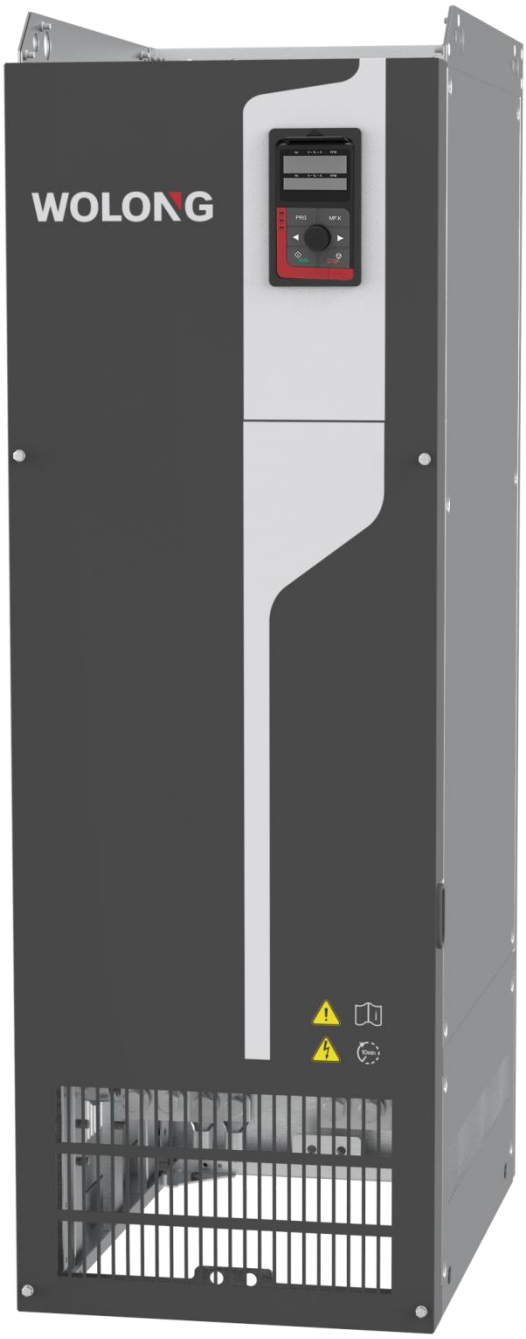


WD400 Series High-Performance General-Purpose AC Drive

User Guide

WOLONG

Power your future

Thank You for Choosing Wolong's WD400 Series AC Drive!

Designed and developed by Wolong Electric, WD400 Series is a new generation of high-performance general-purpose vector AC drive, which supports regular AC asynchronous motors and multiple high-efficiency motor control algorithms. It can be perfectly integrated with Wolong's synchronous and asynchronous motors, tailored for higher energy efficiency. Compared with the last generation, WD400 boasts significant improvements for having reached the industry frontier in terms of speed control range, torque output accuracy, low-frequency characteristics, and other key performance indices. Coupled with Safe Torque Off (STO), WD400 ensures both personal and equipment safety. Also, it is available in overseas high-end scenarios for its compliance with CE, UL, EAC, Marine Classification Certification and other international certification standards.

Featuring excellent reliability, performance, extensibility, and ease of assembly, WD400 is rather user-friendly. It can be applied in blowers, water pumps, compressors, metallurgy, mining, petroleum and petrochemical, cement, power plants, material handling, HVAC, textiles, injection molding, marine industries as well as customized scenarios.

About This Guide

This Guide introduces the functions, characteristics, and application of Wolong's WD400 Series AC Drive, including its installation, wiring, and parameter setting. Before use, please read this Guide carefully. Supporting manufacturers should deliver the equipment, with this Guide attached, to end users for future reference.

Technical Support

Please feel free to contact Wolong if there is any problem in using the product.

To ensure the accuracy of this Guide, we have conducted a thorough review of the contents. However, we appreciate your feedback and advice if any errors.

Wolong Electric reserves the right to optimize the product technology and interpret this Guide. If any amendments, please forgive us for not issuing a separate notice, and users may refer to the relevant technical agreements.

Content

Safety Information

Notice

Please read these instructions carefully and familiarize yourself with this equipment before installation, operation, or maintenance. The following special warnings may appear elsewhere in this document or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a process.

This is a safety symbol of "Danger" or "Warning". It indicates the presence of electrical hazards. Failure to follow the operating instructions may result in personal injury.

This is a safety alert symbol. It is used to alert you to potential personal injury hazards. Please adhere to all safety precautions labeled with this symbol to avoid potential personnel casualties.

This is a symbol of static sensitivity. Failure to comply with the relevant requirements may cause damage to PCB boards.

This is a symbol of high temperature. The base of the AC drive is hot. Do not touch.

DANGER
"Danger" indicates an imminently hazardous situation, which, if not avoided, **will result in death or serious injury**.

WARNING
"Warning" indicates a potentially hazardous situation, which, if not avoided, **could result in death, serious injury, or property damage**.

CAUTION
"Caution" indicates a potentially hazardous situation, which, if not avoided, **may result in personal injury or property damage**.

ATTENTION!
"*Attention!*" used without the safety alert symbol indicates a potentially hazardous situation, which, if not avoided, **may result in property damage**.

The installation, operation, maintenance, and repair of electrical equipment must be carried out exclusively by professionals. Wolong Electric disclaims any legal liability for personal injuries, property damage, or other incidents resulting from non-compliance with the instructions in this manual or from improper operation of the product.

Preparation

Please read and understand these instructions before you perform any operations on the AC drive.

⚠ DANGER

Hazards of Electric Shock, Explosion, or Arc Flash

• The AC drive should only be operated by personnel who are familiar with and fully understand this Guide, as well as other documents related to this product, and have received necessary training in identifying and avoiding relative risks.

• The AC drive should only be installed, commissioned, and maintained by trained professionals.

• Check the compliance with local and national electrical codes, as well as other applicable regulations related to equipment grounding.

• Use only insulating tools and measuring equipment with proper ratings.

• Do not touch unshielded components or terminals when the power is ON.

• Lock the motor shaft before any operations to prevent unexpected rotation.

• Insulate both ends of the unused conductors of the motor cable.

• Avoid short-circuiting DC bus terminals or brake resistor terminals.

• Before any operations on the AC drive:
- Cut off all power supplies, including the external control power supply;
- Affix a "Do Not Switch On" label on all power switches;
- Keep all power switches OFF;
- Wait 10 minutes for the DC bus capacitor to discharge;
- Ensure that there is no other voltage in the system.

