearly with the output frequency, making it suitable for general mechanical drive applications such as high-inertia fans, accelerating stamping presses, centrifuges, and water pumps.

1: Multi-Point V/F curve

Frequency point setting range: 0.00Hz ~ motor rated frequency; voltage point setting range: 0.0% ~ 100.0% (corresponding to 0V ~ motor rated voltage). The set values of the multi-point V/F curve are typically configured based on the motor's load characteristics. Ensure the following setting order: P04.02 ≤ P04.04 ≤ P04.06.

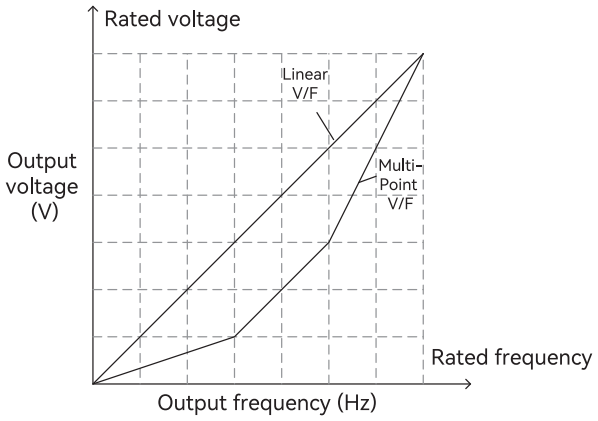


Figure 20. V/F curve diagram

10: Fully-decoupled VF mode

The VFD's output frequency and voltage are independent. The output frequency is determined by the frequency source,

while the output voltage is determined by the V/F decoupled voltage source. Generally used in applications such as torque motor control.

11: Semi-decoupled VF mode

In this mode, V and F are proportional, but the proportionality can be adjusted via the voltage source. The relationship between V and F is also related to the motor's rated voltage and frequency (first group parameters). Assuming the voltage source input is X (a value between 0-100%), the relationship between the VFD's output voltage and frequency F is: V/F = 2 × X × (motor rated voltage) / (motor rated frequency).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.02	Multi-Point VF frequency point 1	0.00Hz~P04.04	uint16	0.00Hz	W*	0x0402
P04.03	Multi-Point VF voltage point 1	0%~100%	uint16	0%	W*	0x0403
P04.04	Multi-Point VF frequency point 2	P04.02~P04.06	uint16	0.00Hz	W*	0x0404
P04.05	Multi-Point VF voltage point 2	0%~100%	uint16	0%	W*	0x0405
P04.06	Multi-Point VF frequency point 3	P04.06 ~ Motor rated frequency P02.04	uint16	0.00Hz	W*	0x0406
P04.07	Multi-Point VF frequency point 3	0%~100%	uint16	0%	W*	0x0407

Parameters P04.02 to P04.07 define the multi-point V/F curve. The frequency point setting range is 0.00Hz ~ motor rated frequency, and the voltage point setting range is 0.0% ~ 100% (corresponding to 0V ~ motor rated voltage). The set values are typically configured based on the motor's load characteristics. Frequency setting requirement: P04.02 ≤ P04.04 ≤ P04.06.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.08	VF over-excitation gain	0~200	uint16	64	W*	0x0408

A higher VF over-excitation gain enhances the suppression effect of over-voltage stall. When using a braking resistor, adding a braking unit, or employing an energy feedback unit, ensure the over-excitation gain is set to 0; otherwise, excessive operating current may occur.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.09	Torque boost cutoff frequency	0.00Hz ~ Maximum frequency P00.08	uint16	50.00Hz	W*	0x0409
P04.10	Torque boost	0%~30%	uint16	Model setting	W	0x040a

The torque boost function is generally applied under low-frequency conditions of the VFD. Under V/F control, the output torque of the VFD is proportional to the frequency. At low frequencies, the motor's torque at low speeds is relatively low. Increasing this parameter can raise the output voltage, increase the current, and thereby enhance the output torque. Note that this value should not be set too high, as it may cause excessive current and trigger overload protection.

Torque boost cutoff frequency: The torque boost function is disabled when the operating frequency reaches the torque boost cutoff frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.11	VF overcurrent stall trip current	50%~200%	uint16	150%	W*	0x040b

P04.12	VF overcurrent stall enable	0: Inactive 1: Active	uint16	1	W*	0x040c
P04.13	VF overcurrent stall suppression gain	0~100	uint16	20	W	0x040d
P04.14	VF double-speed over-current stall trip current compensation coefficient	50%~200%	uint16	50%	W*	0x040e

During VFD operation, if the current exceeds the over-current stall trip current (P04.11), overcurrent suppression will be triggered to reduce the output frequency. The frequency will only gradually increase and return to normal after the current drops below the overcurrent trip current. The over-current stall strategy increases the acceleration time. If the actual acceleration time is too long to meet requirements, the over-current stall trip current (P04.11) can be appropriately increased.

VF overcurrent stall trip current: When the motor current exceeds this value, the VFD enables the over-current stall function. The default value is 150%, i.e., 1.5 times the VFD's rated current.

VF overcurrent stall enable: 0: V/F over-current stall disabled; 1: V/F over-current stall enabled. Over-current stall is enabled by default.

VF overcurrent stall suppression gain: A higher set value results in greater changes in the output frequency during overcurrent and stronger overcurrent suppression.

VF double-speed over-current stall trip current compensation coefficient: Reduce the over-current stall trip current at high speeds. The compensation coefficient is ineffective at 50%; the action current in the flux-weakening region corresponds to the recommended set value of 100% for P04.11.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.16	V/F oscillation suppression enable	0: Inactive 1: Active	uint16	1	W*	0x0410
P04.17	Oscillation suppression gain	1~100	uint16	40	W	0x0411

Under V/F control, the motor is prone to speed and current oscillations due to load disturbances during operation. Severe oscillations may cause the system to fail to operate normally or even trigger overcurrent protection. Adjust P04.16 to enable or disable the V/F oscillation suppression function; adjust P04.17 to effectively suppress speed and current oscillations. Generally, no modification is required. If adjustment is necessary, make gradual changes around the factory default values and avoid setting excessively high values, as this may impair V/F control performance.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.20	V/F decoupled voltage source	0: Digital setting 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Multi-Segment command 6: Simple PLC 7: PID 8: Communication setpoint	uint16	0	W	0x0414
P04.21	V/F decoupled voltage source digital setting	0~2000V	uint16	0V	W	0x0415

V/F decoupled voltage source: The target voltage set channel under the condition of separated voltage and frequency.

0: Digital setting

The VFD's output voltage is set via digital setting, with the set value being the value of P04.21 (V/F decoupled voltage source digital setting).

1: AI1

The VFD's output voltage is input through analog input terminal AI1. For details, refer to the P05 group parameters. The AI1 terminal inputs current or voltage signals, and the corresponding frequency value is calculated based on the set AI curve.

2: Same as 1, input via analog input terminal AI2.

3: Same as 1, input via analog input terminal AI3.

4: Pulse setting (DI5)

The V/F decoupled voltage is set via high-speed pulse input. For pulse input settings, refer to the P05 group parameters.

5: Multi-Segment command

When selecting multi-segment commands as the V/F decoupled voltage, different set values correspond to different combinations of states of the digital input DI terminals.

6: Simple PLC

The VFD's output voltage is set via a simple PLC. For details, refer to the simple PLC function description.

7: PID

The VFD's output voltage is set by PID operation. For PID control details, refer to the P08 group parameters.

8: Communication setpoint

VFD output voltage is set via communication.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.22	V/F decoupled voltage rise time	0~100s	uint16	0	W	0x0416
P04.23	V/F decoupled voltage fall time	0~100s	uint16	0	W	0x0417
P04.24	V/F decoupled stopping mode selection	0: Frequency/Voltage independently decreases to 0 1: Voltage decreases to 0 first, then frequency decreases	uint16	0	W*	0x0418

The rise and fall times of the V/F decoupled voltage command are used to set the output voltage change rate in V/F decoupled mode. This time refers to the rise time from 0V to the motor rated voltage or the fall time from the motor rated voltage to 0V.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P04.25	V/F overvoltage stall trip voltage	330V~800V	uint16	Model setting	W*	0x0419
P04.26	V/F overvoltage stall enable	0: Inactive 1: Active	uint16	1	W*	0x041a
P04.27	V/F overvoltage stall suppression frequency gain	0~100	uint16	30	W	0x041b
P04.28	V/F overvoltage stall suppression frequency gain	0~100	uint16	30	W	0x041c

P04.29	Overvoltage stall maximum up-limited frequency	0~50Hz	uint16	5Hz	W*	0x041d

During VFD operation, if the bus voltage exceeds the overvoltage stall trip voltage (P04.25), the VFD enters a generating state, triggering overvoltage stall regulation to adjust the output frequency. The frequency will only gradually return to normal after the voltage drops below the overvoltage trip voltage. The overvoltage stall strategy increases the deceleration time. If the actual deceleration time is too long to meet requirements, the overvoltage stall trip voltage (P04.25) can be appropriately increased.

V/F overvoltage stall trip voltage: When the bus voltage exceeds this value, the VFD enables the overvoltage stall function. Default values vary by model.

V/F overvoltage stall enable: 0: V/F overvoltage stall disabled; 1: V/F overvoltage stall enabled. Overvoltage stall is enabled by default.

V/F overvoltage stall suppression frequency gain: Indicates the speed at which the VFD adjusts the output frequency when an overvoltage stall is triggered. Increasing this value enhances bus voltage control but may cause larger output frequency fluctuations. If output frequency fluctuations are significant when the overvoltage stall is enabled, reduce this value.

V/F overvoltage stall suppression voltage gain: Indicates the speed at which the VFD adjusts the output voltage when an overvoltage stall is triggered. Increasing this value improves bus voltage control and reduces the overshoot of the bus voltage when the overvoltage stall is enabled.

Overvoltage stall maximum upper limited frequency: After the overvoltage stall is triggered, the VFD may increase the output frequency. This value is the maximum increment of the output frequency.

Note: When using a braking resistor, adding a braking unit, or employing an energy feedback unit, please note:

1. Set P04.08 "V/F over-excitation gain" to "0" to avoid excessive operating current.

2. Set P04.26 "V/F overvoltage stall enable" to "0" to avoid extended deceleration time.

4.6 P05 Input terminal parameter group

The E630 series VFD standard unit is equipped with 6 multi-functional digital input terminals (DI1 and HDI can also serve as high-speed pulse input terminals) and 2 analog input terminals.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.00	DI1 terminal function selection	Set values are detailed in the table below.	uint16	0	W*	0x0500
P05.01	DI2 terminal function selection		uint16	0	W*	0x0501
P05.02	DI3 terminal function selection		uint16	0	W*	0x0502
P05.03	DI4 terminal function selection		uint16	0	W*	0x0503
P05.04	DI5 terminal function selection		uint16	0	W*	0x0504
P05.05	DI6 terminal function selection		uint16	0	W*	0x0505
P05.06	DI7 terminal function selection		uint16	0	W*	0x0506
P05.07	DI8 terminal function selection		uint16	0	W*	0x0507
P05.08	DI9 terminal function selection		uint16	0	W*	0x0508
P05.09	DI10 terminal function selection		uint16	0	W*	0x0509

This parameter is used to set the function corresponding to each multi-functional digital input terminal.

Set value	Function	Description
0	No function	Even if a signal is input to the VFD, it does not operate. Unused terminals can be set to no function to prevent malfunction.
1	Forward operation (FWD)	The VFD's forward and reverse rotation can be controlled via external terminals.
2	Reverse operation (REV)	
3	Three-wire operation control	This terminal determines whether the VFD operates in three-wire control mode. For detailed descriptions, refer to the function code introduction of P05.13 (three-wire control Mode).
4	Forward jog (FJOG)	FJOG indicates forward jog operation, and RJOG indicates reverse jog operation. For frequency and jog acceleration/deceleration time during jog operation, refer to the detailed descriptions of function codes P01.10, P01.11, and P01.12.
5	Reverse jog (RJOG)	
6	Terminal UP	When frequency is given by an external terminal, modify the frequency increment/decrement commands. If the frequency source is set to digital setting, the set frequency can be adjusted up or down.
7	Terminal DOWN	
8	Coast stop	The VFD blocks its output, and the motor stopping process is not controlled by the VFD. This is a commonly used method for high-inertia loads with no requirement for stopping time. This mode has the same meaning as the "coast stop" described in P01.05.
9	Fault reset (RESET)	External fault reset function. It has the same function as the RESET key on the keypad. This function enables remote fault reset.

10	Operation pause	The VFD decelerates to stop, but all operating parameters (e.g., PLC parameters, swing frequency parameters, PID parameters) remain in memory. After this signal disappears, the VFD resumes operation to the state before stopping.
11	External fault normally open input	When an external fault signal is sent to the VFD, the VFD reports a fault and handles it according to the fault protection action mode (P13.41 ~ P13.44).
12	Multi-speed terminal 1	A total of 16 speed settings can be achieved through the digital state combinations of these four terminals. Detailed combinations are shown in Table 25.
13	Multi-speed terminal 2	
14	Multi-speed terminal 3	
15	Multi-speed terminal 4	
16	Acceleration/Deceleration time selection terminal 1	Four acceleration/deceleration times can be selected through the digital state combinations of these two terminals. Detailed combinations are shown in Table 26.
17	Acceleration/Deceleration time selection terminal 2	
18	Frequency source switch	When the frequency source selection (units digit of P00.05) is set to 2, this terminal is used to switch between the main frequency source X and the auxiliary frequency source Y. When the frequency source selection (units digit of P00.05) is set to 3, this terminal is used to switch between the main frequency source X and the main-auxiliary operation result. When the frequency source selection (units digit of P00.05) is set to 4, this terminal is used to switch between the auxiliary frequency source Y and the main-auxiliary operation result.
19	UP/DOWN setting clear (terminal/keypad)	When the frequency is set via digital frequency setting, this terminal can clear the frequency value changed by UP/DOWN, restoring the set frequency to the value configured by P00.12.
20	Operation command switch terminal	When the command source (P00.02) is set to 1, this terminal is used to switch between terminal control and keypad control. When the command source (P00.02) is set to 2, this terminal is used to switch between communication control and keypad control.
21	Acceleration/Deceleration inhibit	Ensures the VFD is not affected by external signals (except stop commands) and maintains the current output frequency.
22	PID pause	PID is temporarily disabled, and the VFD maintains the current frequency output.
23	PLC status reset	The PLC pauses during execution and can be restored to the initial state of the simple PLC via this terminal when operation resumes.
24	Swing frequency pause	The VFD outputs at the center frequency. Swing frequency is paused.
25	Counter input	Input terminal for counting pulses.
26	Counter reset	Resets the counter status.
27	Length count input	Input terminal for length counting.
28	Length reset	Resets the length count.
29	Torque control inhibit	Prohibits the VFD from operating in torque control mode.
30	Pulse frequency input (valid only for DI1 and HDI)	This is a pulse input terminal.
31	Reserved	
32	Immediate DC braking	When this terminal is active, the VFD directly switches to the DC braking state.
33	External fault normally closed input	After an external fault signal is sent to the VFD, the VFD reports a fault and handles it according to the fault protection action mode (P13.41 ~ P13.44).
34	Frequency setting taking effect	If this terminal function is set, when the frequency is modified, the activation timing of the modification is controlled by the effectiveness of this terminal.
35	Invert PID action direction	When this terminal is active, the PID action direction is opposite to the direction set by P08.03.

36	External stop terminal 1	During keypad control, this terminal can be used to stop the VFD, equivalent to the STOP key on the keypad.
37	Control command switch terminal 2	Used to switch between terminal control and communication control. When this terminal is active: If P00.02 is set to terminal control, it switches to communication control; If P00.02 is set to communication control, it switches to terminal control.
38	PID integration pause	When this terminal is active, the PID integral action is paused, but the proportional and differential adjustments remain effective.
39	Switch frequency source X with preset frequency	When this terminal is active, frequency source X is replaced by the preset frequency (P00.12).
40	Switch frequency source Y with preset frequency	When this terminal is active, frequency source Y is replaced by the preset frequency (P00.12).
41	Motor selection 1	The digital state of this terminal is used to select 2 sets of motor parameters; detailed combinations are shown in Table 27.
42	Motor selection 2	Reserved
43	PID parameter switch terminal	When P08.11 (PID parameter switching condition) is a DI terminal, if this terminal is active, the PID uses parameters P08.08 ~ P08.10. If the terminal is inactive, it uses parameters P08.05 ~ P08.07.
44	User-defined fault 1	After an external fault signal is sent to the VFD, the VFD reports a fault and handles it according to the fault protection action mode (P13.41 ~ P13.45).
45	User-defined fault 2	After an external fault signal is sent to the VFD, the VFD reports a fault and handles it according to the fault protection action mode (P13.41 ~ P13.45).
46	Speed control/torque control switch	Switches the VFD between torque control and speed control modes. When this terminal is inactive, the VFD operates in the mode defined by P03.38 (speed/torque control mode); when active, it switches to the other mode.
47	Emergency stop	When this terminal is active, the VFD stops at the fastest speed.
48	External stop terminal 2	Under any control mode, this terminal can be used to stop the VFD, stopping with deceleration time 4.
49	Deceleration DC braking	When this terminal is active, the VFD first decelerates to the DC braking start frequency and then switches to the DC braking state.
50	Reset current operation time	Clears the current operation time value of P28.01.

Table 10. Multi-speed function description

K4	K3	K2	K1	Frequency setting	Corresponding parameter
OFF	OFF	OFF	OFF	Multi-speed 0	P11.01
OFF	OFF	OFF	ON	Multi-speed 1	P11.02
OFF	OFF	ON	OFF	Multi-speed 2	P11.03
OFF	OFF	ON	ON	Multi-speed 3	P11.04
OFF	ON	OFF	OFF	Multi-speed 4	P11.05
OFF	ON	OFF	ON	Multi-speed 5	P11.06
OFF	ON	ON	OFF	Multi-speed 6	P11.07
OFF	ON	ON	ON	Multi-speed 7	P11.08
ON	OFF	OFF	OFF	Multi-speed 8	P11.09
ON	OFF	OFF	ON	Multi-speed 9	P11.10
ON	OFF	ON	OFF	Multi-speed 10	P11.11
ON	OFF	ON	ON	Multi-speed 11	P11.12
ON	ON	OFF	OFF	Multi-speed 12	P11.13
ON	ON	OFF	ON	Multi-speed 13	P11.14
ON	ON	ON	OFF	Multi-speed 14	P11.15
ON	ON	ON	ON	Multi-speed 15	P11.16

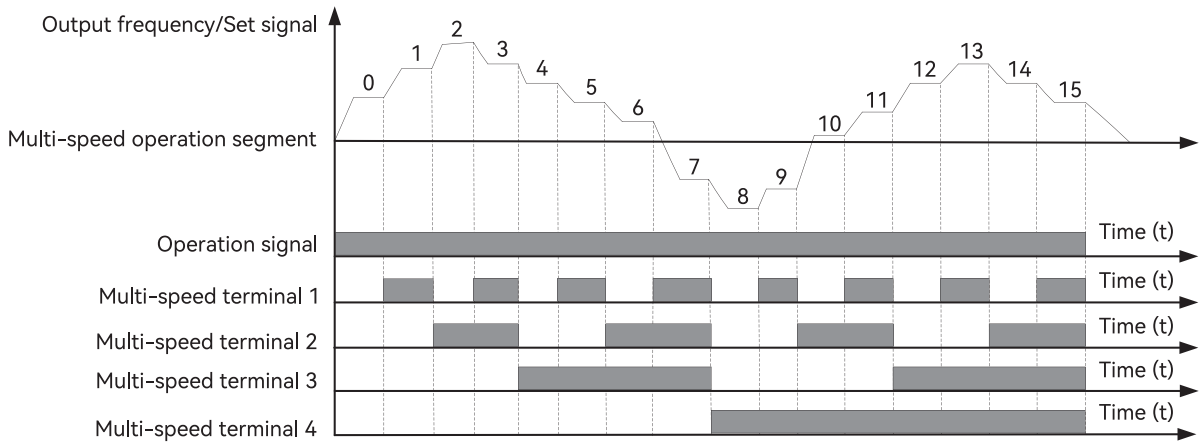


Figure 21. Terminal-Controlled multi-speed diagram

Table 11. Multi-speed function description 2

Terminal 2	Terminal 1	Acceleration/Deceleration time selection	Corresponding parameter
OFF	OFF	Acceleration time 1	P00.13, P00.14
OFF	ON	Acceleration time 2	P01.41, P01.42
ON	OFF	Acceleration time 3	P01.43, P01.44
ON	ON	Acceleration time 4	P01.45, P01.46

Table 12. Multi-speed function description 3

Terminal 1	Motor selection	Corresponding parameter group
OFF	Motor 1	P02, P03 group
ON	Motor 2	P20 group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.10	DI input terminal active state setting 1	Units digit: DI1 0: High level active 1: Low level active Tens digit: DI2 0: High level active 1: Low level active Hundreds digit: DI3 0: High level active 1: Low level active Thousands digit: DI4 0: High level active 1: Low level active Tens of thousands digit: DI5 0: High level active 1: Low level active	uint16	00000	W	0x050a

P05.11	DI input terminal active state setting 2	Units digit: HDI 0: High level active 1: Low level active Tens digit: Reserved 0: High level active 1: Low level active Hundreds digit: Reserved 0: High level active 1: Low level active Thousands digit: Reserved 0: High level active 1: Low level active Tens of thousands digit: Reserved 0: High level active 1: Low level active	uint16	00000	W	0x050b

Define the active state setting of input terminals.

Select high-level active: The corresponding DI terminal and 24V terminal are active (functional) when connected (closed), and inactive (non-functional) when disconnected (open).

Select low-level active: The corresponding DI terminal and COM terminal are inactive (non-functional) when connected (closed), and active (functional) when disconnected (open).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.12	DI filtering time	0s~1s	uint16	0.01s	W	0x050c
P05.13	Terminal command mode	0: Two-wire mode 1 1: Two-wire mode 2 2: Three-wire mode 1 3: Three-wire mode 2	uint16	0	W*	0x050d

This parameter defines four different modes for controlling VFD operation via external terminals.

◆ 0: Two-wire mode 1

This is the most commonly used two-wire mode. Short-circuit the SS and 24V terminals, set the DIn terminals to FWD and REV functions respectively, and use the FWD/REV terminal commands to determine the motor's forward/reverse rotation.

When K1 is closed and K2 is open, VFD runs forward. When K1 is open and K2 is closed, VFD runs in reverse. When K1 and K2 are in the same state (both closed or both open), VFD stops.

K1	K2	Operation command
0	0	Stop
1	0	Forward rotation
0	1	Reverse rotation
1	1	Stop

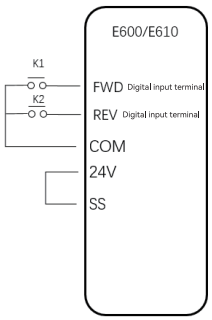


Figure 22. Two-wire mode 1

◆ 1: Two-wire mode 2

In this mode, short-circuit the SS and 24V terminals, set the DIn terminals to FWD and REV functions respectively (REV serves as the enable terminal). Direction is determined by the state of FWD. Function settings are as follows:

When K1 is open, VFD stops regardless of K2's state (open or closed). When K1 is closed and K2 is open, the VFD runs forward. When K2 is closed, VFD runs in reverse.

K1	K2	Operation command
0	0	Stop
0	1	Stop
1	0	Forward rotation
1	1	Reverse rotation

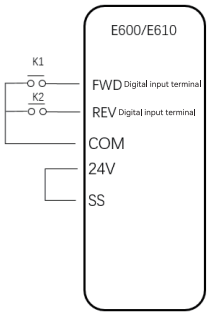


Figure 23. Two-wire mode 2

◆ 2: Three-wire mode 1

Set DIn1 and DIn2 terminals to FWD and REV functions respectively, and DIn3 to the three-wire operation control function. Use DIn3 to control operation enable; direction is controlled by FWD/REV. Function settings are as follows:

When K2 is closed and K1 is closed, VFD runs forward.

When K3 is closed, VFD runs in reverse. When K2 is open, VFD stops. During VFD operation, K2 must remain closed; forward/reverse commands take effect based on the final closing action edge of K1/K3.

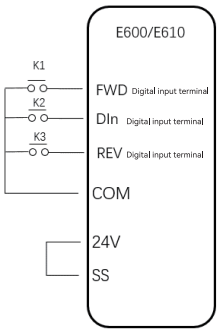


Figure 24. Three-wire mode 1

◆ 3: Three-wire mode 2

Set DIn1 and DIn2 terminals to FWD and REV functions respectively, and DIn to the three-wire operation control function. In this mode, DIn is the operation enable command, FWD is the operation command, REV is the direction command, and the stop command is triggered by disconnecting the DIn signal. Function settings are as follows:

Close and hold the K2 terminal. When the K1 terminal is closed, a closing action edge is generated, and the VFD starts running. While the VFD is running, if the K3 terminal is opened, the VFD runs forward; if the K3 terminal is closed, the VFD runs in reverse. Opening the K2 terminal stops the VFD.

K3	Operation direction selection
0	Forward rotation
1	Reverse rotation

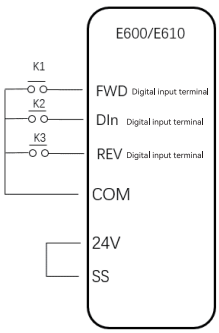


Figure 25. Three-wire mode 2

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.14	UP/DOWN terminal change rate per second	0.001~65.535	uint16	1	W	0x050e

The UP/DOWN terminal adjusts the change rate of the set frequency.

When P00.18 (frequency command decimal point) is set to 2, the value range is 0.001 Hz/s to 65.535 Hz/s.

When P00.18 (frequency command decimal point) is set to 1, the value range is 0.01 Hz/s to 655.35 Hz/s.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.15	AI curve 1 minimum input	0V~P05.17	uint16	0v	W	0x050f
P05.16	AI curve 1 minimum input corresponding setting	-100%~100%	uint16	0%	W	0x0510
P05.17	AI curve 1 maximum input	P05.15~10v	uint16	10v	W	0x0511
P05.18	AI curve 1 maximum input corresponding setting	-100%~100%	uint16	100%	W	0x0512
P05.19	AI1 filtering time	0s~10s	uint16	0.1s	W	0x0513

These function codes define the relationship between the analog input voltage and the set value represented by the analog input. When the analog input voltage exceeds the maximum input (P05.17), the analog voltage will be calculated based on the maximum input. When the analog input voltage is below the minimum input, the analog voltage will be calculated as either the minimum input or 0.0% based on the AI minimum input setting (P05.36).

When the analog input is a current input, 1mA current corresponds to 0.5V voltage. In different application scenarios, the nominal value corresponding to 100% of the analog setting may vary; refer to the specific application section descriptions for details.

The following diagrams illustrate several typical settings:

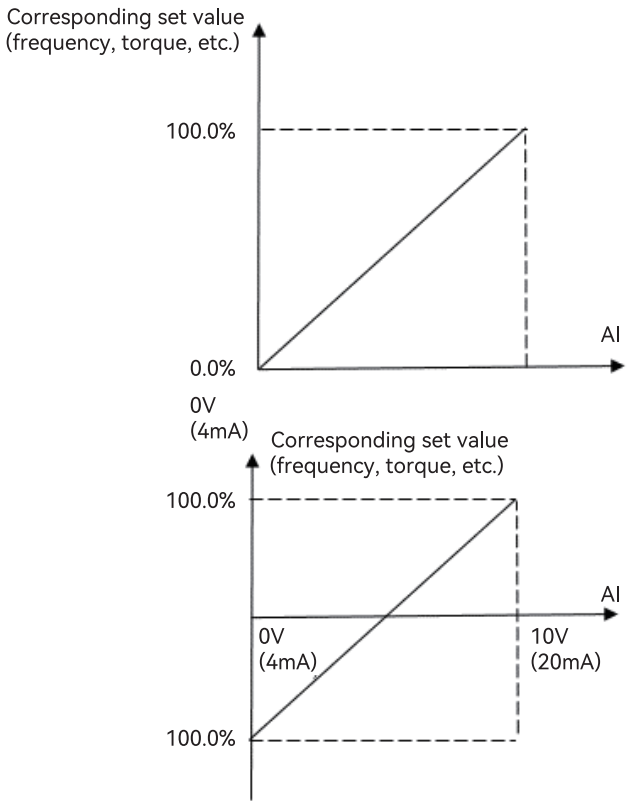


Figure 26. Correspondence between analog input and set value

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.20	AI curve 2 minimum input	0V~P05.22	uint16	0v	W	0x0514
P05.21	AI curve 2 minimum input corresponding setting	-100%~100%	uint16	0%	W	0x0515
P05.22	AI curve 2 maximum input	P05.20~10v	uint16	10v	W	0x0516
P05.23	AI curve 2 maximum input corresponding setting	-100%~100%	uint16	100%	W	0x0517
P05.24	AI2 filtering time	0s~10s	uint16	0.1s	W	0x0518

The functions of curve 2 are similar to the setting methods of curve 1.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.25	AI curve 3 minimum input	0V~P05.27	uint16	0v	W	0x0519
P05.26	AI curve 3 minimum input corresponding setting	-100%~100%	uint16	0%	W	0x051a
P05.27	AI curve 3 maximum input	P05.25~10V	uint16	10v	W	0x051b
P05.28	AI curve 3 maximum input corresponding setting	-100%~100%	uint16	100%	W	0x051c
P05.29	AI3 filtering time	0s~10s	uint16	0.1s	W	0x0518

The functions of curve 3 are similar to the setting methods of curve 1.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.30	PULSE minimum input	0KHz~P05.32	uint16	0KHz	W	0x051e
P05.31	PULSE minimum input corresponding setting	-100%~100%	uint16	0%	W	0x051f
P05.32	PULSE maximum input	P05.30~100KHz	uint16	50KHz	W	0x0520
P05.33	PULSE maximum input setting	-100%~100%	uint16	100%	W	0x0521
P05.34	PULSE filtering time	0s~10s	uint16	0.1s	W	0x0522

This group of function codes defines the correspondence when pulses are used as the frequency setting method. Pulse frequency input can only be provided via the DI1 channel (for E630, via DI1 or HDI). The application of this group of functions is similar to that of curve 1.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.35	AI set curve selection	0x11~0x55	uint16	0x21	W	0x0523

It defines the set curves corresponding to AI1/AI2. The standard unit of E600/E630 VFD provides 2 analog input ports.

Setting range

Units digit: AI1 curve selection

1: Curve 1 (2 points, refer to P05.15 ~ P05.18)

2: Curve 2 (2 points, refer to P05.20 ~ P05.23)

3: Curve 3 (2 points, refer to P05.25 ~ P05.28)

4: Curve 4 (4 points, refer to P05.41 ~ P05.48)

5: Curve 5 (4 points, refer to P05.49 ~ P05.56)

Tens digit: AI2 curve selection (1~6, same as above)

Hundreds digit: Reserved

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.36	AI below minimum input setting selection	0x000~0x111	uint16	0x0	W	0x0524

If set to 0, when the AI input is below the minimum input, the physical quantity is set to the value corresponding to the curve's minimum input setting.

If set to 1, when the AI input is below the minimum input, the physical quantity is set to 0.0%.

Setting range

Units digit: AI1 below minimum input setting selection

0: Corresponding setting of minimum input

1: 0.0%

Tens digit: AI2 below minimum input setting selection (0~1, same as above)

Hundreds digit: Reserved

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.37	DI1 delay time	0s~3600s	uint16	0s	W	0x0525
P05.38	DI2 delay time	0s~3600s	uint16	0s	W	0x0526
P05.39	DI3 delay time	0s~3600s	uint16	0s	W	0x0527

Set the delay time from the change in DI terminal status to the VFD's response.

Currently, only DI1/DI2/DI3 have the function of setting delay time.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.40	High-speed DI selection for frequency source	0: DI1 1: HDI	uint16	0	W	0x0528

When the frequency source is selected as a high-speed pulse, use this sub-function code to select DI1 or HDI as the frequency source input.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.41	AI curve 4 minimum input	-10v~P05.43	uint16	0v	W	0x0529
P05.42	AI curve 4 minimum input corresponding setting	-100%~100%	uint16	0%	W	0x052a
P05.43	AI curve 4 median value 1 input	P05.41~P05.45	uint16	3v	W	0x052b
P05.44	AI curve 4 median value 1 input corresponding setting	-100%~100%	uint16	30%	W	0x052c
P05.45	AI curve 4 median value 2 input	P05.43~P05.47	uint16	6v	W	0x052d
P05.46	AI curve 4 median value 2 input corresponding setting	-100%~100%	uint16	60%	W	0x052e
P05.47	AI curve 4 maximum input	P05.45~10v	uint16	10v	W	0x052f
P05.48	AI curve 4 maximum input corresponding setting	-100%~100%	uint16	100%	W	0x0530
P05.49	AI curve 5 minimum input	-10V~P05.51	uint16	-10v	W	0x0531

P05.50	AI curve 5 minimum input corresponding setting	-100%~100%	uint16	-100%	W	0x0532
P05.51	AI curve 5 median value 1 input	P05.49~P05.53	uint16	-3v	W	0x0533
P05.52	AI curve 5 median value 1 input corresponding setting	-100%~100%	uint16	-30%	W	0x0534
P05.53	AI curve 5 median value 2 input	P05.51~P05.55	uint16	3v	W	0x0535
P05.54	AI curve 5 median value 2 input corresponding setting	-100%~100%	uint16	30%	W	0x0536
P05.55	AI curve 5 maximum input	P05.53~10v	uint16	10v	W	0x0537
P05.56	AI curve 5 maximum input corresponding setting	-100%~100%	uint16	100%	W	0x0538

Curve 4 and 5 functions are similar to curves 1, 2, and 3, but curves 1, 2, and 3 are straight lines, while curves 4 and 5 add 2 inflection points to form 4-point curves, enabling flexible correspondence relationships. The following diagram illustrates the schematic of curves 4 and 5:

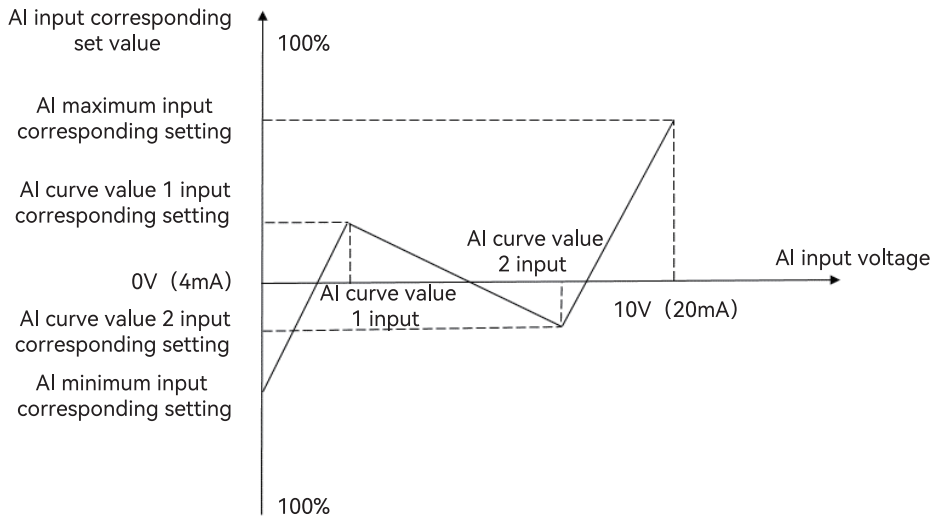


Figure 27. AI curve setting diagram

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.57	AI1 jump point	-100%~100%	int16	0%	W	0x0539
P05.58	AI1 jump amplitude	0%~100%	uint16	0.5%	W	0x053a
P05.59	AI2 jump point	-100%~100%	int16	0%	W	0x053b
P05.60	AI2 jump amplitude	0%~100%	uint16	0.5%	W	0x053c
P05.61	AI3 jump point	-100%~100%	int16	0	W	0x053d
P05.62	AI3 jump amplitude	0%~100%	uint16	0.5	W	0x053e