• Before powering on the AC drive:
- Ensure that the work is fully completed and there is no hazardous installation error;
- If the main power supply's input terminals and the motor's output terminals are grounded and short-circuited, clear the grounding and short circuit faults;
- Ensure that all devices are properly grounded.

• Ensure that protective devices such as safety doors and barriers are installed and/or closed.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

Unanticipated Operation

If incorrect wiring, settings, or other errors, unanticipated equipment operation is possible.

• Carefully install the cables per the EMC requirements;

• Do not operate the product using unknown or inappropriate settings or data;

• The commissioning tests must serve field application.

Failure to follow these instructions could result in death, serious injury, or property damage.

⚠ DANGER

Electric Shock or Unexpected Startup

Do not use damaged products or accessories, otherwise it can lead to electric shock or unexpected equipment startup.

Failure to follow these instructions will result in death or serious injury.

⚠ ATTENTION

Hazard of Equipment Damage

In working environments with high temperatures, moisture, oil contamination, chemicals, dust, vibrations, and other challenging conditions, regular cleaning and maintenance are necessary to prevent the AC drive's service life from being shortened or the AC drive from being damaged.

Do not modify the AC drive, otherwise it can lead to fire, electric shock, or other hazards.

Failure to follow these instructions could result in death, serious injury, or property damage.

⚠ DANGER

Hazards of Fire and Electric Shock

Do not modify the AC drive, otherwise it can lead to fire, electric shock, or other hazards.

Failure to follow these instructions will result in death or serious injury.

DANGER

Explosion Hazard

Install and use this equipment only in non-hazardous positions.

Failure to follow these instructions will result in death or serious injury.

WARNING

Loss of Control

• Designers of any control scheme must consider all possible situations where the control path may become uncontrollable and devise corresponding response plans, including emergency stop, power disconnection, and restart.

• Since the system control paths may include communication control, possibilities of unexpected transmission delays or line failures must be considered.

• Adhere to all accident prevention procedures and local safety guidelines.

Failure to follow these instructions could result in death, serious injury, or property damage.

WARNING

Hazard of Equipment Damage

Since the electronic components inside the AC drive are static-sensitive devices, anti-static measures must be taken during relevant operations.

Failure to follow these instructions could result in property damage.

WARNING

Burn Hazard

During operation, the heat sink base of the AC drive can be hot. Do not touch.

Failure to follow these instructions could result in serious injury.

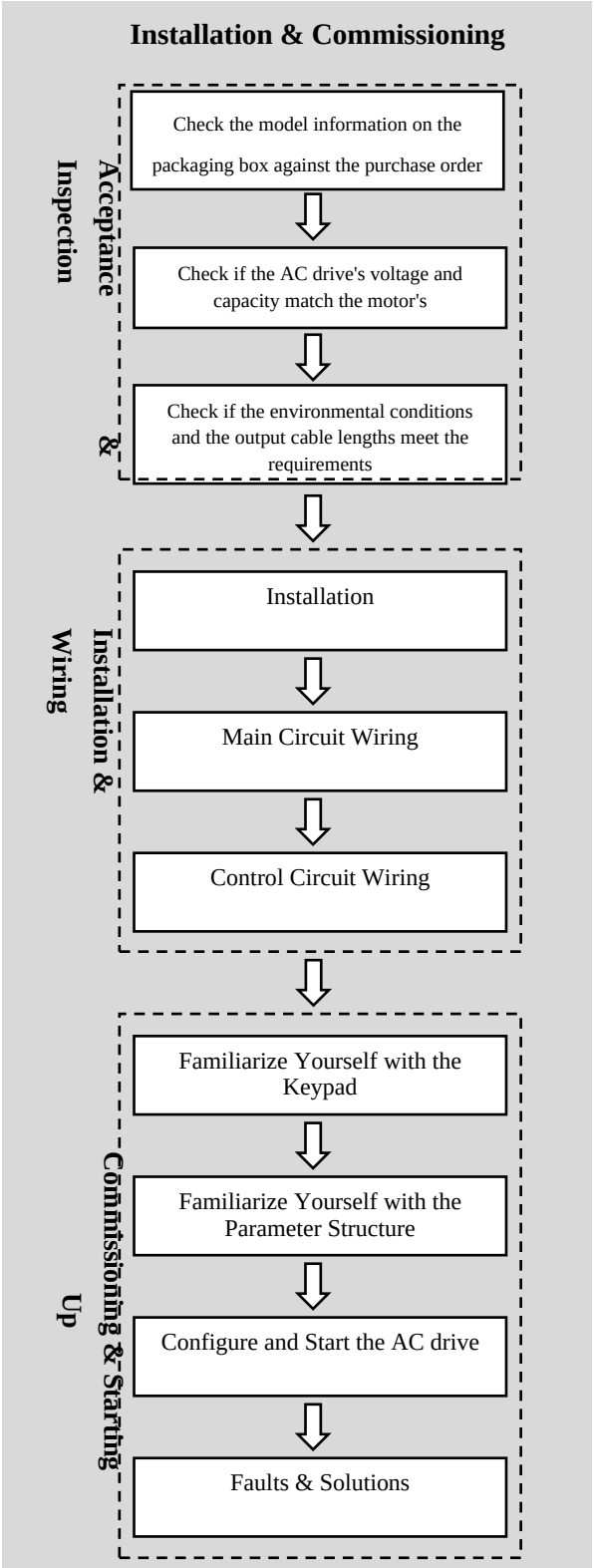
Technical Parameters

Supply Voltage & Power Range	Single-Phase: 200V ~ 240V - 10% ~ 10% Three-Phase: 200V ~ 240V - 10% ~ 10% Three-Phase: 380V ~ 480V - 15% ~ 10% Three-Phase: 660V ~ 690V - 10% ~ 10% 0.75-1000kW
Power Supply Frequency	50/60Hz ±5%
Motor Type	Three-Phase Induction Motor (IM); Permanent Magnet Synchronous Motor (PMSM);
Control Mode	V/F Control; Sensorless Vector Control (SVC); Field-Oriented Vector Control (FVC)
Speed Regulation Range	1: 500
Steady Speed Accuracy	±0.5%（SVC） ±0.02%（FVC）
Torque Control Accuracy	±3% (SVC: Above 5Hz) ±2%（FVC: Above 5Hz)
Starting Torque	200%
Overload Capacity	Heavy Load: 150% of rated current for 60 seconds Light Load: 120% of rated current for 60 seconds
Output Frequency	0-600Hz
Analog Input	2 Channels: AI1 (0-10V/0-20mA/4-20mA), AI2 (0-10V/0-20mA/4-20mA)
Analog Output	2 Channels: AO1 (0-10V/0-20mA/4-20mA), AO2 (0-10V/0-20mA/4-20mA) Note: Models with Rack Size 5 and below are subject to 1-channel AO output.
Digital Input	7-Channel Programmable Digital Input (with a maximum input frequency of 1KHz and an internal impedance of 4.4KΩ) Note: Models with Rack Size 5 and below are subject to 5-channel programmable digital input.
Digital Output	1-Channel Programmable Open-Collector Logic Output (with a maximum current of 1.2mA when powered by internal supply and a maximum current of 200mA when powered by external supply) 1-Channel High-Speed Pulse Output (with a maximum frequency of 100kHz)