Sets the AI set value jump function. If jump point - amplitude < actual value < jump point + amplitude, the AI given value is the AI set jump point.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.63	AI1 pre-correction voltage 1 setting	0.50~4.00	uint16	2.00	W	0x053d

P05.64	AI1 post-correction voltage 1 setting	0.50~4.00	uint16	2.00	W	0x053e
P05.65	AI1 pre-correction voltage 2 setting	6.00~9.99	uint16	8.00	W	0x053f
P05.66	AI1 post-correction voltage 2 setting	6.00~9.99	uint16	8.00	W	0x0540

When performing analog voltage correction on the AI1 terminal, a correction curve is formed using 2 points, where each point corresponds to a measured voltage and a displayed voltage. The AI1 pre-correction voltage setting is the actual measured voltage value by the instrument, and the AI1 post-correction voltage setting is the displayed AI1 pre-correction voltage (P28.30).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.67	AI2 pre-correction voltage 1 setting	0.50~4.00	uint16	2.00	W	0x0541
P05.68	AI2 post-correction voltage 1 setting	0.50~4.00	uint16	2.00	W	0x0542
P05.69	AI2 pre-correction voltage 2 setting	6.00~9.99	uint16	8.00	W	0x0543
P05.70	AI2 post-correction voltage 2 setting	6.00~9.99	uint16	8.00	W	0x0544

When performing analog voltage correction on the AI2 terminal, a correction curve is formed using 2 points, where each point corresponds to a measured voltage and a displayed voltage. The AI2 pre-correction voltage setting is the actual measured voltage value by the instrument, and the AI2 post-correction voltage setting is the displayed AI2 pre-correction voltage (P28.31).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.71	AI3 pre-correction voltage 1 setting	0.50~4.00	uint16	2	W	0x0547
P05.72	AI3 post-correction voltage 1 setting	0.50~4.00	uint16	2	W	0x0548
P05.73	AI3 pre-correction voltage 2 setting	6.00~9.99	uint16	8	W	0x0549
P05.74	AI3 post-correction voltage 2 setting	6.00~9.99	uint16	8	W	0x054a

When performing analog voltage correction on the AI3 terminal, a correction curve is formed using 2 points, where each point corresponds to a measured voltage and a displayed voltage. The AI3 pre-correction voltage setting is the actual measured voltage value by the instrument, and the AI3 post-correction voltage setting is the displayed AI3 pre-correction voltage (P28.32).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P05.75	AI2 type	0: 4-20mA current type 1: 0-20mA current type 2: 0-10V voltage type	uint16	0	W	0x0545

Select the input type of the AI2 terminal.

0: 4-20mA current type

1: 0-40mA current type

2: 0-10V voltage type

4.7 P06 Output terminal parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.01	Control board relay output selection	0: No output 1: The VFD is running 2: Fault output (fault shutdown) 3: Frequency level detection FDT1 output 4: Frequency reached 5: Zero speed operation (no output when stopped) 6: Motor overload pre-alarm 7: VFD overload pre-alarm 8: Set count value reached 9: Specified count value reached 10: Length reached 11: PLC cycle completed 12: Operation time reached 13: Frequency limited 14: Torque limited 15: Operation ready 16: AI1 > AI2 17: Upper frequency reached 18: Lower frequency reached (related to operation) 19: Undervoltage status output 20: Communication setting 21: Positioning completed (reserved) 22: Positioning approaching (reserved) 23: Zero Speed operation 2 (output when stopped) 24: Power-on time reached 25: Frequency level detection FDT2 output 26: Frequency reached 1 output 27: Frequency reached 2 output 28: Current reached 1 output 29: Current reached 2 output 30: Timer reached output 31: AI1 input exceeds upper/lower limit 32: Load shedding 33: Operation direction 34: Zero current detection 35: Module temperature reached 36: Software overcurrent output 37: Lower frequency reached (unrelated to operation) 38: Fault output (keep running) 39: Motor over-temperature pre-alarm 40: Current operation time reached 41: Fault output	uint16	2	W	0x0601
P06.02	DO1 output selection		uint16	1	W	0x0602
P06.03	DO2 output selection		uint16	0	W	0x0603

Used to select the function of digital output, where T/A-T/B-T/C are relays on the VFD.

0: The output terminal has no function.

1: When the VFD is in operation (output frequency can be zero), the DO outputs an "active" signal.

2: When the VFD stops due to a fault, the DO outputs an "active" signal.

3: When the operating frequency is higher than the frequency detection value, the DO outputs an "active" signal; when the operating frequency is lower than the detection value minus the FDT hysteresis value (product of P09.00 and P09.01), the DO "active" signal is canceled.

4: When the VFD operating frequency is within a certain range of the target frequency (target frequency = product of P09.04 setting value and maximum frequency), the DO outputs an "active" signal.

5: When the VFD is running and the output frequency is 0, the DO outputs an "active" signal. When the VFD is in a stopped state, this signal is "inactive."

6: Before the motor overload protection activates, based on the pre-overload coefficient (P13.03), the DO outputs an "active" signal after exceeding the pre-alarm threshold.

7: The DO outputs an "active" signal 10 seconds before the VFD overload protection occurs.

8: In the counting function, when the counted value reaches the setting value of P09.13, the DO outputs an "active" signal.

9: In the counting function, when the counted value reaches the setting value of P09.14, the DO outputs an "active" signal.

10: In the fixed-length function, when the detected actual length exceeds the setting value of P09.10, the DO outputs an "active" signal.

11: After the simple PLC completes one cycle of operation, it outputs a 250ms-wide pulse signal.

12: When the VFD cumulative operating time exceeds the setting value of P09.16 (set operating arrival time), the DO outputs an "active" signal.

13: When the set frequency exceeds the upper/lower frequency limit, and the VFD output frequency reaches the upper/lower frequency limit, the DO outputs an "active" signal.

14: In speed control mode, when the VFD output torque reaches the torque limit value, the DO outputs an "active" signal.

15: After the VFD is powered on and in a normal (no fault) state, the DO outputs an "active" signal.

16: When the value of analog input AI1 is greater than the value of AI2, the DO outputs an "active" signal.

17: When the operating frequency reaches the upper frequency limit (P00.10), the DO outputs an "active" signal.

18: When P01.20 (operation below lower frequency mode) is set to 1 (stopped), the DO outputs an "inactive" signal regardless of whether the operating frequency reaches the lower limit. When P01.20 is set to 0 (operation at lower frequency) or 2 (zero-speed operation), and the operating frequency reaches the lower limit, the DO outputs an "active" signal.

19: When the VFD is in an undervoltage state, the DO outputs an "active" signal.

20: The "active" or "inactive" state of the terminal is controlled by the setting value of communication address 0x6001.

21: Reserved

22: Reserved

23: When the VFD is running and the output frequency is 0, the DO outputs an "active" signal. When the VFD is stopped, this signal remains "active."

24: When the VFD cumulative power-on time (P10.11) exceeds the setting value of P09.17 (set power-on arrival time), the DO outputs an "active" signal.

25: When the operating frequency is higher than the frequency detection value, the DO outputs an "active" signal; when the operating frequency is lower than the detection value minus the frequency detection hysteresis value (product of P09.02 setting value and P09.03), the DO "active" signal is canceled.

26: When the VFD operating frequency is within the (frequency detection value 1) range, the DO outputs an "active" signal. Frequency detection range: (P09.22 - P09.23 × 0.08 (maximum frequency)) ~ (P09.22 + P09.23 × 0.08).

27: When the VFD operating frequency is within the (frequency detection value 2) range, the DO outputs an "active" signal. Frequency detection range: (P09.24 - P09.25 × 0.08 (maximum frequency)) ~ (P09.24 + P09.25 × 0.08).

28: When the VFD output current is within the range of P13.34 (current detection value 1), the DO outputs an "active" signal. Current detection range: (P13.34 - P13.35 × 0.08 (motor rated current)) ~ (P13.34 + P13.35 × 0.08).

29: When the VFD output current is within the range of P13.36 (current detection value 1), the DO outputs an "active" signal. Current detection range: (P13.36 - P13.37 × 0.08 (motor rated current)) ~ (P13.36 + P13.37 × 0.08).

30: When the timing function selection (P09.26) is active, after the VFD's current running time reaches the set timing time (configured by P09.27 and P09.28), the DO outputs an "active" signal.

31: When the value of analog input AI1 exceeds P13.38 (AI1 input protection upper limit) or is less than P13.39 (AI1 input protection lower limit), the DO outputs an "active" signal.

32: When the VFD is in a load loss state, the DO outputs an "active" signal.

33: When the VFD is operating in reverse, the DO outputs an "active" signal.

34: When the VFD output current is within the zero-current range and the duration exceeds P13.30 (zero-current detection delay time), the DO outputs an "active" signal. Zero-current detection range: 0 ~ P13.31 × 02.03.

35: When the controller temperature (P28.19) reaches the set module temperature reach value (P13.40), the DO outputs an "active" signal.

36: When the VFD output current exceeds P13.32 (software overcurrent point) and the duration exceeds P13.33 (software overcurrent detection delay time), the DO outputs an "active" signal.

37: When the operating frequency reaches the lower frequency limit (P00.10), the DO outputs an "active" signal. When the VFD is stopped, this signal remains "active."

38: When the VFD malfunctions and the fault protection action is set to "continue operation," the DO terminal outputs an "active" signal.

39: When the motor temperature reaches P13.13 (motor overheat pre-alarm threshold) (motor temperature can be viewed via P28.20), the DO outputs an "active" signal.

40: When the VFD's current running time exceeds the setting value of P09.33 (current running arrival time), the DO outputs an "active" signal.

41: When the VFD malfunctions, the DO outputs an "active" signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.04	AO1 output selection	0: Operating frequency 1: Set frequency 2: Output current (Maximum output value is twice the motor rated current.) 3: Output torque (Maximum output value is twice the motor rated torque.) 4: Output power 5: Output voltage (Maximum output value is 1.2 times the VFD rated voltage.) 6: PULSE input 7: AI1 8: AI2 10: Length 11: Count value 12: Communication setting 13: Motor speed 14: Output current (Maximum output value is 1000A.) 15: Output voltage (Maximum output value is 1000V.) 16: Output torque (Maximum output value is twice the motor rated torque, with direction.)	uint16	0	W	0x0604
P06.05	AO2 output selection		uint16	0	W	0x0605
P06.06	HDO output selection		uint16	0	W	0x0606

The standard analog output (zero offset = 0, gain = 1) ranges from 0mA to 20mA (or 0V to 10V).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.08	AO1 zero offset coefficient	-100~100	uint16	0	W	0x0608
P06.09	AO1 gain	-10~10	uint16	1	W	0x0609
P06.10	AO2 zero offset coefficient	-100~100	uint16	0	W	0x0610
P06.11	AO2 gain	-10~10	uint16	0	W	0x0611

The standard analog output (zero offset = 0, gain = 1) ranges from 0mA to 20mA (or 0V to 10V).

If the zero offset is denoted as "b", the gain as "k", the actual output as "Y", and the standard output as "X", then the actual output is Y = kX + b; 100% of the AO1 zero offset coefficient corresponds to 10V (20mA). The standard output refers to the analog output range where 0V to 10V (20mA) corresponds to 0 to the maximum of the measured quantity. It is generally used to correct zero drift and output amplitude deviation of the analog output. Custom output curves can also be defined: For example, if the analog output content is operating frequency, and users want to output 8V (16.8mA) when the frequency is 0 and 3V (8.8mA) when the frequency is maximum, set the gain to "-0.50" and the zero offset to "80%".

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.12	Relay 1 output delay time	0s~3600s	uint16	0	W	0x060c

Control board relay 1 output delay time. After the set delay time, P06.01 outputs an active signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.13	DO1 output delay time	0s~3600s	uint16	0	W	0x060d
P06.14	DO2 output delay time	0s~3600s	uint16	0	W	0x060e

Set the delay time from the change in the status of the output relay, DO1, and DO2 to the change in their output.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.15	DO output terminal active state selection	Units digit: Relay 0: Positive logic 1: Negative logic Tens digit: DO1 0: Positive logic 1: Negative logic Hundreds digit: DO2 0: Positive logic 1: Negative logic	uint16	000	W	0x060b

Define the positive/negative logic of the output relay, DO1, and DO2.

Positive logic: The digital output terminal is active (functional) when connected to the corresponding common terminal, and inactive (non-functional) when disconnected.

Negative logic: The digital output terminal is inactive (non-functional) when connected to the corresponding common terminal, and active (functional) when disconnected.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P06.16	AO1 pre-correction voltage 1 setting	0.5~4V	uint16	2	W	0x0610
P06.17	AO1 post-correction voltage 1 setting	0.5~4V	uint16	2	W	0x0611
P06.18	AO1 pre-correction voltage 2 setting	6~9.999V	uint16	8	W	0x0612
P06.19	AO1 post-correction voltage 2 setting	6~9.999V	uint16	8	W	0x0613
P06.20	AO2 pre-correction voltage 1 setting	0.5~4V	uint16	2V	W	0x0614
P06.21	AO2 post-correction voltage 1 setting	0.5~4V	uint16	2V	W	0x0615
P06.22	AO2 pre-correction voltage 2 setting	6~9.999V	uint16	8V	W	0x0616
P06.23	AO2 post-correction voltage 2 setting	6~9.999V	uint16	8V	W	0x0617

When performing analog voltage correction on the AO terminal, a correction curve is formed using 2 points, where each point corresponds to a target voltage and a measured voltage. The AO pre-correction voltage setting is the expected output voltage, and the AO post-correction voltage setting is the actual measured output voltage.

4.8 P07 Synchronous machine control parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.04	Initial position detection	0: Detection 1: No detection	uint16	0	W	0x0704

Initial position angle detection prevents reverse rotation during startup.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.05	Synchronous machine SVC low-speed carrier frequency	8.0kHz~P00.25	uint16	1.5kHz	W	0x0705

It controls the carrier frequency in the low-speed range of the motor to reduce module heating at low speeds.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.06	Synchronous machine field weakening mode	0: No field weakening 1: Automatic adjustment mode	uint16	1	W	0x0706

0: No field weakening mode: The maximum speed the motor can reach is related to the VFD bus voltage. If the set speed exceeds the upper limit, the set speed cannot be achieved, but the output current will be smaller.

1: Automatic adjustment mode: The output current will increase in this mode. If a higher speed is desired, select this mode.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.07	Synchronous machine field weakening coefficient	1~50	uint16	5	W	0x0707

Increase P07.07 appropriately for scenarios requiring rapid field weakening, but excessive settings may cause current loop oscillation.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.08	Synchronous machine SVC initial excitation current amplitude limiting	0%~80%	uint16	30%	W	0x0708

In SVC mode, increase this value appropriately for applications requiring low-speed heavy-load starting.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.09	Synchronous machine inductance identification current	50%~180%	uint16	80%	W*	0x0709

For applications requiring adjustment of the current for synchronous machine inductance tuning, increase this value appropriately for high-speed motors.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.10	Initial position detection current	50%~180%	uint16	120%	W*	0x070a

Initial position angle detection prevents reverse rotation during startup. Enable this function for applications with strict startup requirements.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.14	Field weakening depth	0%~50%	uint16	5%	W	0x070e

Increasing this value improves response speed, but excessive values may cause current loop oscillation.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.15	Maximum output adjustment coefficient	50~500	uint16	100	W	0x070f

This value adjusts the output under MTPA (Maximum Torque Per Ampere) for salient-pole motors.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.20	Synchronous machine SVC speed filtering level	10~1000	uint16	100	W*	0x0714

Increase this value appropriately if the motor speed exhibits abnormal fluctuations.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.21	Synchronous machine SVC speed estimation proportional gain	5~200	uint16	40	W*	0x0715
P07.22	Synchronous machine SVC speed estimation integral gain	5~200	uint16	30	W	0x0716

The synchronous machine SVC observer gain is generally not modified.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P07.36	Initial position compensation angle	0° ~359.9°	uint16	0°	W	0x0724

It compensates for the motor's initial position. When initial position detection is disabled, appropriately selecting this value improves motor startup performance. A setting of 0° means no compensation.

4.9 P08 Process PID control parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.00	PID setpoint source	0: Numerical setpoint (P08.01) 1: AI1 2: AI2 4: PULSE 5: Communication 6: Multi-segment command	uint16	0	W	0x0800

When the frequency source is set to PID (i.e., P00.03 or P00.04 is set to 8), this parameter group becomes active (refer to function codes P00.03 and P00.04). This parameter determines the target quantity setpoint channel for the process PID. The set target quantity of the process PID is a relative value, where 100% corresponds to 100% of the feedback signal from the controlled system. The PID range (P08.04) is not mandatory, as the system operates based on relative values (0–100%) regardless of the range setting. However, if the PID range is configured, the actual values of the PID setpoint and feedback signals can be visually observed via the keypad-displayed parameters.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.01	PID numerical setpoint	0%~100%	uint16	50%	W	0x0801

The parameter is used for selecting process PID feedback signal channel. The feedback quantity of the process PID is also a relative value, with a set range of 0.0% to 100.0%.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.02	PID feedback source	0: AI1 1: AI2 3: AI1-AI2 4: PULSE 5: Communication 6: AI1+AI2 7: Maximum absolute value of AI1 and AI2 8: Minimum absolute value of AI1 and AI2	uint16	0	W	0x0802

This parameter selects the feedback signal channel for the process PID. The feedback quantity of the process PID is also a relative value, with a set range of 0.0%–100.0%.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.03	PID action direction	0: Forward 1: Reverse	uint16	0	W	0x0803

Positive action: When the feedback signal exceeds the PID setpoint, the VFD output frequency must decrease to balance the PID (e.g., tension PID control in winding applications).

Reverse action: When the feedback signal exceeds the PID setpoint, the VFD output frequency must increase to balance the PID (e.g., tension PID control in unwinding applications).

The effect of this function is influenced by terminal function 35: PID action direction inversion.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.04	PID setpoint-feedback range	0~65535	uint16	1000	W	0x0804

The PID setpoint-feedback range is a dimensionless unit used for PID setpoint display (P28.39) and PID feedback display (P28.40).

A relative value of 100.0% for the PID setpoint-feedback corresponds to the setpoint-feedback range P08.04. For example, if P08.04 is set to 2000, the PID setpoint display (P28.39) will show 2000 when the PID setpoint is 100.0%.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.05	Proportional gain P	0~100	uint16	20	W	0x0805
P08.06	Integral time I	0.01~10.00	uint16	2	W	0x0806
P08.07	Derivative time D	0~10	uint16	0	W	0x0807

Proportional gain P:

It determines the adjustment strength of the entire PID regulator. A larger P value indicates stronger adjustment strength. When the deviation between the PID feedback quantity and setpoint is 100%, a P value of 100 means the PID regulator will adjust the output frequency command to its maximum frequency (ignoring integral and derivative actions).

Integral time I:

It determines the speed at which the PID regulator performs integral adjustment on the deviation between the PID feed-

back quantity and the setpoint. Integral time refers to the duration required for the integral regulator (ignoring proportional and derivative actions) to continuously adjust and reach the maximum frequency (P00.08) when the deviation between feedback and setpoint is 100%. A shorter integral time corresponds to a stronger adjustment strength.

Derivative time D:

It determines the adjustment strength of the PID regulator in response to the rate of change of the deviation between the PID feedback quantity and the setpoint. Derivative time refers to the time interval during which a 100% change in the feedback quantity (relative to the setpoint) will cause the derivative regulator to adjust the output to the maximum frequency (P00.08) (ignoring proportional and integral actions). A longer derivative time corresponds to a stronger adjustment strength.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.08	PID Proportional gain P2	0~100	uint16	20	W	0x0808
P08.09	PID Integral time I2	0.01~10.00	uint16	2.00	W	0x0809
P08.10	PID Derivative time D2	0.0~10.0	uint16	0.0	W	0x080a

These parameters are applicable in scenarios where a single set of PID parameters cannot meet the operational requirements throughout the entire process, necessitating different PID parameter sets for varying conditions.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.11	PID Parameter switching conditions	0: No switching 1: DI terminal switching 2: Automatic switching based on deviation	uint16	0	W	0x080b
P08.12	PID Parameter switching deviation 1	0%~P08.13	uint16	20%	W	0x080c
P08.13	PID Parameter switching deviation 2	P08.12~100%	uint16	80%	W	0x080d

When "No switching" is selected, the PID parameters remain fixed as parameter group 1.

When "DI terminal switching" is selected, if the multifunctional terminal function is set to 43 (PID parameter switching terminal) and the terminal is active, parameter group 2 is used; otherwise, parameter group 1 is used.

When "Automatic switching based on deviation" is selected, if the deviation between the setpoint and feedback is less than PID parameter switching deviation 1 (P08.12), P08.05, P08.06, and P08.07 are used as PID adjustment parameters. If the deviation exceeds PID parameter switching deviation 2 (P08.13), P08.08, P08.09, and P08.10 are used as PID adjustment parameters. For deviations between switching deviation 1 and switching deviation 2, the PID parameters transition linearly between the two groups, as shown in the figure below:

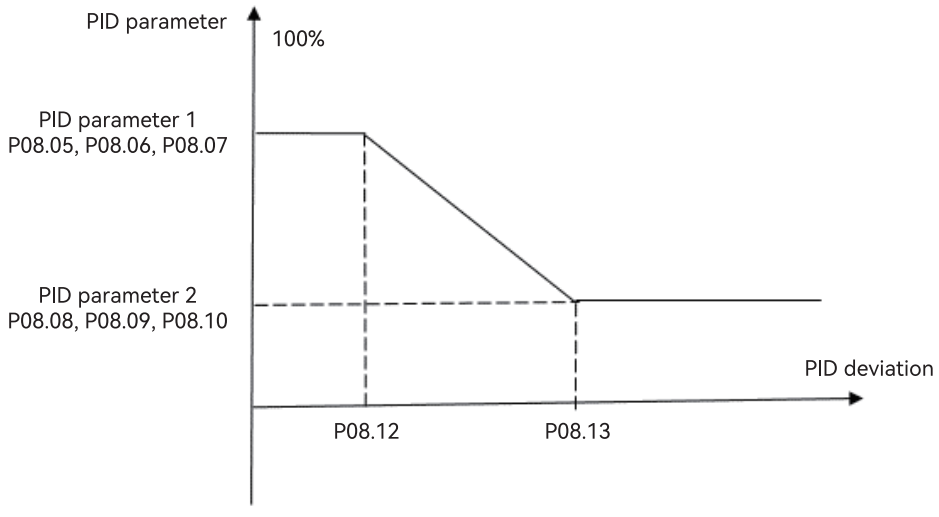


Figure 28. PID parameter switching

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.14	PID initial value	0%~100%	uint16	0%	W	0x080e
P08.15	PID initial value hold time	0.0s~650.0s	uint16	0.0s	W	0x080f

During VFD startup, the PID output is fixed at the PID initial value (P08.14) and remains so for the duration specified by the PID initial value hold time (P08.15) before the PID begins closed-loop regulation calculations. Figure 29 illustrates the functional schematic of the PID initial value.

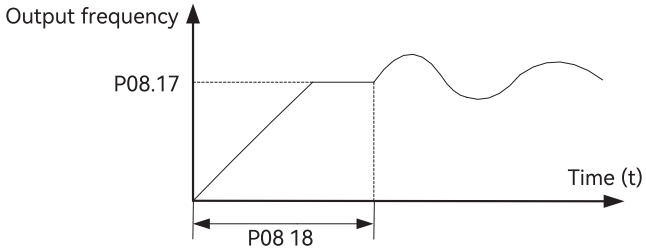


Figure 29. PID initial value function

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.16	PID feedback loss detection value	0%~100%	uint16	0%	W	0x0810
P08.17	PID feedback loss detection time	0.0s~20.0s	uint16	0.0s	W	0x0811

This function code is used to determine if the PID feedback is lost. When the PID feedback is less than the feedback loss detection value (P08.16) and the duration reaches the feedback loss detection time (P08.17), the VFD triggers a fault and operates according to the fault handling method.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.18	PID operation mode	0: No operation when stopped 1: Operation when stopped	uint16	0	W	0x0812

This parameter selects whether the PID continues to operate when the VFD is stopped. In most applications, the PID should stop operating when stopped.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.19	PID PID reverse rotation cutoff frequency	0.00Hz ~ Maximum frequency	uint16	2.00Hz	W	0x0813

In some cases, the PID can only control the setpoint and feedback quantity to the same state when the PID output frequency is negative (i.e., VFD reverse rotation). However, excessively high reverse rotation frequencies are unacceptable in certain applications. P08.19 is used to determine the upper limit of the reverse rotation frequency.

P08.19 description: When the frequency source is PID, the PID reverse rotation cutoff frequency is the current minimum PID output value. When the frequency source is main + PID, P08.19 acts on the entire main + PID system, meaning the minimum output frequency of the main + PID system is determined by P08.19.

Frequency source as PID:

Output upper/lower limits and range (e.g., frequency source is PID or main + PID):

1) Reverse rotation cutoff frequency is 0 or reverse rotation is inhibited (i.e., any of the following three conditions):

(1) P08.19 = 0, P01.21 = 0;

(2) P08.19 = 0, P01.21 = 1;

(3) P08.19 != 0, P01.21 = 1

Output upper limit: Upper frequency

Output lower limit: Lower frequency

Output range: Lower frequency ~ Upper frequency (i.e., P00.11 ~ P00.10)

2) Reverse rotation cutoff frequency is non-zero and reverse rotation is not inhibited (i.e., P08.19 ≠ 0, P01.21 = 0):

Output upper limit: Upper frequency

Output lower limit: -Reverse rotation cutoff frequency

Output Range: -Reverse rotation cutoff frequency ~ Upper frequency

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.20	PID deviation limit	0%~100%	uint16	0%	W	0x0814

When the deviation between the PID setpoint and feedback quantity is less than P08.20, the PID stops adjusting. This stabilizes the output frequency when the setpoint-feedback deviation is small, which is effective for certain closed-loop control scenarios.

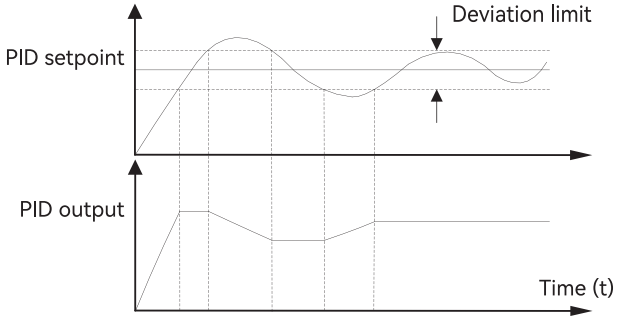


Figure 30. PID deviation limit

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.21	PID derivative amplitude limiting	0%~100%	uint16	0.1%	W	0x0815

The derivative action in the PID regulator is highly sensitive and can easily cause system oscillation. Thus, the derivative effect is generally limited to a small range. P08.21 is used to set the range of the PID derivative output.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.22	PID setpoint change time	0.0s~650.0s	uint16	0.0s	W	0x0816

PID setpoint change time refers to the time required for the PID setpoint to change from 0.0% to 100.0%. When the PID setpoint changes, the setpoint value changes linearly over the time specified by P08.22, reducing the adverse effects of sudden setpoint changes on the system.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.23	PID feedback filtering time	0s~60.0s	uint16	0.0s	W	0x0817
P08.24	PID output filtering time	0s~60.0s	uint16	0.0s	W	0x0818

P08.23 is used to filter the PID feedback quantity, which helps reduce the impact of interference on the feedback but may degrade the response performance of the closed-loop system.

P08.24 is used to filter the PID output frequency, weakening sudden changes in the VFD output frequency but similarly

potentially degrading the response performance of the closed-loop system.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.26	Maximum deviation between two PID outputs	0%~100%	uint16	1%	W	0x081a
P08.27	Minimum deviation between two PID outputs	0%~100%	uint16	1%	W	0x081b

This function code limits the difference between PID outputs in consecutive control cycles (2ms per cycle) to suppress excessively rapid changes in PID output.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.28	PID integral attributes	Units digit: 0: Inhibit integral pause 1: Allow integral pause Tens digit: 0: Continue integral operation when integral output reaches a limit 1: Stop integral operation when integral output reaches a limit	uint16	0	W	0x081c

If the units digit is set to 1, the PID integral stops operating when the multifunctional digital DI integral pause (Function 22) is active, leaving only proportional and derivative actions effective. If the units digit is set to 0, integral pause is prohibited regardless of the effectiveness of the multifunctional digital DI.

After the PID operation output reaches its maximum or minimum value, the integral operation can be optionally stopped. Stopping the integral operation may help reduce PID overshoot.

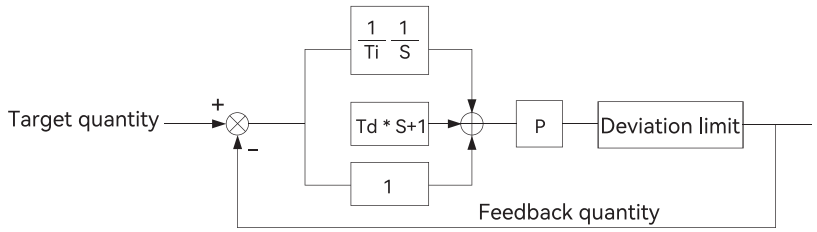


Figure 31. Process PID principle

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P08.29	PID type	0: Incremental PID 1: Positional PID	uint16	0	W	0x081d

4.10 P09 Special function control parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.00	Frequency detection value (FDT level)	0.00Hz~P00.08	uint16	50.00Hz	W	0x0900
P09.01	Frequency detection hysteresis value	0%~100%	uint16	5%	W	0x0901

After selecting the frequency level FDT1 output function for the DO output function, when the operating frequency is higher than the frequency detection value, the VFD's multifunctional output DO sends an ON signal. When the frequency drops below the set detection value, the DO ON signal is canceled.

These parameters are used to set the detection value of the output frequency and the hysteresis value for releasing the output action. Among them, P09.01 represents the percentage of the hysteresis frequency relative to the frequency detection value P09.00. The figure below illustrates the schematic of the FDT1 function.

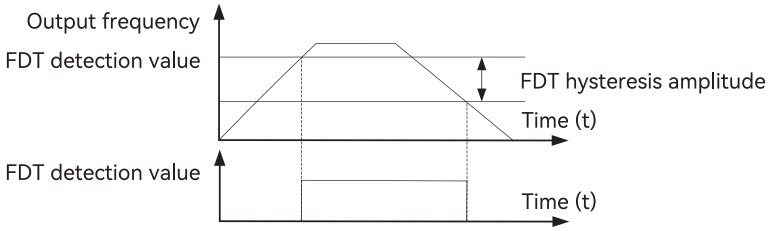


Figure 32. Frequency arrival detection amplitude

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.02	Frequency detection value (FDT1 level)	0.00Hz~P00.08	uint16	50.00Hz	W	0x0902
P09.03	Frequency detection 1 hysteresis value	0%~100%	uint16	5%	W	0x0903

This frequency detection function is identical to the FDT1 function. For details, refer to the descriptions of FDT1 (i.e., function codes P09.00 and P09.01).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.04	Frequency arrival detection amplitude	0%~100%	uint16	0%	W	0x0904

When the VFD's operating frequency is within a certain range of the target frequency, the multifunctional DO outputs an ON signal.

This parameter sets the detection range for frequency arrival, which is a percentage of the maximum frequency. The figure below illustrates the frequency arrival detection.

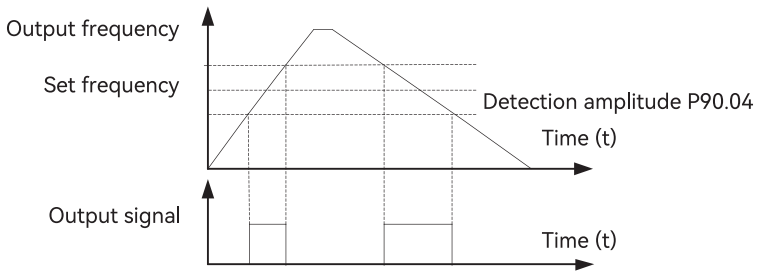


Figure 33. Frequency arrival detection amplitude

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.05	Swing frequency setting method	0: Relative to center frequency 1: Relative to maximum frequency	uint16	0	W	0x0905

This parameter determines the reference quantity for the swing amplitude.

0: Relative to the center frequency (frequency source superposition selection P00.05), forming a variable swing amplitude system. The swing amplitude changes with the center frequency (set frequency).

1: Relative to the maximum frequency (P00.08), forming a fixed swing amplitude system with a constant swing amplitude.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.06	Swing amplitude	0%~100%	uint16	0%	W	0x0906
P09.07	Jump frequency amplitude	0%~50%	uint16	0%	W	0x0907

These parameters are used to determine the swing amplitude value and the jump frequency value.

When the swing amplitude is set relative to the center frequency (P09.05=0), the swing amplitude AW = Set frequency P28.05 × Swing amplitude P09.06.

The jump frequency amplitude is the frequency percentage of the jump frequency relative to the swing amplitude during swing frequency operation, i.e., Jump frequency = Swing amplitude AW × Jump frequency amplitude P09.07. If the swing amplitude is set relative to the center frequency (P09.05=0), the jump frequency is a variable value. If set relative to the maximum frequency (P09.05=1), the jump frequency is a fixed value.

The swing frequency operating frequency is constrained by the upper frequency and lower frequency limits.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.08	Swing period	0.1S~3000.0S	uint16	10.0S	W	0x0908
P09.09	Triangular wave rise time coefficient	0.0%~100%	uint16	50%	W	0x0909

Swing period: The time value of a complete swing frequency cycle.

Triangular wave rise time coefficient P09.09: The time percentage of the triangular wave rise time relative to the swing period P09.08.