Relay Output	2-Channel Programmable Relay Output: TA1/NO1 Normally Open Contact; TB1/NC1 Normally Closed Contact; TC1/CM1 Common Terminal TB2/NO2 Normally Open Contact; TC2/CM2 Common Terminal Note: Models with Rack Size 5 and below are subject to 1-channel relay output.
Communication Interface	Modbus RTU Communication: A+/B-/485G
Expansion Interface	2 Expansion Interfaces: EX-A (SLOT1) and EX-B (SLOT2) Options: I/O expansion modules, speed feedback encoder modules, communication modules, etc.

Optional Modules	
Fieldbus Adapter Module	Profibus-DP, Profinet, Ethernet, Modbus, CANopen, Bluetooth, IoT Modules.
I/O Expansion Module	4 Digital Inputs (including 1 high-speed input); 1 Digital Output; 1 Analog output; 1 Relay Output 1 Temperature Input (PT100/PT1000)
Speed Feedback Module	Incremental Encoder; Rotary Encoder;
Other Optional Accessories	
LCD Keypad	Available for the entire WD400 Series
Brake Unit	Standard built-in brake unit for 0.75-22kW Optional built-in brake unit for 30-160kW Optional external brake unit for above 160kW
Main Functions	Control of asynchronous or permanent magnet synchronous motors, V/F or vector control, open-loop/closed-loop control, speed control, torque control, PID control, multi-segment speed, simple PLC, swing frequency control, counting and timing, speed tracking startup, etc.
Installation Methods	Rail Mounting; Wall Mounting; Flange Mounting; Floor Standing
Cooling Method	Forced Air Cooling
Protection Level	IP20
Operating Temperature	-10°C to +50°C (derating is required for temperatures above 40°C, and derate by 1.5% for every 1°C higher than 40°C)
Storage Temperature	-20℃ ~ +60℃
Compliance	IEC61800-5-1; GB12668
Harmonic Suppression	Meets IEC61800-2 requirements

Quick Installation and Commissioning



Reference

AC Drive Acceptance and Inspection (Page 10)

Environment Conditions (Page 12)

AC Drive Installation (Page 18)

Electrical Wiring Diagram (Page 25)

Pre-Wiring Inspection (Page 27)

Wiring Instructions (Page 34)

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Factory Settings (Page 54)

Introduction to Common Function Parameters (Page 55)

Simple Startup (Page 56)

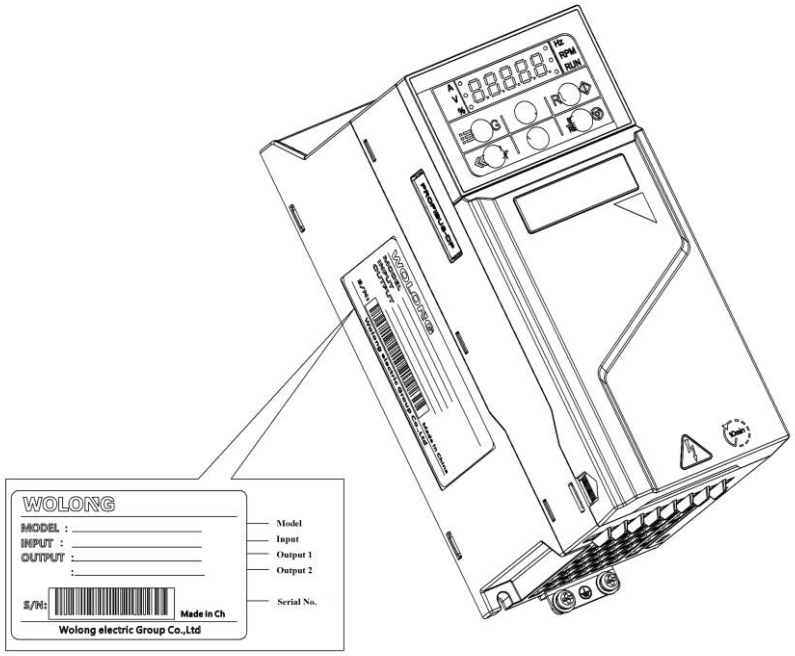
Complete Parameter Tables (Page 128)

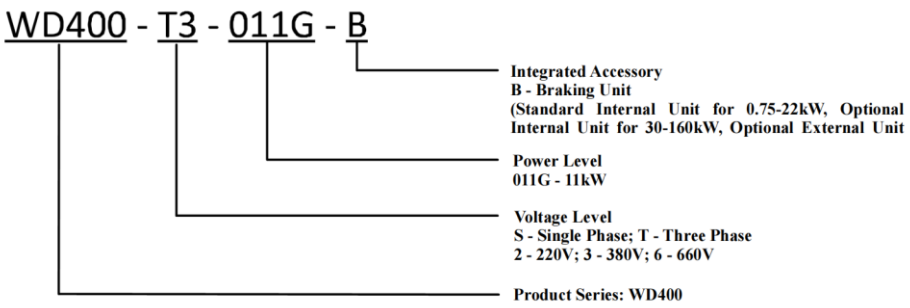
Faults - Causes - Solutions (Page 205)

1. AC Drive Acceptance and Inspection

1.1 Check the Model Information on the Packaging Box Against the Purchase Order

The nameplate and the name rules are specified as follows:





1.2 Remove the AC Drive From the Packaging Box and Check If It Has Been Damaged During Transportation

- Check if the packaging box is damaged or dampened;
- After unpacking, check if there is any damage to the housing of the AC drive;

- Check if the AC drive nameplate matches the model identification on the packaging box;
- Please check if the accessories inside the packaging box are intact.
-

If any of the above issues are found, please contact the dealer or Wolong.

2. Environment Conditions

2.1 Temperature and Derating

Condition	Temperature		Derating
Storage	-20 ~ 60	°C	O
Operation	-10 ~ 40	°C	O
	50 (Max)	°C	√
Note: √: The rated operating temperature is 40°C; derate by 1.5% for every 1°C above 40°C. O: No derating required. Install a heating device for temperatures below -10°C.			