Triangular wave rise time = Swing period P09.08 × Triangular wave rise time coefficient P09.09 (unit: s)

Triangular wave fall time = Swing period P09.08 × (1 - Triangular wave rise time coefficient P09.09) (unit: s)

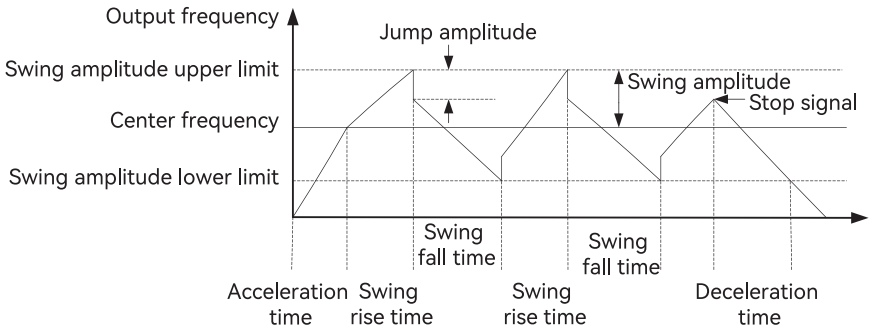


Figure 34. Swing frequency operation principle

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.10	Set length	0m~65535m	uint16	1000m	W	0x090a
P09.11	Actual length	0m~65535m	uint16	0m	W	0x090b
P09.12	Pulses per meter (PPM)	0~6553.5	uint16	100	W	0x090c

These function codes are used for fixed-length control.

Length information needs to be collected via a multifunctional digital input terminal. The actual length P09.11 is calculated by dividing the number of pulses sampled by the terminal by the PPM P09.12. When the actual length exceeds the set length

P09.10, the multifunctional digital DO outputs an "Length reached" ON signal.

During fixed-length control, length reset operations can be performed via a multifunctional DI terminal (DI function set to 28; refer to P5.00~P5.05 for details). In applications, the corresponding input terminal function must be set to "Length counting input" (Function 27). When the pulse frequency is high, DI1 or the HDI port must be used.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.13	Set count value	0~65535	uint16	1000	W	0x090d
P09.14	Specified count value	0~65535	uint16	1000	W	0x090e

The count value needs to be collected via a multifunctional digital input terminal. In applications, the corresponding input terminal function must be set to "Counter input" (Function 25). When the pulse frequency is high, DI1 or the HDI port must be used.

When the count value reaches the set count value P09.13, the multifunctional digital DO outputs a "Set count value reached" ON signal, and the counter stops counting thereafter.

When the count value reaches the specified count value P09.14, the multifunctional DO outputs an "Specified count value reached" ON signal. At this point, the counter continues to count until it stops when reaching the "Set count value."

The specified count value P09.14 should not exceed the set count value P09.13. Figure 32 illustrates the schematic diagram of the set count value reached and the specified count value reached functions.

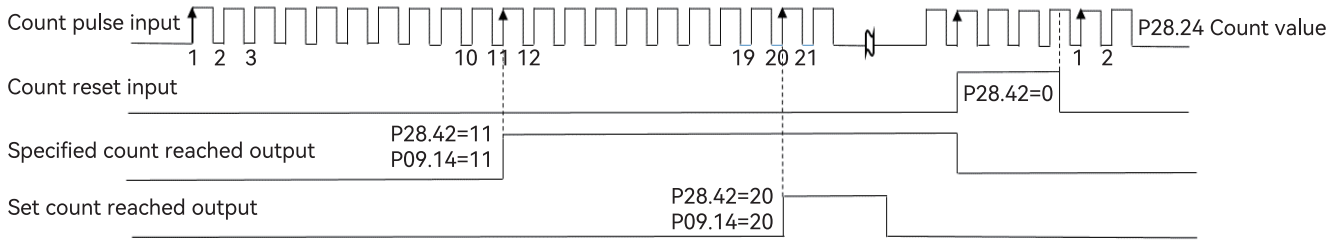


Figure 35. Set count value reached and specified count value reached

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.15	Droop control	0.00~10.00Hz	uint16	0.00Hz	W	0x090f

The droop rate allows a small speed difference between the master station and slave station, thereby avoiding conflicts between them. The default value of this parameter is 0.

The droop rate only needs adjustment when both the master and slave adopt speed control mode. For each drive process, an appropriate droop rate must be determined through practical testing. It is recommended not to set P09.15 too high, as excessive droop may cause a significant drop in steady-state speed under heavy loads. Both the master and slave must have the droop rate configured.

Droop speed = Synchronous frequency × Output torque × Droop rate ÷ 10

Example: If P09.15 = 1.00, synchronous frequency = 50Hz, and output torque = 50%, then:

Droop speed = 50Hz × 50% × 1.00 ÷ 10 = 2.5Hz

Actual VFD frequency = 50Hz − 2.5Hz = 47.5Hz

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.16	Set operation reach time	0h~65000h	uint16	0h	W	0x0910

It is used to set the operation time of the VFD.

When the cumulative operation time (P10.07) reaches this set operation time, the multifunctional digital DO outputs an ON signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.17	Set power-on reach time	0h~65000h	uint16	0h	W	0x0911

It presets the power-on time of the VFD. When the cumulative power-on time (P10.11) reaches this set power-on time, the multifunctional digital DO outputs an operation time reached signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.20	Acceleration time 1/2 switching frequency point	0.00Hz~P00.08	uint16	0.00Hz	W	0x0914
P09.21	Deceleration time 1/2 switching frequency point	0.00Hz~P00.08	uint16	0.00Hz	W	0x0915

This function is active when the motor is selected as Motor 1 and the acceleration/deceleration time is not switched via a DI terminal. It allows the VFD to automatically select different acceleration/deceleration times based on the operating frequency range during operation, without relying on DI terminals.

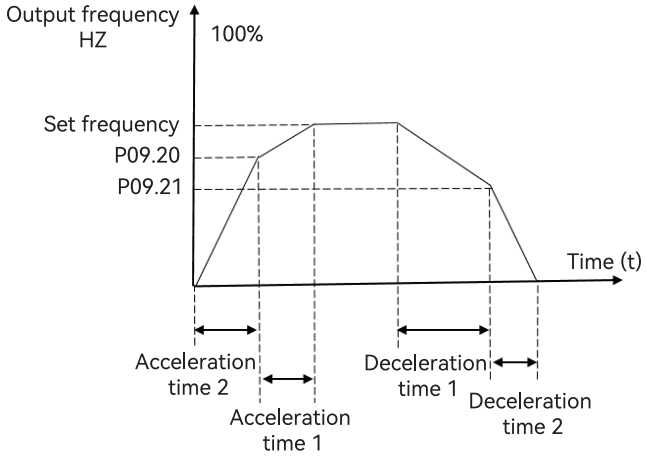


Figure 36. Acceleration/Deceleration time switching

During acceleration: If the operating frequency is less than P9.20, select acceleration time 2; if greater than P9.20, select acceleration time 1.

During deceleration: If the operating frequency is greater than P9.21, select deceleration time 1; if less than P9.21, select deceleration time 2.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.22	Frequency arrival detection value 1	0.00Hz~P00.08	uint16	50.00Hz	W	0x0916
P09.23	Frequency arrival detection 1 amplitude	0%~100%	uint16	0%	W	0x0917
P09.24	Frequency arrival detection value 2	0.00Hz~P00.08	uint16	50.00Hz	W	0x0918
P09.25	Frequency arrival detection 2 amplitude	0%~100%	uint16	0%	W	0x0919

When the VFD's output frequency falls within the positive/negative detection amplitude range of any arrival frequency detection value, the multifunctional DO outputs an ON signal.

E630 provides two sets of arbitrary arrival frequency detection parameters, which are used to set the frequency value and frequency detection range respectively. Figure 34 illustrates the schematic diagram of this function.

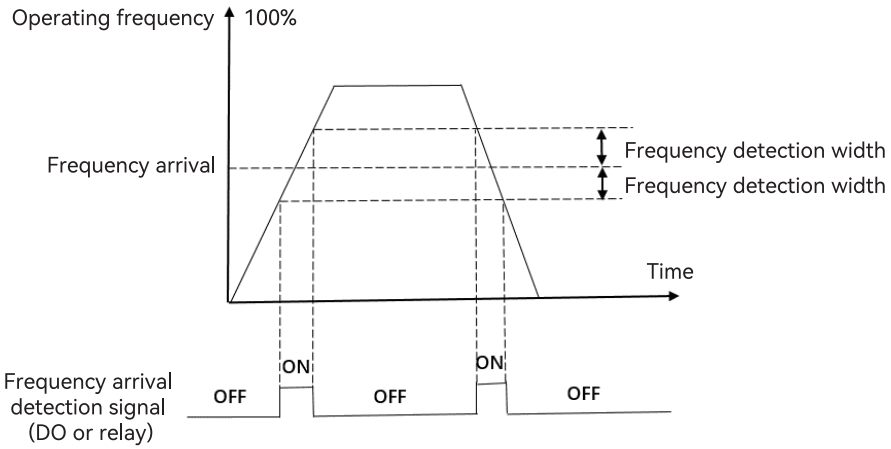


Figure 37. Frequency arrival detection

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.26	Timer function selection	0: Inactive 1: Active	uint16	0	W*	0x091a
P09.27	Timer time setting selection	0: Set timer operation time (P09.28) 1: AI1 2: AI2	uint16	0	W*	0x091b
P09.28	Set operation time	0Min~6500Min	uint16	0Min	W*	0x091c

This parameter group is used to implement the VFD's timer operation function.

When the timer function selection (P09.26) is active, the VFD starts timing upon startup. After reaching the set timer operation time, the VFD automatically stops, and the multifunctional DO outputs an ON signal.

Each time the VFD starts, timing begins from 0. The remaining timer operation time can be viewed via P28.47. The timer operation time is set by P09.27 and P09.28, with the time unit in minutes. When P09.27 selects analog input, 100% of the analog input range corresponds to the set time in P09.28.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.29	Wake-up frequency	P09.31~P00.08	uint16	0.00Hz	W	0x091d
P09.30	Wake-up delay time	0.0s~6500.0s	uint16	0.0s	W	0x091e
P09.31	Sleep frequency	0.00Hz~P00.08	uint16	0.00Hz	W	0x091f
P09.32	Sleep delay time	0.0s~6500.0s	uint16	0.0s	W	0x0920

This parameter group is used to implement sleep and wake-up functions in water supply applications.

During VFD operation, when the set frequency is less than or equal to the sleep frequency (P09.31), after a delay time (P09.32), the VFD enters sleep mode and automatically stops.

If the VFD is in sleep mode and the current operation command is active, when the set frequency is greater than or equal to the wake-up frequency (P09.29), after a delay time (P09.30), the VFD starts up.

Under normal circumstances, set the wake-up frequency to be greater than or equal to the sleep frequency. If both the set wake-up frequency and sleep frequency are 0.00Hz, the sleep and wake-up functions are inactive.

When the sleep function is enabled and the frequency source uses PID, whether the PID operates in sleep mode is affected by function code P08.18. In this case, PID operation when stopped (P08.18=1) must be selected.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P09.33	Current operation reach time	0~6500Min	uint16	0Min	W*	0x0921

When the operation time of the current startup reaches this time, the multifunctional digital DO outputs an "Operation time reached" ON signal.

4.11 P10 Keypad and display parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.01	STOP/RESET key function	0: Only active under keypad control 1: Active for all control modes	uint16	1	W	0x0a01

Configure whether the STOP key function is active.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.02	MF.K key function selection	0: MF.K key inactive 1: Switch between operator panel commands and remote commands 2: Forward/reverse rotation switching 3: Forward jog 4: Reverse jog 5: Exit parameter interface	uint16	5	W*	0x0a02

The MF.K key is multifunctional. Its function can be configured via this parameter. This key can be used for switching in both stopped and running states.

0: No function assigned to this key

1: Switch between keypad commands and remote operation

Switch between the current command source and local keypad control. If the current command source is keypad control, this key function is inactive.

2: Forward/Reverse rotation switching

Switch the direction of the frequency command via the MF.K key. This function is only active when the command source is the operator panel command channel.

3: Forward jog

Implement forward jog (FJOG) via the MF.K key on the keypad.

4: Reverse jog

Implement reverse jog (RJOG) via the MF.K key on the keypad.

5: Exit parameter interface via the MF.K key on the keypad.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.03	LED operation display parameter 1	Bit 0: Operating frequency Bit 1: Bus voltage Bit 2: Output voltage Bit 3: Output current Bit 4: Output power Bit 5: Output torque Bit 6: Feedback frequency Bit 7: Detection frequency Bit 8: DI input status Bit 9: DO output status Bit 10: Radiator temperature Bit 11: Output torque Bit 12: Motor temperature Bit 13: AI1 voltage Bit 14: AI2 voltage Bit 15: Speed	uint16	0	W	0x0a03
P10.04	LED operation display parameter 2	Bit 0: Pulse input frequency (unit: 0.01kHz) Bit 1: Pulse input frequency (unit: 1kHz) Bit 2: Communication set value Bit 3: Main frequency display Bit 4: Auxiliary frequency Y display Bit 5: Current power-on time Bit 6: Current operation time Bit 7: Remaining operation time Bit 8: Linear speed Bit 9: Count value input Bit 10: Length value input Bit 11: Load speed Bit 12: PID set value Bit 13: PID feedback value Bit 14: PLC stage Bit 15: Fault information	uint16	0	W	0x0a04

Operation display parameters are used to configure the parameters visible when the VFD is in operation.

Up to 32 status parameters can be viewed. The specific parameters to display are selected based on the binary bits of parameters P10.03 and P10.04, with the display order starting from the least significant bit of P10.03. During operation, set the corresponding bit of the parameter to be displayed to 1, convert the final binary number to hexadecimal, and input it into P10.03 and P10.04. For example, if the running frequency, DI output status, current power-on time, and fault information need to be displayed during operation, set P10.03 = H.0101 and P10.04 = H.8020.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.05	LED display parameters when stopped	Bit 0: Set frequency Bit 1: Bus voltage Bit 2: DI input status Bit 3: DO input status Bit 4: AI1 voltage Bit 5: AI2 voltage Bit 6: Reserved Bit 7: Count value Bit 8: Length value Bit 9: PLC stage Bit 10: Load speed display Bit 11: PID set value Bit 12: Pulse input Bit 13: Radiator temperature Bit 14: Motor temperature value Bit 15: Fault information	uint16	0	W	0x0a05

It is used to set the parameters that can be viewed when the VFD is in a stopped state. Up to 16 status parameters can be viewed. The specific parameters to display are selected based on the binary bits of the P10.05 parameter value, with the display order starting from the least significant bit (LSB) of P10.05. During stopping, set the corresponding bit of the parameter to be displayed to 1, convert the final binary number to hexadecimal, and input it into P10.05. For example, if the set frequency and fault information need to be displayed during stopping, set P10.05 to hexadecimal H.8001.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.06	Load speed display coefficient	0.0001~6.5	uint16	1	W	0x0a06

When load speed display is required, this parameter adjusts the correspondence between the VFD's output frequency and the load speed. For specific correspondence, refer to the description of P10.10.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.07	Cumulative operation time	0h~65535h	uint16	0h	R	0x0a07

It displays the cumulative operation time of the VFD. When the operation time reaches the set operation time P9.16, the multifunctional digital output function (12) of the VFD outputs an ON signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.08	Non-Standard function version number	0~655.35	uint16	Model setting	R	0x0a08
P10.09	Software function version number	0~655.35	uint16	Model setting	R	0x0a09

P10.08 displays the special machine number of the display function and the sub-version number of the function software.

P10.09 displays the function software version number.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.10	Load speed display decimal places	0: 0 decimal places 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	uint16	Model setting	W	0x0a0a

Units digit: Used to set the number of decimal places for load speed display. Below is an example of load speed calculation:

If the load speed display coefficient P10.06 is 2.000, and the load speed decimal places P10.10 is 2 (2 decimal places), when the VFD operating frequency is 40.00Hz, the load speed is: 40.00 × 2.000 = 80.00 (displayed with 2 decimal places).

If the VFD is in stopped state, the load speed displays the speed corresponding to the set frequency, i.e., "set load speed." For example, with a set frequency of 50.00Hz, the stopped state load speed is: 50.00 × 2.000 = 100.00 (displayed with 2 decimal places).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.11	Cumulative power-on time	0h~65535h	uint16	Model setting	R	0x0a0b

It displays the cumulative power-on time of the VFD since leaving the factory. When this time reaches the set power-on time (P9.17), the multifunctional digital output function (24) of the VFD outputs an ON signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P10.12	Cumulative power consumption	0~65535	uint16	0	R	0x0a0c
P10.13	Panel up/down key jog switching	0: Panel up/down keys modify frequency or parameters 1: When the panel is in the 0 menu interface, press the UP key to jog forward and the DOWN key to jog reverse	uint16	0	W	0x0a0d
P10.14	Non-Standard performance version number	0~655.35	uint16	0	R	0x0a0e
P10.15	External keypad type selection	0: Select connection to HDv-KC2-CS0 keypad 1: Select connection to HDv-KC1-BS0 keypad 2: Select connection to HDv-KC1-AS0 keypad	uint16	0	W	0x0a0f

4.12 P11 Multi-speed command parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P11.00	Multi-segment command 0 input method	0: Numerical input (P11.01) 1: AI1 input 2: AI2 input 4: PULSE input 5: PID input 6: Preset frequency input (P00.12)	uint16	0	W	0x0b00

This parameter determines the input channel for multi-segment command 0.

In addition to selecting P11.01, multi-segment command 0 offers multiple other options, facilitating switching between multi-segment commands and other given methods. Whether multi-segment commands serve as the frequency source or a simple PLC acts as the frequency source, easy switching between the two frequency sources can be achieved.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P11.01	Multi-segment command 0	-100%~100%	uint16	5%	W	0x0b01
P11.02	Multi-segment command 1	-100%~100%	uint16	30%	W	0x0b02
P11.03	Multi-segment command 2	-100%~100%	uint16	50%	W	0x0b03
P11.04	Multi-segment command 3	-100%~100%	uint16	80%	W	0x0b04
P11.05	Multi-segment command 4	-100%~100%	uint16	100%	W	0x0b05
P11.06	Multi-segment command 5	-100%~100%	uint16	0%	W	0x0b06
P11.07	Multi-segment command 6	-100%~100%	uint16	0%	W	0x0b07
P11.08	Multi-segment command 7	-100%~100%	uint16	0%	W	0x0b08
P11.09	Multi-segment command 8	-100%~100%	uint16	0%	W	0x0b09
P11.10	Multi-segment command 9	-100%~100%	uint16	0%	W	0x0b0a
P11.11	Multi-segment command 10	-100%~100%	uint16	0%	W	0x0b0b
P11.12	Multi-segment command 11	-100%~100%	uint16	0%	W	0x0b0c
P11.13	Multi-segment command 12	-100%~100%	uint16	0%	W	0x0b0d
P11.14	Multi-segment command 13	-100%~100%	uint16	0%	W	0x0b0e
P11.15	Multi-segment command 14	-100%~100%	uint16	0%	W	0x0b0f
P11.16	Multi-segment command 15	-100%~100%	uint16	0%	W	0x0b10

Multi-segment commands can be used in three scenarios: as a frequency source, as a voltage source for voltage-frequency (VF) separation, or as a setpoint source for process PID.

In all three application scenarios, the dimension of the multi-segment command is a relative value ranging from -100.0% to 100.0%. When serving as a frequency source, it represents the percentage of the maximum relative frequency; when acting as a VF separation voltage source, it represents the percentage of the motor's rated voltage; and since PID setpoints are inherently relative values, no dimension conversion is required when multi-segment commands serve as PID setpoint sources.

Switching selection for multi-segment commands is performed based on the different states of the multifunctional digital DI. For specific details, refer to the relevant description of parameter group P05.

4.13 P12 Simple PLC parameter croup

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P12.00	PLC operation modes	0: Stop after a single operation completes 1: Maintain the final value after a single operation completes 2: Continuous cycling	uint16	0	W	0x0c00

When serving as a frequency source, the PLC has three operation modes; it does not support these three modes when acting as a voltage-frequency separated voltage source. Details are as follows:

0: Stop after a single operation completes

After the VFD completes a single cycle, it automatically stops. A new operation command is required for the next startup.

1: Maintain the final value after a single operation completes

After completing one single cycle, the VFD automatically maintains the operating frequency and direction of the last

segment.

2: Continuous cycling

After completing one cycle, the VFD automatically starts the next cycle and continues until a stop command is issued.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P12.01	PLC power loss memory selection	Units digit: Power loss memory selection 0: Non-retentive during power loss 1: Retentive during power loss Tens digit: Stopped memory selection 0: Non-retentive during stopping 1: Retentive during stopping	uint16	0	W	0x0c01

PLC retentive during power loss refers to storing the PLC's operating stage and operating frequency before power loss, allowing resumption from the stored stage upon subsequent power-up. If "non-retentive" is selected, the PLC process restarts every time power is applied.

PLC stopped memory refers to recording the PLC's operating stage and operating frequency at the time of stopping, enabling resumption from the stored stage during the next operation. If "non-retentive" is selected, the PLC process restarts every time it is started.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P12.02	PLC operation time unit	0: Second 1: Hour	uint16	0	W	0x0c01

Select the time unit for each PLC stage's operation time.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P12.03	PLC segment 0 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c03
P12.04	PLC segment 0 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c04
P12.05	PLC segment 1 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c05
P12.06	PLC segment 1 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c06
P12.07	PLC segment 2 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c07
P12.08	PLC segment 2 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c08
P12.09	PLC segment 3 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c09
P12.10	PLC segment 3 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c0a
P12.11	PLC segment 4 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c0b
P12.12	PLC segment 4 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c0c
P12.13	PLC segment 5 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c0d
P12.14	PLC segment 5 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c0e
P12.15	PLC segment 6 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c0f
P12.16	PLC segment 6 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c10
P12.17	PLC segment 7 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c11

P12.18	PLC segment 7 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c12
P12.19	PLC segment 8 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c13
P12.20	PLC segment 8 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c14
P12.21	PLC segment 9 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c15
P12.22	PLC segment 9 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c16
P12.23	PLC segment 10 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c17
P12.24	PLC segment 10 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c18
P12.25	PLC segment 11 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c19
P12.26	PLC segment 11 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c1a
P12.27	PLC segment 12 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c1b
P12.28	PLC segment 12 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c1c
P12.29	PLC segment 13 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c1d
P12.30	PLC segment 13 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c1e
P12.31	PLC segment 14 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c1f
P12.32	PLC segment 14 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c20
P12.33	PLC segment 15 operation time	0s(h)~6500s(h)	uint16	0	W	0x0c21
P12.34	PLC segment 15 acceleration/ deceleration time selection	0~3	uint16	0	W	0x0c22

The simple PLC function has two roles: serving as a frequency source or as a voltage-frequency separated voltage source.

Figure 38 is a schematic diagram of the simple PLC when acting as a frequency source. When serving as a frequency source, the positive/negative values of P11.01 to P11.16 determine the operation direction; negative values indicate reverse operation of the VFD.

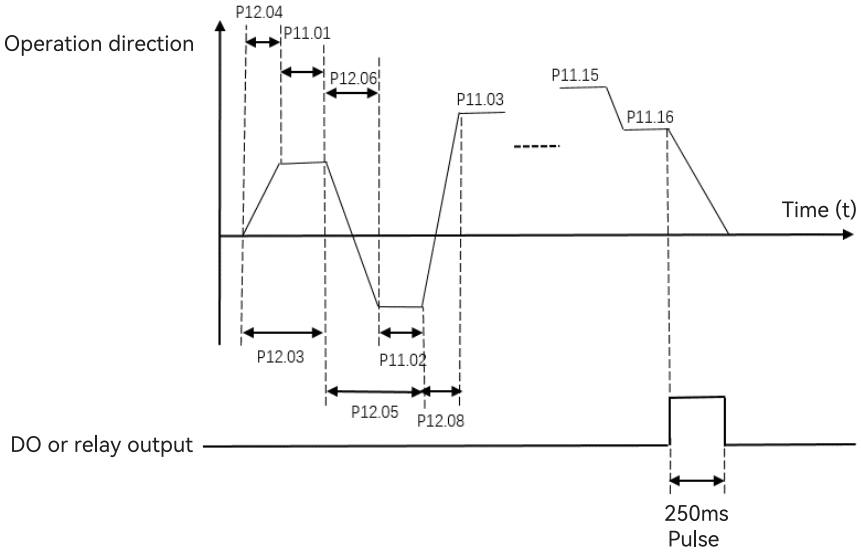


Figure 38. Simple PLC diagram

4.14 P13 Fault and protection setting parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.01	Motor overload software protection selection	0: Disabled 1: Enabled	uint16	1	W	0x0d01

0: The VFD does not provide overload protection for the load motor; a thermal relay should be installed before the motor in this case.

1: The VFD provides overload protection for the motor. For protection values, refer to P13.02.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.02	Motor overload software protection gain	0.20~10.00	uint16	1.00	W	0x0d02

To effectively protect different load motors, the motor overload protection gain must be set based on the motor's overload capability. Motor overload protection follows an inverse-time curve, as shown in the figure below.

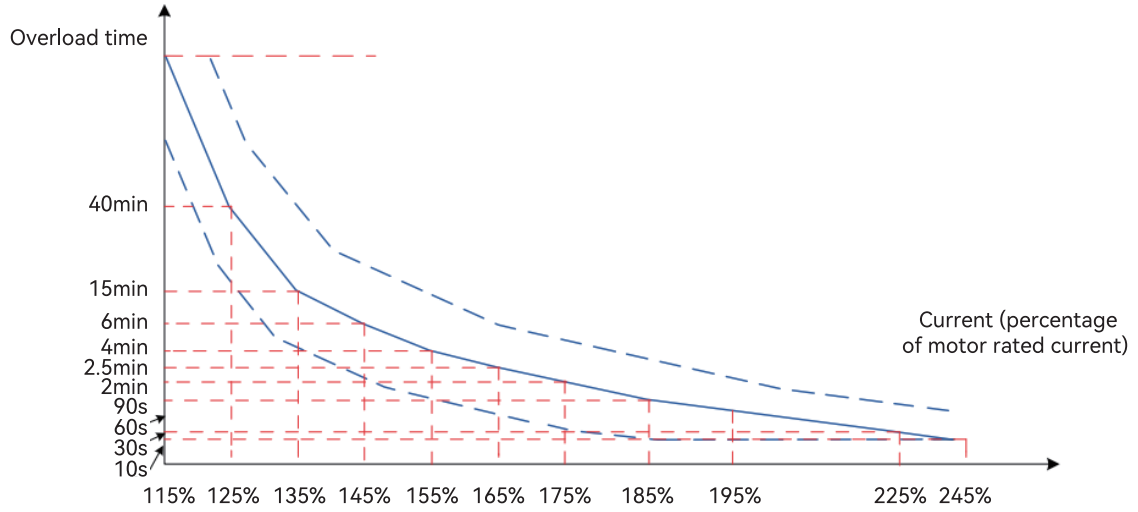


Figure 39. Protection inverse-time curve

Under the condition that the motor's operating current reaches 175% of the motor's rated current, the VFD will report a motor overload fault (Err11) after continuous operation for 2 minutes. When the motor's operating current reaches 115% of the motor's rated current, the VFD will report a motor overload fault (Err11) after continuous operation for 80 minutes.

- If the motor's rated current is 100A and P13.02 is set to 1.00, according to the curve, when the motor's operating current reaches 125% of 100A (125A), the VFD will report a "motor overload fault (Err11)" after continuous operation for 40 minutes.
- If P13.02 is set to 1.20, when the motor's operating current reaches 125A (125% of 100A), the VFD will report a "motor overload fault (Err11)" after continuous operation for 40 × 1.2 = 48 minutes.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.03	Motor overload pre-alarm coefficient	50%~100%	uint16	80%	W	0x0d03

The motor overload pre-alarm coefficient indicates: When the motor overload detection level reaches the value set by this parameter, the multifunctional output terminal (DO or relay) will output a "motor overload pre-alarm signal." This parameter is calculated based on the time percentage during which the motor can operate continuously at a specific overload point without triggering an overload fault.

When the VFD detects that the output current reaches P13.03 × motor overload current and continues for the time specified by the inverse-time curve, a pre-alarm signal will be output via the DO or relay.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.04	Input phase loss protection selection	0: Disabled 1: Enabled Units digit: Input phase loss protection Tens digit: Reserved	uint16	11	W	0x0d04

Select whether to enable protection for output phase loss.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.05	Load shedding protection selection	0: Inactive 1: Active	uint16	0	W	0x0d05
P13.06	Load shedding detection level	0%~100%	uint16	10%	W	0x0d06
P13.07	Load shedding detection time	0s~60s	uint16	1s	W	0x0d07

After load shedding, the VFD defaults to coast stop. If this function is active, when the VFD sheds load, its output frequency will be 7% of the rated frequency; if the load is restored, the VFD will resume operation at the set frequency. The load shedding detection level and time can be configured.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.08	Output phase loss protection selection	0: Disabled 1: Enabled	uint16	1	W	0x0d08

Select whether to enable protection for output phase loss.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.09	Power-on ground short-circuit protection selection	0: Inactive 1: Active	uint16	1	W	0x0d09

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.10	Brake unit start action voltage	330v~800v	uint16	Model setting	W	0x0d0a

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.11	Motor temperature sensor type	0: AI3 1: PT100 2: PT1000 3: KTY84-130 4: PTC130	uint16	0	W	0x0d0b

Analog input AI3 can be used as the input for the motor temperature sensor, supporting four types of motor temperature sensors: PT100, PT1000, and KTY. The sensor signal is connected to AI3 and GND terminals. When using, the sensor type must be correctly set, and the motor temperature is displayed in P28.20. (Set to 0, AI3 defaults to voltage acquisition mode.)

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.12	Motor overheat protection threshold	0℃ ~200℃	uint16	110℃	W	0x0d0c

Motor overheat protection threshold. When the motor temperature exceeds P13.12 (motor overheat protection threshold), the VFD reports a motor overheat fault (E45) and performs corresponding processing according to the handling method set in P13.45 (fault protection action selection).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.13	Motor overheat pre-alarm threshold	0℃ ~200℃	uint16	90℃	W	0x0d0d

Motor overheat pre-alarm threshold. When the motor temperature exceeds P13.13 (motor overheat pre-alarm threshold) and the function selection of the DO output terminal is set to 39 (motor overtemperature), the DO terminal outputs an active signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.15	Initial position fault enable	0~11	uint16	11	W	0x0d0f
P13.16	Encoder wire break detection enable	0~1	uint16	1	W	0x0d10

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.17	Cooling fan control	0: Fan runs during VFD operation 1: Fan runs when VFD is powered on 2: Fan operation determined by temperature	uint16	0	W*	0x0d11

Fan operation control modes:

0: Fan runs when the VFD is operating; fan stops when the VFD stops.

1: Fan runs immediately when the VFD is powered on; fan stops when the VFD loses power.

2: Fan runs when the VFD temperature is ≥ P13.46 (fan start temperature); fan stops when the VFD temperature is < P13.46 – 5° C.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.18	Overvoltage point setting	330~890	uint16	Model setting	W*	0x0d12

When the bus voltage exceeds the set value of P13.18, the VFD reports a fault (Err05~Err07).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.19	Undervoltage point setting	140~420	uint16	Model setting	W	0x0d13

When the bus voltage is below the set value of P13.19, the VFD reports a fault (Err09).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.20	Number of automatic fault resets	0~20	uint16	0	W	0x0d14

It sets the number of times the VFD can automatically reset when a fault occurs. If the number of resets exceeds the set value, the VFD remains in the fault state.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.21	Fault DO action selection during automatic fault reset	0: No action 1: Action	uint16	0	W	0x0d15

This parameter sets whether the fault DO (digital output) will operate during the VFD's fault reset period.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.22	Automatic fault reset interval time	0.1~100	uint16	1	W	0x0d16

The waiting time interval from the fault alarm to the fault reset.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.28	Frequency selection for continued operation during fault	0: Operate at the current operating frequency 1: Operate at the set frequency 2: Operate at the upper limit frequency 3: Operate at the lower limit frequency 4: Operate at the abnormal standby frequency	uint16	0	W	0x0d1c
P13.29	Abnormal standby frequency setting	0%~100%	uint16	100%	W	0x0d1d

If a fault occurs during VFD operation and the fault protection is configured to continue operation, the VFD will display "A**" and operate at the frequency set by P13.28.

When the abnormal standby frequency is selected for operation, the value of P13.29 is a percentage of the maximum frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.30	Zero current detection level	0%~300%	uint16	5%	W	0x0d1e
P13.31	Zero current detection delay time	0.0s~600.0s	uint16	0.1s	W	0x0d1f

When the VFD's output current is less than or equal to the zero current detection level and lasts longer than the zero current detection delay time, the multifunctional DO of the VFD outputs an ON signal.

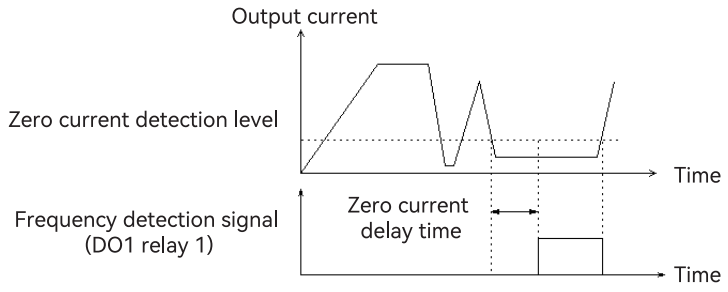


Figure 40. Zero current detection

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.34	Arbitrary arrival current 1	0%~300%	uint16	100%	W	0x0d22

P13.35	Arbitrary arrival current 1 width	0%~300%	uint16	0%	W	0x0d23
P13.36	Arbitrary arrival current 2	0%~300%	uint16	100%	W	0x0d24
P13.37	Arbitrary arrival current 2 width	0%~300%	uint16	0%	W	0x0d25

When the VFD's output current falls within the set positive/negative detection width of the arbitrary arrival current, the multifunctional DO of the VFD outputs an ON signal.

E630 provides two sets of arbitrary arrival current and detection width parameters. The figure below shows the functional schematic diagram.