2.2 Altitude and Derating

Altitude	Derating
1000m	O
1000 ~ 3000m	√
Note: √: Derated by 1% for every 100m above 1000m. O: No derating required. Above 3000m, please contact Wolong Technical Support.	

2.3 Relative Humidity

Less than 95%RH; no condensation.

2.4 Other Environmental Requirements

- No exposure to severe vibration or shock (maximum amplitude 5.8m/s² or 0.6g);
- No ingress of metal powder, dust, oil, water, or biological contaminants into the AC drive;
- Avoid direct sunlight, oil mist, steam, or saline environments;
- Install away from electromagnetic radiation sources.

If the above environmental requirements cannot be met, please consult Wolong Technical Support.

3. AC Drive Ratings

Power Supply Voltage: Single-Phase 200V ~ 240V 50/60Hz

Motor		AC Drive (Output)		Model	Rack Size
Working Condition	Specified Power	Maximum Continuous Output Current In	Maximum Instantaneous Current 1.5In (Heavy Load; 60s)		
	kW	A	A		
Heavy Load	0.75	4	6	WD400-S2-R75G-B	Rack Size 1
Heavy Load	1.5	7	10.5	WD400-S2-1R5G-B	
Heavy Load	2.2	10	15	WD400-S2-2R2G-B	Rack Size 2
Heavy Load	4	16	24	WD400-S2-004G-B	

Power Supply Voltage: Three-Phase 200V ~ 240V 50/60Hz

Motor			AC Drive (Output)		Model	Rack Size
Working Condition	Specified Power		Maximum Continuous Output Current In	Maximum Instantaneous Current 1.5In (Heavy Load; 60s)		
	kW	HP	A	A		
Heavy Load	0.75	1	4	6	WD400-T2-R75G-B	Rack Size 1
Heavy Load	1.5	2	7	9	WD400-T2-1R5G-B	
Heavy Load	2.2	3	10	15	WD400-T2-2R2G-B	Rack Size 2
Heavy Load	4	5	16	24	WD400-T2-004G-B	
Heavy Load	5.5	7.5	20	30	WD400-T2-5R5G-B	Rack Size 3
Heavy Load	7.5	10	30	45	WD400-T2-7R5G-B	Rack Size 4
Heavy Load	11	15	42	63	WD400-T2-011G-B	
Heavy Load	15	20	55	82.5	WD400-T2-015G-B	Rack Size 5
Heavy Load	18.5	25	70	105	WD400-T2-018G-B	
Heavy Load	22	30	80	120	WD400-T2-022G-B	
Heavy Load	30	40	110	165	WD400-T2-030G	Rack Size 6
Heavy Load	37	50	130	195	WD400-T2-037G	
Heavy Load	45	60	160	240	WD400-T2-045G	
Heavy Load	55	75	200	300	WD400-T2-055G	Rack Size 7

Power Supply Voltage: Three-Phase 380V ~ 480V 50/60Hz

Motor			AC Drive (Output)			Model	Rack Size
Working Condition	Specified Power		Maximum Continuous Output Current In	Maximum Instantaneous Current 1.5In (Heavy Load; 60s)	Maximum Instantaneous Current 1.2In (Light Load; 60s)		
	kW	HP	A	A	A		
Heavy Load	0.75	1	3	4.5	-	WD400-T3-R75G-B	Rack Size 1
Light Load	1.5	2	4	-	4.8		
Heavy Load	1.5	2	4	6	-	WD400-T3-1R5G-B	
Light Load	2.2	3	6	-	7.2		
Heavy Load	2.2	3	6	9	-	WD400-T3-2R2G-B	
Light Load	-	-	-	-	-		
Heavy Load	4	5	10	15	-	WD400-T3-004G-B	Rack Size 2
Light Load	5.5	7.5	13	-	15.6		
Heavy Load	5.5	7.5	13	19.5	-	WD400-T3-5R5G-B	
Light Load	7.5	10	17	-	20.4		
Heavy Load	7.5	10	17	25.5	-	WD400-T3-7R5G-B	Rack Size 3
Light Load	11	15	25	-	30		
Heavy Load	11	15	25	37.5	-	WD400-T3-011G-B	
Light Load	15	20	32	-	38.4		
Heavy Load	15	20	32	48	-	WD400-T3-015G-B	Rack Size 4
Light Load	18.5	25	38	-	45.6		
Heavy Load	18.5	25	38	57	-	WD400-T3-018G-B	
Light Load	22	30	45	-	54		
Heavy Load	22	30	45	67.5	-	WD400-T3-022G-B	
Light Load	30	40	60	-	72		
Heavy Load	30	40	60	90	-	WD400-T3-030G	Rack Size 5
Light Load	37	50	75	-	90		
Heavy Load	37	50	75	112.5	-	WD400-T3-037G	
Light Load	45	60	90	-	108		
Heavy Load	45	60	90	135	-	WD400-T3-045G	Rack Size 6
Light Load	55	75	110	-	132		
Heavy Load	55	75	110	165	-	WD400-T3-055G	
Light Load	75	100	150	-	180		
Heavy Load	75	100	150	225	-	WD400-T3-075G	
Light Load	90	125	180	-	216		
Heavy Load	90	125	180	270	-	WD400-T3-090G	Rack Size 7
Light Load	110	150	210	-	252		
Heavy Load	110	150	210	315	-	WD400-T3-110G	

Light Load	132	200	250	-	300		
Heavy Load	132	200	250	375	-	WD400-T3-132G	Rack Size 8
Light Load	160	250	310	-	372		
Heavy Load	160	250	310	465	-	WD400-T3-160G	
Light Load	185	-	340	-	408		
Heavy Load	185	-	340	510	-	WD400-T3-185G	Rack Size 9
Light Load	200	275	380	-	456		
Heavy Load	200	275	380	570	-	WD400-T3-200G	
Light Load	220	300	415	-	498		
Heavy Load	220	300	415	622.5	-	WD400-T3-220G	
Light Load	250	340	470	-	564		
Heavy Load	250	340	470	705	-	WD400-T3-250G	Rack Size 10
Light Load	280	380	510	-	612		
Heavy Load	280	380	510	765	-	WD400-T3-280G	
Light Load	315	430	600	-	720		
Heavy Load	315	430	600	900	-	WD400-T3-315G	Rack Size 11
Light Load	355	485	670	-	804		
Heavy Load	355	485	670	1005	-	WD400-T3-355G	
Light Load	400	545	750	-	900		
Heavy Load	400	545	750	1125	-	WD400-T3-400G	
Light Load	450	600	800	-	960		
Heavy Load	450	600	800	1200	-	WD400-T3-450G	Rack Size 12
Light Load	500	675	860	-	1032		
Heavy Load	500	675	860	1290	-	WD400-T3-500G	
Light Load	560	750	990	-	1188		
Heavy Load	560	750	990	1485	-	WD400-T3-560G	
Light Load	630	850	1100	-	1320		
Heavy Load	630	850	1200	1800	-	WD400-T3-630G	Rack Size 13
Light Load	710	950	1340	-	1608		
Heavy Load	710	950	1340	2010	-	WD400-T3-710G	
Light Load	800	1080	1500	-	1800		
Heavy Load	800	1080	1500	2250	-	WD400-T3-800G*	Rack Size 14
Light Load	900	1215	1620	-	1944		
Heavy Load	900	1215	1620	2430	-	WD400-T3-900G*	
Light Load	1000	1350	1720	-	2064		
Heavy Load	1000	1350	1720	2850	-	WD400-T3-1000G*	

Note: Models marked with "*" are in development.

Power Supply Voltage: Three-Phase 660V ~ 690V 50/60Hz

Motor			AC Drive (Output)			Model	Rack Size
Working Condition	Specified Power		Maximum Continuous Output Current In	Maximum Instantaneous Current 1.5In (Heavy Load; 60s)	Maximum Instantaneous Current 1.2In (Light Load; 60s)		
	kW	HP	A	A	A		
Heavy Load	22	30	28	42	-	WD400-T6-022G	Rack Size 6
Light Load	30	40	35	-	42		
Heavy Load	30	40	35	52.5	-	WD400-T6-030G	Rack Size 6
Light Load	37	50	45	-	54		
Heavy Load	37	50	45	67.5	-	WD400-T6-037G	
Light Load	45	60	52	-	62		
Heavy Load	45	60	52	78	-	WD400-T6-045G	Rack Size 6
Light Load	55	75	63	-	76		
Heavy Load	55	75	63	94.5	-	WD400-T6-055G	
Light Load	75	100	86	-	103		
Heavy Load	75	100	86	129	-	WD400-T6-075G	
Light Load	90	125	98	-	118		
Heavy Load	90	125	98	147	-	WD400-T6-090G	Rack Size 7
Light Load	110	150	121	-	145		
Heavy Load	110	150	121	181.5	-	WD400-T6-110G	
Light Load	132	200	150	-	180		
Heavy Load	132	200	150	225	-	WD400-T6-132G	Rack Size 8
Light Load	160	250	175	-	210		
Heavy Load	160	250	175	262.5	-	WD400-T6-160G	
Light Load	185	-	198	-	238		
Heavy Load	185	-	198	297	-	WD400-T6-185G	Rack Size 9
Light Load	200	275	218	-	262		
Heavy Load	200	275	218	327	-	WD400-T6-200G	
Light Load	220	300	235	-	282		
Heavy Load	220	300	235	352.5	-	WD400-T6-220G	
Light Load	250	340	270	-	324		
Heavy Load	250	340	270	405	-	WD400-T6-250G	Rack Size 10
Light Load	280	380	330	-	396		
Heavy Load	280	380	330	495	-	WD400-T6-280G	
Light Load	315	430	345	-	414		
Heavy Load	315	430	345	517.5	-	WD400-T6-315G	Rack Size 11
Light Load	355	485	380	-	456		
Heavy Load	355	485	380	570	-	WD400-T6-355G	

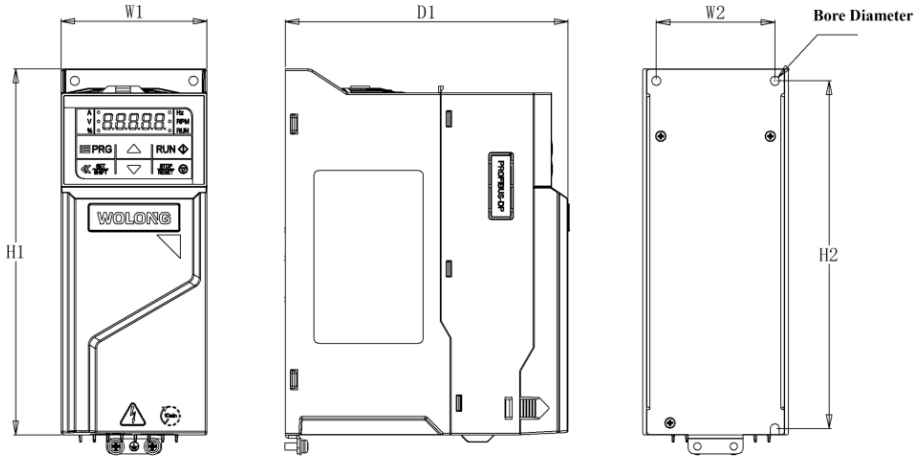
Light Load	400	545	430	-	516		
Heavy Load	400	545	430	645	-	WD400-T6-400G	
Light Load	450	600	466	-	559		
Heavy Load	450	600	466	699	-	WD400-T6-450G	Rack Size 12
Light Load	500	675	540	-	648		
Heavy Load	500	675	540	810	-	WD400-T6-500G	
Light Load	560	750	600	-	720		
Heavy Load	560	750	600	900	-	WD400-T6-560G	
Light Load	630	850	690	-	828		
Heavy Load	630	850	690	1035	-	WD400-T6-630G	Rack Size 13
Light Load	710	950	760	-	912		
Heavy Load	710	950	760	1140	-	WD400-T6-710G	
Light Load	800	1080	860	-	1032		
Heavy Load	800	1080	860	1290	-	WD400-T6-800G*	Rack Size 14
Light Load	900	1215	932	-	1118		
Heavy Load	900	1215	932	1398	-	WD400-T6-900G*	
Light Load	1000	1350	1040	-	1248		
Heavy Load	1000	1350	1040	1560	-	WD400-T6-1000G*	

Note: Models marked with "*" are in development.