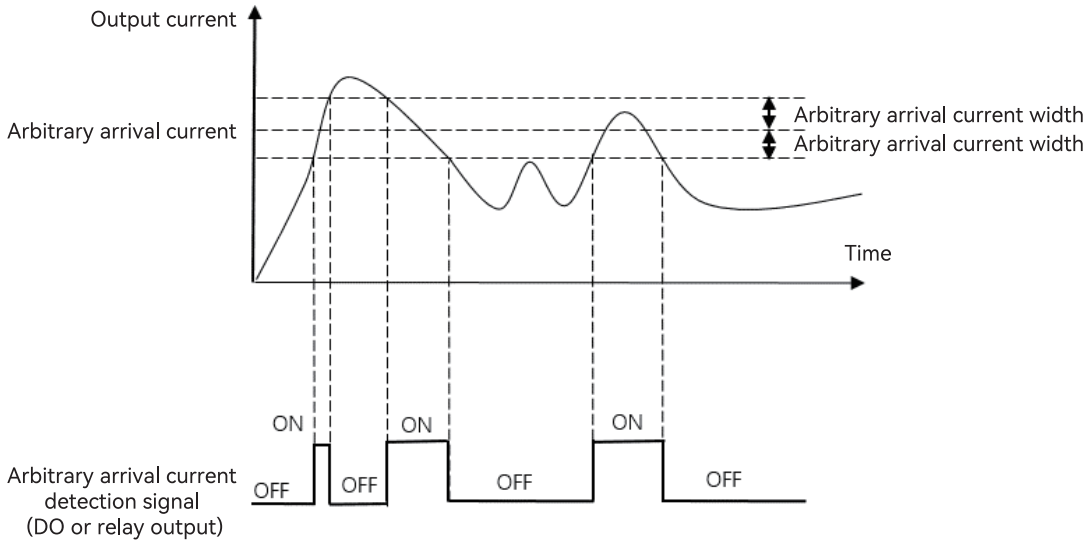


Figure 41. Arbitrary arrival frequency detection

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.38	AI1 input voltage protection lower limit	0v~10v	uint16	3.1v	W	0x0d26
P13.39	AI1 input voltage protection upper limit	0v~11v	uint16	6.8v	W	0x0d27

When the value of the analog input AI1 is greater than P13.39 or less than P13.38, the multifunctional DO of the VFD outputs an ON signal for "AI1 input out of range" to indicate whether the input voltage of AI1 is within the set range.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.40	Module temperature reached	0~10℃	uint16	75℃	W	0x0d28

When the VFD radiator temperature reaches the set value of P13.40, the DO terminal outputs an active signal.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.41	Fault protection action selection 1	Units digit: Motor overload (Err11) 0: Continue running 1: Stop according to stop mode 2: Coast stop Tens digit: Input phase loss (Err12) 0: Continue running 1: Stop according to stop mode 2: Coast stop Hundreds digit: Output phase loss (Err13) 0: Continue running 1: Stop according to stop mode 2: Coast stop Thousands digit: External fault (Err15) 0: Continue running 1: Stop according to stop mode 2: Coast stop Ten-thousands digit: Communication abnormality (Err16) 0: Continue running 1: Stop according to stop mode 2: Coast stop	uint16	01211	W	0x0d29
P13.42	Fault protection action selection 2	Units digit: Encoder/PG card fault (Err20) 0: Continue running 1: Stop according to stop mode 2: Coast stop Tens digit: Parameter read/write abnormality (Err21) 0: Continue running 1: Stop according to stop mode 2: Coast stop Hundreds digit: Software overcurrent (Err24) 0: Continue running 1: Stop according to stop mode 2: Coast stop Thousands digit: Reserved (Err25) 0: Continue running 1: Stop according to stop mode 2: Coast stop Ten-thousands digit: Operation time reached (Err26) 0: Continue running 1: Stop according to stop mode 2: Coast stop	uint16	01201	W	0x0d2a

P13.43	Fault protection action selection 3	Units digit: User-Defined fault 1 (Err27) 0: Continue running 1: Stop according to stop mode 2: Coast stop Tens digit: User-Defined fault 2 (Err28) 0: Continue running 1: Stop according to stop mode 2: Coast stop Hundreds digit: Power-on time reached (Err29) 0: Continue running 1: Stop according to stop mode 2: Coast stop Thousands digit: Load shedding (Err30) 0: Directly jump to 7% of motor rated frequency and continue running; if load is not shed, automatically resume operation at set frequency 1: Stop according to stop mode 2: Coast stop Ten-thousands digit: PID feedback loss during operation (Err31) 0: Continue running 1: Stop according to stop mode 2: Coast stop	uint16	01000	W	0x0d2b
P13.44	Fault protection action selection 4	Units digit: Excessive speed deviation (Err42) 0: Continue running 1: Stop according to stop mode 2: Coast stop Tens digit: Motor overspeed (Err43) 0: Continue running 1: Stop according to stop mode 2: Coast stop Hundreds digit: Initial position error (Err51) 0: Continue running 1: Stop according to stop mode 2: Coast stop Thousands digit: Reserved Ten-thousands digit: Reserved	uint16	02022	W	0x0d2c
P13.45	Fault protection action selection 5	Reserved	uint16	10120	W	0x0d2d

When "Coast stop" is selected, the VFD displays "Err**" and stops immediately.

When "Stop according to stop mode" is selected: The VFD displays "A**" and stops according to the stop mode, then displays "Err**" after stopping. When "Continue running" is selected: The VFD continues running and displays "A**", with the operating frequency set by P13.28.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.46	Fan start temperature	0~100℃	uint16	60	W	0x0d2e

If the cooling fan control (P13.17) is set to operate based on temperature, the fan will turn on when the VFD temperature reaches or exceeds the fan start temperature (P13.46). It will turn off when the VFD temperature falls below (P13.46 - 5° C).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P13.47	Over-torque detection action selection	0: No action 1: Detects over-torque during constant speed operation and continues running 2: Detects over-torque during constant speed operation and stops running 3: Detects over-torque during operation and continues running 4: Detects over-torque during operation and stops running	uint16	0	W	0x0d2f
P13.48	Over-torque detection value	10~250%	uint16	120	W	0x0d30
P13.49	Over-torque detection time	0.1~60S	uint16	0.1	W	0x0d31

When the output current (P28.08) / VFD rated current reaches or exceeds the over-torque detection value (P13.48) and lasts longer than the over-torque detection time (P13.49), the VFD operates according to the action method selected in P13.47 for over-torque detection.

4.15 P14 Fault information parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P14.00	Fault type 1	0: No Fault 1: Reserved 2: Accelerating overcurrent (ERR02) 3: Decelerating overcurrent (ERR03) 4: Constant speed overcurrent (ERR04) 5: Accelerating overvoltage (ERR05) 6: Decelerating overvoltage (ERR06) 7: Constant speed overvoltage (ERR07) 8: Buffer resistor overload fault (ERR08) 9: Undervoltage fault (ERR09) 10: VFD overload (ERR10) 11: Motor overload (ERR11) 12: Input phase loss (ERR12) 13: Output phase loss (ERR13) 14: Module overheat (ERR14) 15: External fault (ERR15) 16: Communication abnormality (ERR16) 17: Contactor abnormality (ERR17) 18: Current detection fault (ERR18) 19: Motor tuning fault (ERR19) 20: Encoder/PG card fault (ERR20) 21: Parameter read/write abnormality (ERR21) 22: VFD hardware fault (ERR22) 23: Motor ground short circuit fault (ERR23) 24: Software overcurrent (ERR24) 25: Reserved (ERR25) 26: Operation time reached (ERR26) 27: User-Defined fault 1 (ERR27) 28: User-Defined fault 2 (ERR28) 29: Power-on time reached (ERR29) 30: Load shedding (ERR30) 31: PID feedback loss during operation (ERR31) 40: Fast current limit timeout fault (ERR40) 41: Motor switching during operation fault (ERR41) 42: Excessive speed deviation (ERR42) 43: Motor overspeed (ERR43) 45: Motor overtemperature (ERR45) 51: Initial position error (ERR51)	uint16	0	R	0x0e00
P14.01	Fault type 2		uint16	0	R	0x0e01
P14.02	Fault type 3		uint16	0	R	0x0e02
P14.03	Fault type 4		uint16	0	R	0x0e03
P14.04	Fault type 5		uint16	0	R	0x0e04
P14.05	Fault type 6		uint16	0	R	0x0e05
P14.06	Fault type 7		uint16	0	R	0x0e06
P14.07	Fault type 8		uint16	0	R	0x0e07
P14.08	Fault type 9		uint16	0	R	0x0e08
P14.09	Fault type 10		uint16	0	R	0x0e09

The last ten fault types are recorded. For specific fault code names and solutions, refer to the fault code table.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P14.10	Fault subcode 1	0~65535	uint16	0	R	0x0e0a
P14.11	Fault subcode 2	0~65535	uint16	0	R	0x0e0b
P14.12	Fault subcode 3	0~65535	uint16	0	R	0x0e0c
P14.13	Fault subcode 4	0~65535	uint16	0	R	0x0e0d
P14.14	Fault subcode 5	0~65535	uint16	0	R	0x0e0e
P14.15	Fault subcode 6	0~65535	uint16	0	R	0x0e0f
P14.16	Fault subcode 7	0~65535	uint16	0	R	0x0e10
P14.17	Fault subcode 8	0~65535	uint16	0	R	0x0e11
P14.18	Fault subcode 9	0~65535	uint16	0	R	0x0e12
P14.19	Fault subcode 10	0~65535	uint16	0	R	0x0e13

The last ten subcodes of fault types are recorded. For specific fault code names and solutions, refer to the fault code table.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P14.20	Frequency during fault 1	0Hz~655.35Hz	uint16	0Hz	R	0x0e14
P14.21	Current during fault 1	0A~655.35A	uint16	0A	R	0x0e15
P14.22	Bus voltage during fault 1	0V~6553.5V	uint16	0V	R	0x0e16
P14.23	Input terminal status during fault 1	0~9999	uint16	0	R	0x0e17
P14.24	Output terminal status during fault 1	0~9999	uint16	0	R	0x0e18
P14.25	VFD status during fault 1	0~65535	uint16	0	R	0x0e19
P14.26	Power-on time during fault 1	0Min~65535Min	uint16	0Min	R	0x0e1a
P14.27	Operating time during fault 1	0Min~6553.5Min	uint16	0Min	R	0x0e1b
P14.28	Frequency during fault 2	0Hz~655.35Hz	uint16	0Hz	R	0x0e1c
P14.29	Current during fault 2	0A~655.35A	uint16	0A	R	0x0e1d
P14.30	Bus voltage during fault 2	0V~6553.5V	uint16	0V	R	0x0e1e
P14.31	Input terminal status during fault 2	0~9999	uint16	0	R	0x0e1f
P14.32	Output terminal status during fault 2	0~9999	uint16	0	R	0x0e20
P14.33	VFD status during fault 2	0~65535	uint16	0	R	0x0e21
P14.34	Power-on time during fault 2	0Min~65535Min	uint16	0Min	R	0x0e22
P14.35	Operating time during fault 2	0Min~6553.5Min	uint16	0Min	R	0x0e23
P14.36	Frequency during fault 3	0Hz~655.35Hz	uint16	0Hz	R	0x0e24
P14.37	Current during fault 3	0A~655.35A	uint16	0A	R	0x0e25
P14.38	Bus voltage during fault 3	0V~6553.5V	uint16	0V	R	0x0e26
P14.39	Input terminal status during fault 3	0~9999	uint16	0	R	0x0e27
P14.40	Output terminal status during fault 3	0~9999	uint16	0	R	0x0e28
P14.41	VFD status during fault 3	0~65535	uint16	0	R	0x0e29
P14.42	Power-on time during fault 3	0Min~65535Min	uint16	0Min	R	0x0e2a
P14.43	Operating time during fault 3	0Min~6553.5Min	uint16	0Min	R	0x0e2b
P14.44	Frequency during fault 4	0Hz~655.35Hz	uint16	0Hz	R	0x0e2c
P14.45	Current during fault 4	0A~655.35A	uint16	0A	R	0x0e2d
P14.46	Bus voltage during fault 4	0V~6553.5V	uint16	0v	R	0x0e2e
P14.47	Input terminal status during fault 4	0~9999	uint16	0	R	0x0e2f
P14.48	Output terminal status during fault 4	0~9999	uint16	0	R	0x0e30
P14.49	VFD status during fault 4	0~65535	uint16	0	R	0x0e31
P14.50	Power-on time during fault 4	0Min~65535Min	uint16	0Min	R	0x0e32
P14.51	Operating time during fault 4	0Min~6553.5Min	uint16	0Min	R	0x0e33
P14.52	Frequency during fault 5	0Hz~655.35Hz	uint16	0Hz	R	0x0e34

P14.53	Current during fault 5	0A~655.35A	uint16	0A	R	0x0e35
P14.54	Bus voltage during fault 5	0V~6553.5V	uint16	0V	R	0x0e36
P14.55	Input terminal status during fault 5	0~9999	uint16	0	R	0x0e37
P14.56	Output terminal status during fault 5	0~9999	uint16	0	R	0x0e38
P14.57	VFD status during fault 5	0~65535	uint16	0	R	0x0e39
P14.58	Power-on time during fault 5	0Min~65535Min	uint16	0Min	R	0x0e3a
P14.59	Operating time during fault 5	0Min~6553.5Min	uint16	0Min	R	0x0e3b
P14.60	Frequency during fault 6	0Hz~655.35Hz	uint16	0Hz	R	0x0e3c
P14.61	Current during fault 6	0A~655.35A	uint16	0A	R	0x0e3d
P14.62	Bus voltage during fault 6	0V~6553.5V	uint16	0V	R	0x0e3e
P14.63	Input terminal status during fault 6	0~9999	uint16	0	R	0x0e3f
P14.64	Output terminal status during fault 6	0~9999	uint16	0	R	0x0e40
P14.65	VFD status during fault 6	0~65535	uint16	0	R	0x0e41
P14.66	Power-on time during fault 6	0Min~65535Min	uint16	0Min	R	0x0e42
P14.67	Operating time during fault 6	0Min~6553.5Min	uint16	0Min	R	0x0e43
P14.68	Frequency during fault 7	0Hz~655.35Hz	uint16	0Hz	R	0x0e44
P14.69	Current during fault 7	0A~655.35A	uint16	0A	R	0x0e45
P14.70	Bus voltage during fault 7	0V~6553.5V	uint16	0V	R	0x0e46
P14.71	Input terminal status during fault 7	0~9999	uint16	0	R	0x0e47
P14.72	Output terminal status during fault 7	0~9999	uint16	0	R	0x0e48
P14.73	VFD status during fault 7	0~65535	uint16	0	R	0x0e49
P14.74	Power-on time during fault 7	0Min~65535Min	uint16	0Min	R	0x0e4a
P14.75	Operating time during fault 7	0Min~6553.5Min	uint16	0Min	R	0x0e4b
P14.76	Frequency during fault 8	0Hz~655.35Hz	uint16	0Hz	R	0x0e4c
P14.77	Current during fault 8	0A~655.35A	uint16	0A	R	0x0e4d
P14.78	Bus voltage during fault 8	0V~6553.5V	uint16	0V	R	0x0e4e
P14.79	Input terminal status during fault 8	0~9999	uint16	0	R	0x0e4f
P14.80	Output terminal status during fault 8	0~9999	uint16	0	R	0x0e50
P14.81	VFD status during fault 8	0~65535	uint16	0	R	0x0e51
P14.82	Power-on time during fault 8	0Min~65535Min	uint16	0Min	R	0x0e52
P14.83	Operating time during fault 8	0Min~6553.5Min	uint16	0Min	R	0x0e53
P14.84	Frequency during fault 9	0Hz~655.35Hz	uint16	0Hz	R	0x0e54
P14.85	Current during fault 9	0A~655.35A	uint16	0A	R	0x0e55
P14.86	Bus voltage during fault 9	0V~6553.5V	uint16	0V	R	0x0e56
P14.87	Input terminal status during fault 9	0~9999	uint16	0	R	0x0e57
P14.88	Output terminal status during fault 9	0~9999	uint16	0	R	0x0e58
P14.89	VFD status during fault 9	0~65535	uint16	0	R	0x0e59
P14.90	Power-on time during fault 9	0Min~65535Min	uint16	0Min	R	0x0e5a
P14.91	Operating time during fault 9	0Min~6553.5Min	uint16	0Min	R	0x0e5b
P14.92	Frequency during fault 10	0Hz~655.35Hz	uint16	0Hz	R	0x0e5c
P14.93	Current during fault 10	0A~655.35A	uint16	0A	R	0x0e5d
P14.94	Bus voltage during fault 10	0V~6553.5V	uint16	0	R	0x0e5e
P14.95	Input terminal status during fault 10	0~9999	uint16	0	R	0x0e5f
P14.96	Output terminal status during fault 10	0~9999	uint16	0	R	0x0e60
P14.97	VFD status during fault 10	0~65535	uint16	0	R	0x0e61
P14.98	Power-on time during fault 10	0Min~65535Min	uint16	0Min	R	0x0e62
P14.99	Operating time during fault 10	0Min~6553.5Min	uint16	0Min	R	0x0e63

Record the frequency, current, busbar voltage, input terminal status, output terminal status, VFD status, time from power-on to fault occurrence, and time from operation start to fault occurrence corresponding to the last ten fault occurrences of

the VFD to facilitate fault cause analysis.

4.16 P15 Communication setting parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.00	Communication type	0: Modbus-RTU 2: CAN	uint16	0	W	0x0f00

Communication type selection

0: Select Modbus-RTU communication.

2: CAN communication protocol. The internal CAN protocol or CANopen slave protocol is selected based on the value of parameter P24.13. The internal CAN protocol supports control by the host computer and the external keypad.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.01	CANopen node	0~0x1ff	uint16	2	W*	0x0f01

P15.00: Used to set the CAN communication node number when CAN communication is selected.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.02	Baud rate	Hexadecimal units digit: Modbus baud rate 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Hexadecimal tens digit: CANopen baud rate 0: 50K 1: 100K 2: 125K 3: 250K 4: 500K 5: 800K 6: 1M	uint16	3	W	0x0f03

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.03	Data format	0: No parity (8-N-2) 1: Even parity (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	uint16	3	W	0x0f03

When P15.00 selects Modbus communication, the required data format must be chosen. The data format must match the host's selected format; otherwise, normal communication cannot be established.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.04	Local address	0~249	uint16	1	W	0x0f04

A local address setting of 0 is a broadcast address. When the host sets the slave communication address to 0 in the data frame, it indicates a broadcast communication address. All slaves on the Modbus bus will receive this frame but will not respond. The local communication address must be unique in the communication network, which is the basis for point-to-point communication between the host computer and the VFD.

Note: When reading the VFD's operating data, the slave address must not be set to 0.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.05	Response delay	0ms~20ms	uint16	2ms	W	0x0f05

After receiving data from the host, the VFD delays sending a response to the host by the time set in P15.05.

If the response delay is less than the system processing time, the response delay shall be based on the system processing time. If the response delay exceeds the system processing time, the VFD will process the data and then delay for the time set in P15.05 before starting to send data to the host.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.06	Communication timeout	0.0s~60.0s	uint16	0.0s	W	0x0f06

When P15.06 = 0, the communication timeout is invalid.