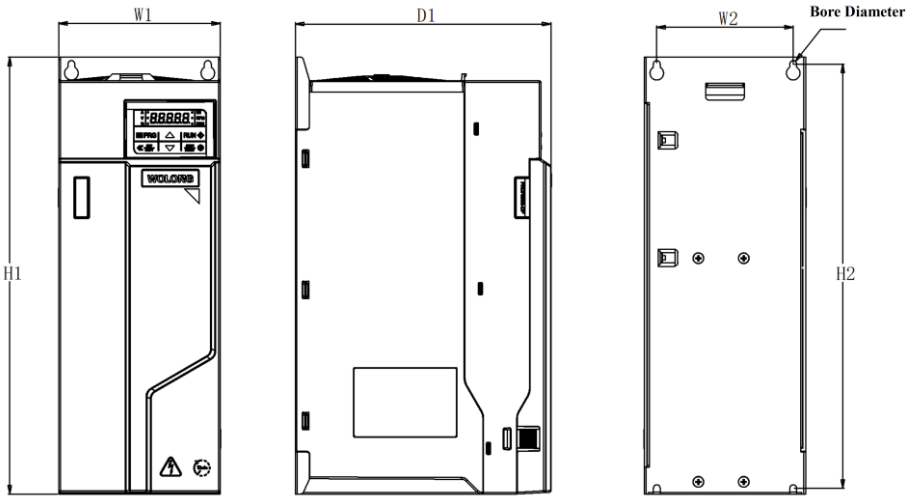
4. Installation

4.1 Installation Dimensions

Rack Size 1



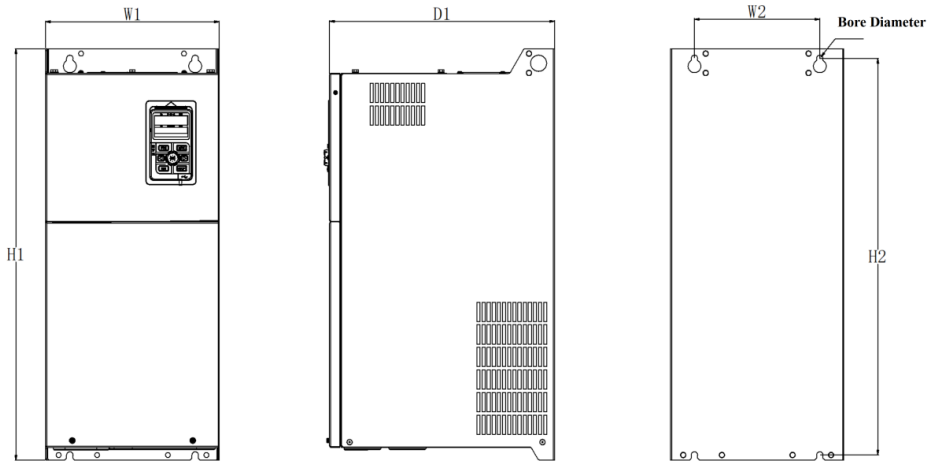
Rack Sizes 2 ~ 5



Rack Size	Outline Dimensions (mm/inch)			Installation Dimensions (mm/inch)		
	W1	D1	H1	W2	H2	Bore Diameter
Rack Size 1	80/3.15	155/6.1	200/7.87	65/2.56	190/7.48	3-⌀5/0.2
Rack Size 2	100/3.94	155/6.1	242/9.53	84/3.31	232/9.13	4-⌀5/0.2

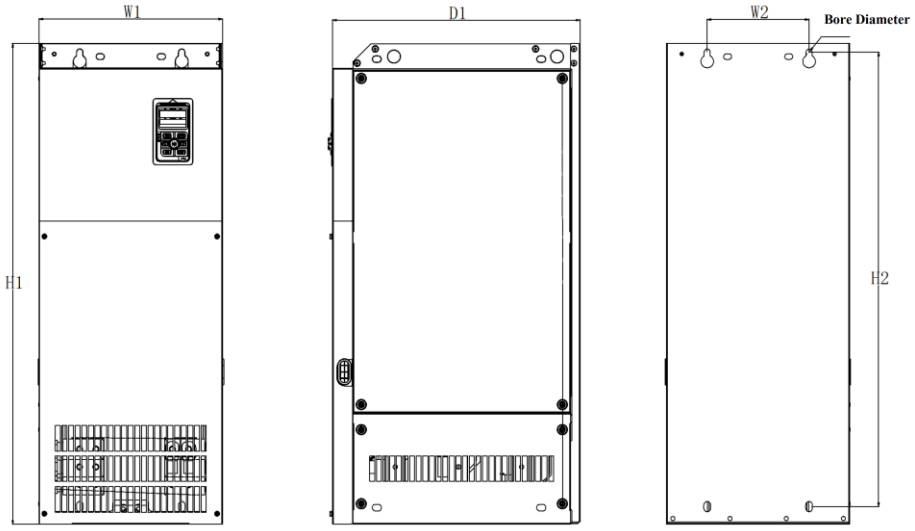
Rack Size 3	116/4.57	175/6.89	320/12.6	98/3.86	308/12.13	4-⌀6/0.24
Rack Size 4	142/5.59	225/8.86	383/15.08	120/4.72	372/14.65	4-⌀6/0.24
Rack Size 5	170/6.69	225/8.86	430/16.93	150/5.91	416/16.38	4-⌀6.5/0.26

Rack Sizes 6 ~ 8



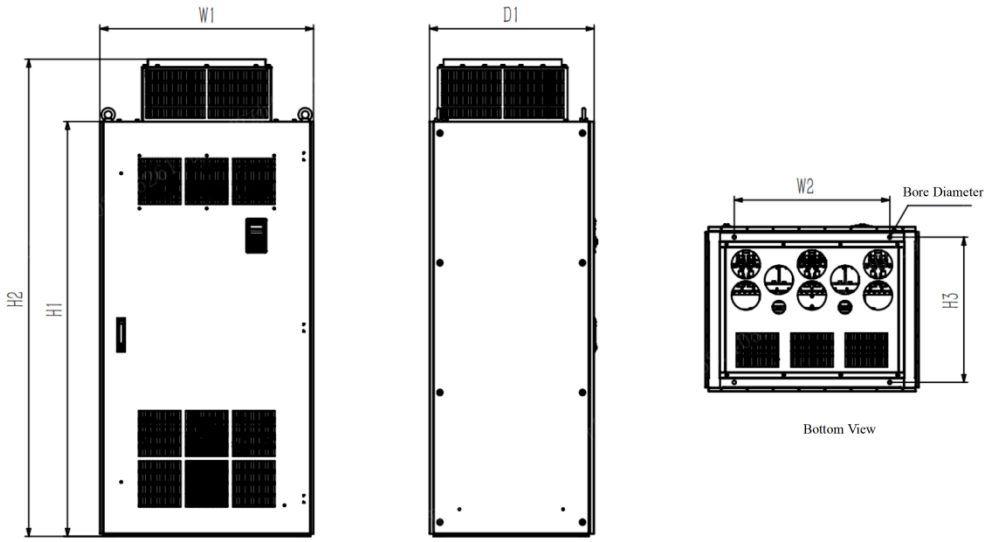
Rack Size	Outline Dimensions (mm/inch)			Installation Dimensions (mm/inch)		
	W1	D1	H1	W2	H2	Bore Diameter
Rack Size 6	240/9.45	310/12.20	560/22.05	176/6.93	545/21.46	4-⌀7/0.28
Rack Size 7	270/10.63	350/13.78	638/21.12	195/7.68	615/24.21	4-⌀10/0.39
Rack Size 8	350/13.78	390/15.35	735/28.94	220/8.66	715/28.15	4-⌀10/0.39

Rack Sizes 9 ~ 12



Rack Size	Outline Dimensions (mm/inch)			Installation Dimensions (mm/inch)		
	W1	D1	H1	W2	H2	Bore Diameter
Rack Size 9	360/14.17	485/19.10	942/37.09	200/7.87	890/35.04	4-⌀12/0.47
Rack Size 10	370/15.57	545/21.46	1127/44.37	200/7.87	1075/43.32	4-⌀15/0.79
Rack Size 11	400/15.75	545/21.46	1212/47.72	240/9.45	1147/45.16	4-⌀20/0.79
Rack Size 12	460/18.11	545/21.46	1400/55.12	300/11.81	1340/52.76	4-⌀20/0.79

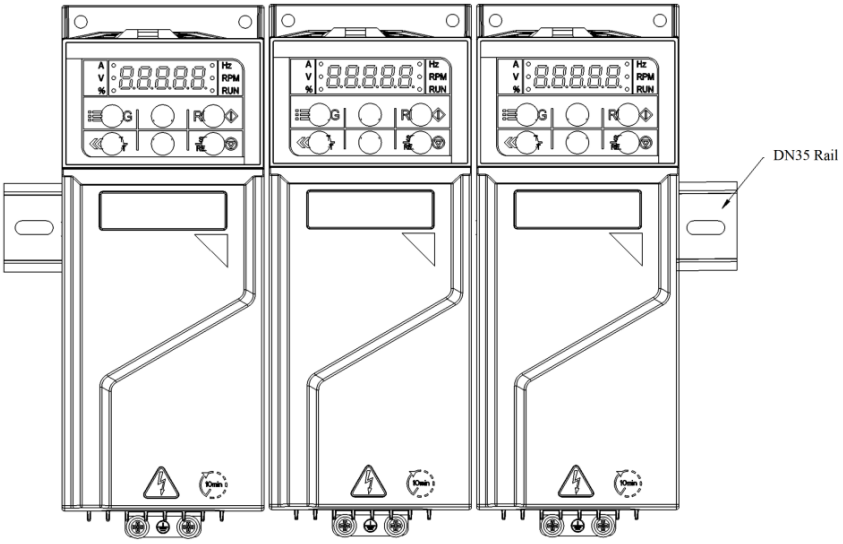
Rack Size 13



Rack Size	Outline Dimensions (mm/inch)			Installation Dimensions (mm/inch)			
	W1	D1	H1	H2	W2	H3	Bore Diameter
Rack Size 13	824/32.44	635/25.00	1600/62.99	1840/72.44	600/23.62	560/22.05	4-⌀14/0.55

4.2 Installation Types

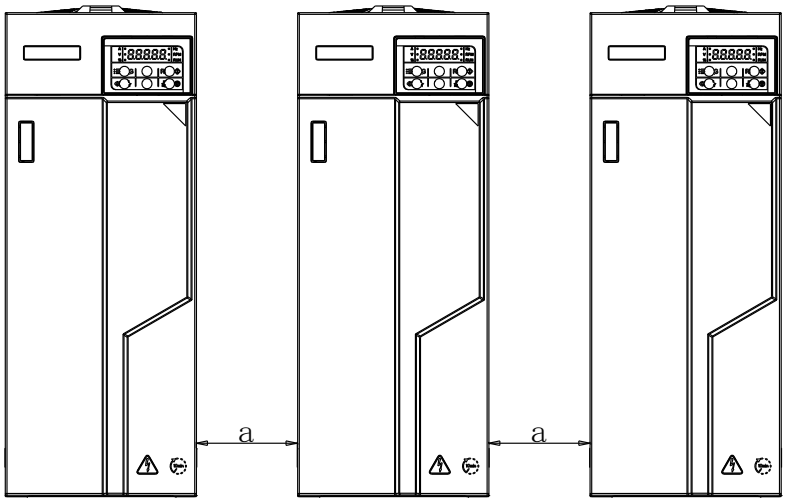
DIN Rail Mounting



Rack Size 1: DIN rail mounting supported

(if a DP communication card is mounted accordingly, make sure to leave sufficient space for the DP connector to be inserted on the left side of the AC drive).

Wall Mounting – Independent Installation



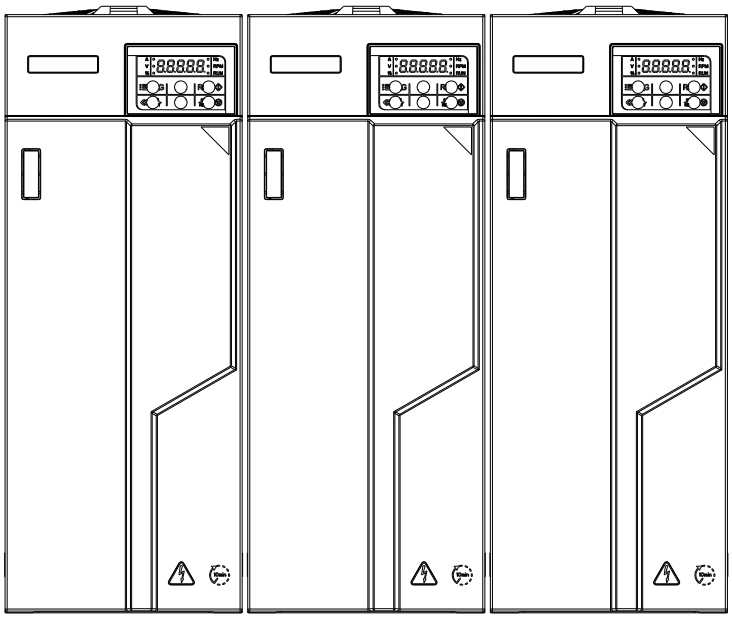
Rack Sizes 1 ~ 5: No clearance is required

(if a DP communication card is mounted accordingly, make sure to leave sufficient space for the DP connector to be inserted on the left side of the AC drive).