When P15.06 is greater than 0 and less than or equal to 60, if the time between two communications exceeds the communication timeout, the VFD will display an Err16/A16 alarm. In continuously communicating systems, the communication status can be monitored by setting the communication timeout.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.07	Data transmission format selection	0: Non-standard Modbus-RTU (response to read = 2-byte data length) 1: Standard Modbus-RTU (response to read = 1-byte data length) Units digit: Modbus data format Tens digit: Reserved	uint16	1	W	0x0f07

When P15.00 selects Modbus communication, set the units digit of P15.07 to choose between the standard Modbus protocol or non-standard Modbus format.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.08	Current resolution read via communication	0: 0.01A 1: 0.1A	uint16	0	W	0x0f08

The number of decimal places for current-related parameter values read via communication.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.10	CANOPEN station number	0~0x1f	uint16	1	W	0x0f0a

It is used to set the CANOPEN communication node number when selecting CAN communication.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P15.11	485 Hardware type	0: Non-isolated 485 (built-in 485) 1: Isolated 485 (expansion card 485)	uint16	0	W	0x0f0b

4.17 P28 Communication setting parameter group

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.00	Current power-on time	0Min~65535Min	uint16	0Min	R	0x1C00

It displays the elapsed time since the VFD was powered on.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.01	Current running time	0Min~6553.5Min	uint16	0Min	R	0x1C01

It displays the elapsed time since the VFD was powered on, and automatically resets to zero after stop.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.02	VFD operating status	0~65535	uint16	0	R	0x1C02

It indicates the current operating status of the VFD. Data definitions are as follows:

P28.02	Bit0	0: Stopped 1: Forward rotation 2: Reverse rotation
	Bit1	
	Bit2	0: Constant speed 1: Accelerate 2: Decelerate
	Bit3	
	Bit4	0: Normal 1: Undervoltage

Example: When the VFD is running forward and accelerating, P28.02 = 5; when running forward and decelerating, P28.02 = 9.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.03	Fault information	0~65535	uint16	0	R	0x1C03

It displays the current fault code.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.04	Operating frequency	0Hz~655.35Hz	uint16	0Hz	R	0x1C04

It displays the absolute value of the VFD's current theoretical operating frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.05	Set frequency	0Hz~655.35Hz	uint16	0Hz	R	0x1C05

It displays the absolute value of the currently set frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.06	Bus voltage	0v~6553.5v	uint16	0v	R	0x1C06

It displays the current bus voltage of the VFD.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.07	Output voltage	0v~65535v	uint16	0v	R	0x1C07

P28.08	Output current	0A~655.35A	uint16	0A	R	0x1C08
P28.09	Output power	0kW~6553.5kW	uint16	0kW	R	0x1C09

It displays the output voltage, output current, and output power values during VFD operation.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.10	Target torque	0%~6553.5%	uint16	0%	R	0x1C0a

It shows the percentage of the VFD's current torque upper limit setting.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.11	Output torque	0%~655.35%	uint16	0%	R	0x1C0b

It shows the percentage of the motor's rated torque.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.12	Feedback frequency	0.0HZ~3276.7HZ 0.00HZ~327.67HZ	uint16	0.00Hz	R	0x1C0c

It displays the actual output frequency of the VFD, with the number of decimal places determined by the frequency command decimal point setting in P00.18.

When P00.18 = 1, the range of P28.12 is 0.0Hz to 3276.7Hz;

When P00.18 = 2, the range of P28.12 is 0.0Hz to 327.67Hz.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.13	Detected frequency	0.0HZ~3276.7HZ 0.00HZ~327.67HZ	uint16	0.00Hz	R	0x1C0d

It displays the actual measured motor operating frequency from the encoder, with the number of decimal places determined by the frequency command decimal point setting in P00.18.

When P00.18 = 1, the range of P28.12 is 0.0Hz to 3276.7Hz;

When P00.18 = 2, the range of P28.12 is 0.0Hz to 327.67Hz.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.14	Resolver position	0~65535	uint16	0	R	0x1C0e

It displays the current position signal of the resolver.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.15	ABZ position	0~65535	uint16	0	R	0x1C0f

It displays the number of AB-phase pulses from the current ABZ encoder; the current value represents 4× frequency pulse count. When the current value is 4000, the actual encoder pulses passed are 4000/4 = 1000.

The value of P28.15 increases automatically when the encoder rotates forward and decreases automatically when rotating backward. The maximum value of P28.15 is 65535. When the pulse count exceeds 65535, it resets to 0 and starts recounting.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.16	Z-Signal counter	0~65535	uint16	0	R	0x1C10

It displays the current count of Z-phase pulses from the ABZ encoder.

When the encoder rotates forward one full turn, P28.16 increases by 1; when rotating backward one full turn, P28.16 decreases by 1. P28.16 can be used to check if the encoder is installed correctly.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.17	Synchronous machine rotor position	0.0° ~6553.5°	uint16	0.0°	R	0x1C11

It displays the current position of the synchronous machine rotor.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.18	Power factor angle	0.0° ~6553.5°	uint16	0.0°	R	0x1C12

It displays the current operating power factor angle.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.19	Controller temperature	0.0℃ ~6553.5℃	uint16	0.0℃	R	0x1C13

It displays the current temperature of the VFD, used for temperature-related pre-alarm and control functions.

When the cooling fan control parameter P13.17 is set to 2 (temperature-based control), the fan operation is determined by the following logic:

If P28.19 is greater than or equal to the fan start temperature P13.46, the fan will operate.

If P28.19 is less than (P13.46 minus 5° C), the fan will stop operating.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.20	Motor temperature value	0.0℃ ~6553.5℃	uint16	0.0℃	R	0x1C14

Reserved.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.21	DI input status	0~65535	uint16	0	R	0x1C15

It displays the input status of DI1~5 and HDI.

From left to right: DI1~HDI. A lit digital tube indicates a high level; an unlit digital tube indicates a low level.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.22	DO output status	0~65535	uint16	0	R	0x1C16

It displays the output status of DO1~DO2 and relay outputs.

From left to right: Relay, DO1, DO2. A lit digital tube indicates the output is active; an unlit digital tube indicates no output.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.25	Fan flag	0~1	uint16	0	R	0x1C19

0 indicates the fan is stopped, 1 indicates the fan is running.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.27	AI1 voltage	0.00v~655.35v	uint16	0.00v	R	0x1C1b
P28.28	AI2 voltage	0.00v~655.35v	uint16	0.00v	R	0x1C1c
P28.29	AI3 voltage	0.00v~655.35v	uint16	0.00v	R	0x1C1d

P28.27 displays the sampled voltage value of AI1; P28.28 displays the sampled voltage value of AI2.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.30	AI1 uncorrected voltage	0.00v~655.35v	uint16	0.00v	R	0x1C1e
P28.31	AI2 uncorrected voltage	0.00v~655.35v	uint16	0.00v	R	0x1C1f
P28.32	AI3 uncorrected voltage	0.00v~655.35v	uint16	0.00v	R	x1C20

It displays the actual sampled input voltage values of the analog signals. In practical use, linear correction is applied to minimize the deviation between the sampled analog voltage and the actual input voltage.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.33	VF decoupled target voltage	0v~65535v	uint16	0v	R	0x1C21
P28.34	VF decoupled output voltage	0v~65535v	uint16	0v	R	0x1C22

It displays the target decoupled voltage and actual output voltage of the VF during VF decoupled operation.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.35	Communication set value	0%~655.35%	uint16	0%	R	0x1C23

It is the frequency percentage value given via communication. The set frequency = P28.35 × P00.08 (maximum frequency).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.36	Main frequency X display	0.00Hz~655.35Hz	uint16	0.00Hz	R	0x1C24
P28.37	Auxiliary frequency Y display	0.00Hz~655.35Hz	uint16	0.00Hz	R	0x1C25

P28.36 displays the setting of the main frequency source X; P28.37 displays the setting of the auxiliary frequency Y.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.38	Load speed display	0~65535	uint16	0	R	0x1C26

For details, refer to P10.10.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.39	PID setting	0~65535	uint16	0	R	0x1C27
P28.40	PID feedback	0~65535	uint16	0	R	0x1C28

P28.39 displays the PID set value; P28.40 displays the PID feedback value.

PID set value = PID setpoint (percentage) × P08.04

PID feedback value = PID feedback (percentage) × P08.04

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.41	PLC stage	0~65535	uint16	0	R	0x1C29

It displays the current operating stage of the simplified PLC (16 speed segments in total).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.42	Count value	0~65535	uint16	0	R	0x1C2a

It displays the count value in the counting function.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.43	Length value	0~65535	uint16	0	R	0x1C2b

It displays the length value in the fixed-length function.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.44	PULSE input pulse frequency	0Hz~65535Hz	uint16	0Hz	R	0x1C2c

It displays the sampling frequency of the HDI high-speed pulse, in Hz.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.45	PULSE input pulse frequency	0kHz~655.35kHz	uint16	0kHz	R	0x1C2d

It displays the sampling frequency of the HDI high-speed pulse, in kHz.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.46	Linear speed	0m/Min~65535m/Min	uint16	0m/Min	R	0x1C2e

It displays the linear speed sampled by the HDI high-speed pulse, in m/min.

P28.46 = Actual sampled pulses per minute / P09.12 (pulses per meter).

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.47	Remaining running time	0Min~6553.5Min	uint16	0Min	R	0x1C2f

It displays the remaining running time during timed operation.

For details on the timed operation function, refer to P09.26~P09.28.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.50	Operating speed	0~65535	uint16	0	R	0x1C32

Real-time operating speed calculated from motor parameters and current operating frequency.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.52	Fault subcode	0~65535	uint16	0	R	0x1C34

Used to assist in locating faults when certain malfunctions occur.

Parameter ID	Parameter name	Setting range	Parameter type	Factory value	Attribute	Communication address
P28.55	Next fault save index	0~9	uint16	0	R	0x1C37

When a fault occurs next time, it is saved to the P14 group. If the index is 0, the next fault will be saved to Fault 1, and so on.

Appendix 1 Fault Alarm Codes and Troubleshooting Methods

Chapter 1 Fault Alarm Codes and Troubleshooting Methods Table

During product operation, the following types of faults may occur. Please refer to the fault diagnosis and troubleshooting methods described below.

Fault code	Fault name	Fault diagnosis	Troubleshooting
ERR00	No fault	-	-
ERR01	Reserved	-	-
ERR02	Accelerating overcurrent	Acceleration time set too short	Extend the acceleration time.
		Starting a rotating motor	Stop the motor from rotating before restarting.
		VFD capacity too small	Select a VFD with appropriate capacity.
		Inappropriate V/F curve settings or excessively high torque boost value	Reset the V/F curve or torque boost value.
ERR03	Decelerating overcurrent	Deceleration time set too short	Extend the deceleration time.
		Potential energy load or excessive load inertia	Select a suitable braking resistor.
		VFD capacity too small	Select a VFD with appropriate capacity.
ERR04	Constant speed overcurrent	Motor burnout or insulation aging	Check the motor's insulation resistance.
		Excessive load (brake not opened)	Measure the current flowing through the motor. Verify if the motor brake is open during operation.
		Long wiring length of the motor cable	Increase the VFD capacity.
		Using a special motor or a motor exceeding the maximum applicable capacity	Confirm if the motor model, power, and VFD are compatible.
		Incorrect parameter settings	Check if the motor parameters match the VFD settings. Review the motor protection parameter configurations.
		Hardware fault	Inspect the IGBT for malfunctions.
ERR05	Accelerating overvoltage	Power supply voltage fluctuation exceeds limits	Check the grid voltage.
		Starting a rotating motor	Stop the motor from rotating before restarting.
ERR06	Decelerating overvoltage	Short deceleration time with excessive regenerative energy from the motor to the VFD	Increase deceleration time (P00.14).
		Potential energy load or excessive load inertia	Reduce the load, increase VFD capacity, or select a suitable braking unit and braking resistor.
		Power supply voltage fluctuation limit exceeded	Check the grid voltage.
ERR07	Constant speed overvoltage	Potential energy load or excessive load inertia	Increase the braking resistor power.
		Surge voltage mixed in the input power supply	Install a DC reactor. In the same power system, switching phase-advancing capacitors or thyristor converters may cause a brief, abnormal, sharp rise (surge) in input voltage.
		Excessively high power supply voltage	Check the voltage. Reduce it to within the VFD's power supply specification range.
		Incorrect wiring of the braking resistor or braking resistor unit	Verify if the wiring to the braking resistor or unit is incorrect. Reconnect correctly.
		Incorrect parameter settings	Motor misalignment or vibration.
ERR08	Buffer resistor overload fault	Multiple starts/stops of the rectifier unit within 1 second	Confirm power supply stability. Check the rectifier unit's start DI connection.

ERR09	Undervoltage fault	Phase loss in input power supply	Check if the main circuit power supply wiring is disconnected or incorrectly connected. Ensure correct wiring.
		Loose terminal of the input power supply	Confirm if the terminal is loose or the fuse is blown.
		Rectifier unit start failed	Confirm if the rectifier unit has started.
		Power outage	Improve the power supply.
		Relay or contactor malfunction in the VFD's internal surge prevention circuit	Toggle the power supply to check for faults. If faults persist, replace the circuit board or VFD.
		Voltage supply failure	Check the voltage. Adjust the voltage to within the VFD's power supply specification range. If the main circuit power supply is normal, check for faults in the main circuit MC.
ERR10	VFD overload	Excessive load	Select a VFD matching the motor capacity.
		Acceleration time set too short	Extend the acceleration time.
		Starting a rotating motor	Stop the motor from rotating before restarting.
		Inappropriate V/F curve settings or excessively high torque boost value	Reset the V/F curve or torque boost value.
ERR11	Motor overload	Excessive load (brake not opened)	Measure the current flowing through the motor. Verify if the motor brake is open during operation.
		Short acceleration/deceleration time or cycle time	Increase the deceleration time or use a larger VFD.
		Incorrect parameter settings	Check if motor parameters match VFD settings. Review motor protection parameters.
		Using a special motor or a motor exceeding the maximum applicable capacity	Confirm if the motor model, power, and VFD are compatible.
ERR12	Input phase loss	Phase loss in input power supply	Check if the main circuit power supply wiring is disconnected or incorrectly connected. Refer to wiring instructions for the correct connection.
		Loose terminal of the input power supply	Confirm if the terminal is loose.
		Imbalanced phase-to-phase voltage	Confirm the power supply voltage. Take measures to stabilize the power supply.
		Excessive voltage fluctuation in the input power supply	Confirm the power supply voltage. Take measures to stabilize the power supply.
ERR13	Output phase loss	Output cable disconnected	Confirm if the output cable wiring is disconnected or incorrectly connected.
		Motor coil disconnected	Measure the motor's line-to-line resistance.
		Loose output terminal	Confirm if the terminal is loose.
		Single-phase motor connected	This VFD cannot be used with single-phase motors.
		Motor capacity below 5% of the VFD's rated output current.	Adjust the VFD capacity or motor capacity.
		Open-circuit damage to the VFD's output transistor.	Replace the circuit board or VFD.

ERR14	Equipment overheating	Ambient temperature too high	Confirm the ambient temperature. Improve ventilation in the control cabinet. Install cooling devices (e.g., cooling fans or air conditioners) to reduce temperature. Remove nearby heat sources.
		Heavy load	Measure the output current. Reduce the load. Lower the carrier frequency.
		Built-in cooling fan of the VFD stops	Replace the cooling fan.
ERR15	External fault	External DI fault input	Check the external DI fault input.
ERR16	Communication abnormality	Modbus communication timeout	Check the Modbus communication.
ERR18	Current detection fault	Excessive zero drift detection	Check the current sampling circuit.
ERR19	Motor tuning fault	Motor detection timeout	Inspect motor wiring.
		Significant capacity difference between the motor and the VFD	Select a VFD with appropriate capacity.
		Motor detected under load	Dismantle the load and re-detect.
		Incorrect motor parameter settings	Set motor parameters again according to the motor nameplate.
ERR21	Parameter Read/ Write abnormality	Electromagnetic interference during storage	Re-enter and store parameters.
		EPROM damage	Contact the manufacturer's technical support.
ERR23	Motor ground short circuit fault	Motor burnout or insulation aging	Confirm the motor's insulation resistance.
		Cable damage causing contact or short circuit	Inspect the motor's power cable.
		Large distributed capacitance between the cable and the grounding terminal	If the cable length exceeds 100m, lower the carrier frequency. Take measures to reduce distributed capacitance.
		Hardware fault	Replace the circuit board or VFD.
ERR24	Software overcurrent	Current exceeds the set software overcurrent threshold.	Check the software overcurrent threshold settings.
ERR26	Operation time reached	Cumulative operation time reaches the set limit.	
ERR27	User-Defined fault 1	User-Defined fault 1 DI input is active.	
ERR28	User-Defined fault 2	User-Defined fault 2 DI input is active.	
ERR29	Power-on time reached	Cumulative power-on time reaches the set limit.	
ERR30	Load shedding	Asynchronous motor operation with output current less than 5% of the motor's rated current	Check the motor's operating status.
ERR31	PID feedback loss during operation	Incorrect parameter settings	Adjust parameters.
		Incorrect PID feedback wiring	Check for wiring errors in PID control.
		Faulty feedback sensor	Check the sensor status on the controlled machine side.
ERR40	Fast current limit timeout fault	Single-tube continuous wave-by-wave current limiting time exceeds 500ms.	Contact the manufacturer's technical support.
ERR42	Excessive speed deviation	Incorrect parameter settings	Increase the speed deviation parameters P03.32 and P03.33.
		Excessive potential energy load or load inertia	Extend acceleration/deceleration time and select a motor/VFD matching the load.
ERR51	Initial position error	Unable to identify the initial magnetic pole position.	Inspect the motor.

Innovation Integrity Service

HCFA

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