Rack Sizes 6 ~ 8: a≥50mm

Rack Sizes 9 ~ 12: No clearance is required

Wall Mounting – Parallel Installation



Rack Sizes 1 ~ 5: Parallel installation supported

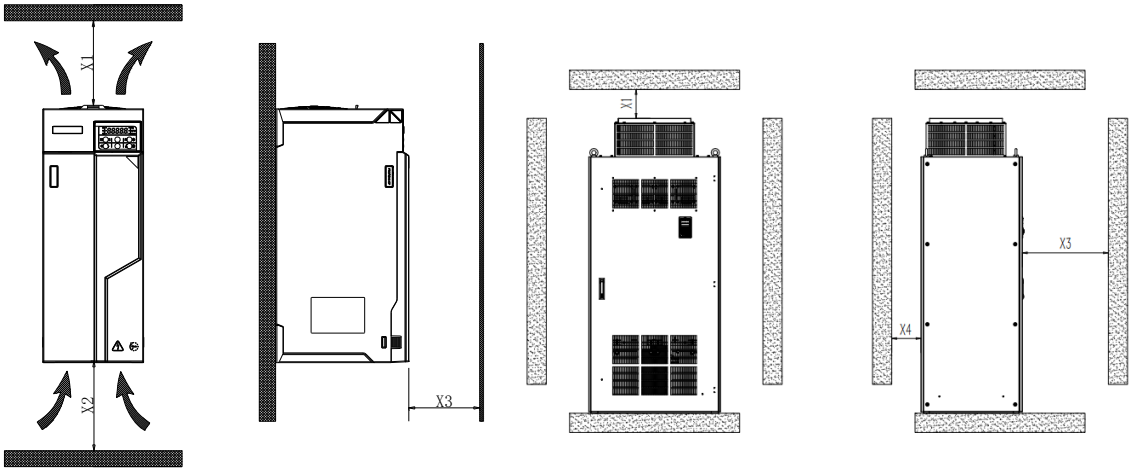
(if a DP communication card is mounted accordingly, make sure to leave sufficient space for the DP connector to be inserted on the left side of the AC drive).

Rack Sizes 6 ~ 8: Parallel installation not supported

Rack Sizes 9 ~ 12: Parallel installation supported

4.3 Installation Requirements

4.3.1 Space Requirements



Rack Size 1-12 Rack Size 13

Rack Size	X1	X2/X4	X3
1 ~ 4	≥100 mm	≥50 mm	≥10 mm
5	≥200 mm	≥100 mm	≥10 mm
6 ~ 8	≥300 mm	≥150 mm	≥10 mm
9 ~ 11	≥250 mm	≥120 mm	≥10 mm
12	≥250 mm	≥120 mm	≥10 mm
13	≥250mm	≥100mm	≥800mm

X1: Free space at the top
X2: Free space at the bottom
X3: Free space in the front
X4: Free space at the back

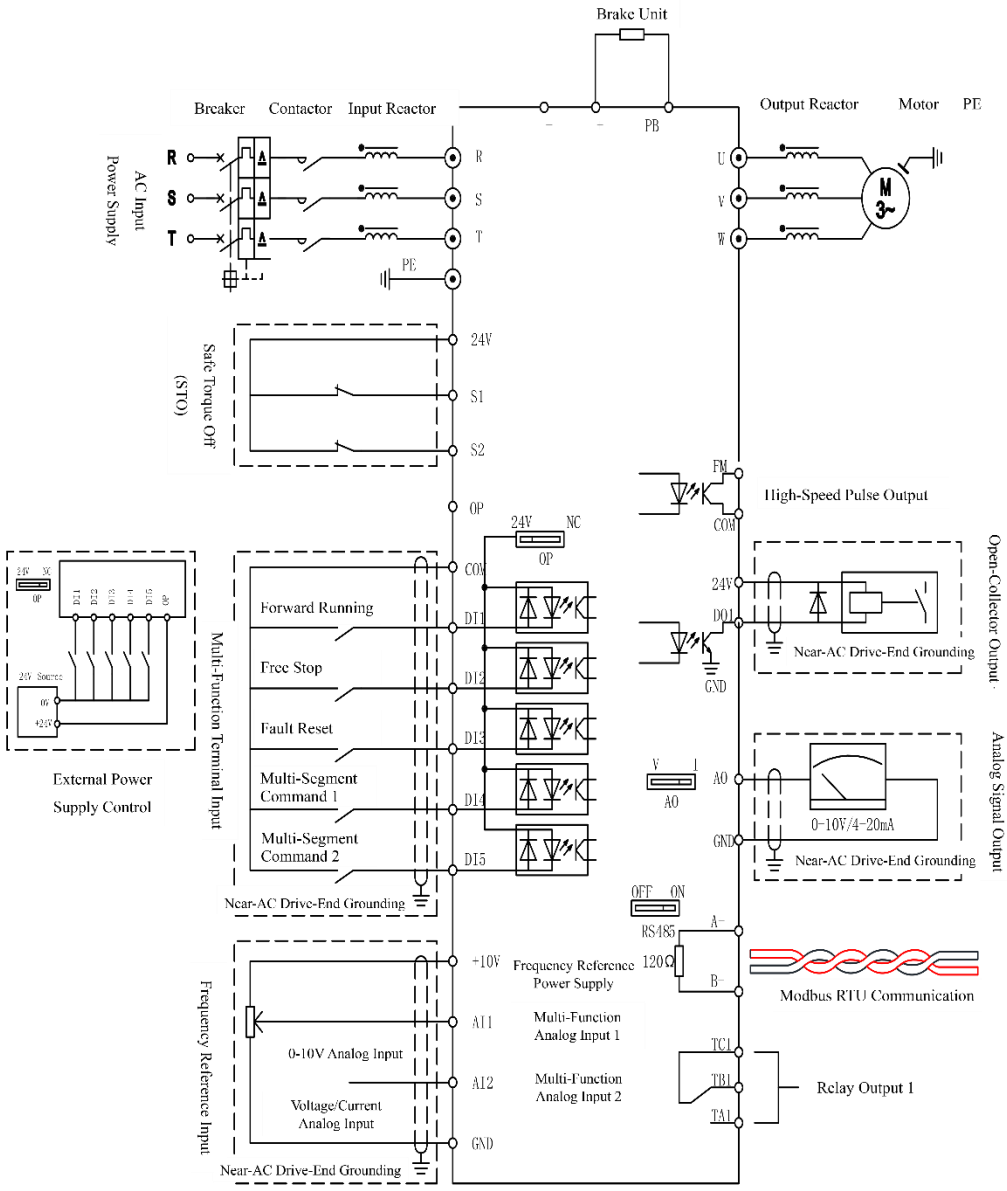
4.3.2 Minimum Airflow Required for Cooling (In-Cabinet Installation)

Rack Size	Min. Airflow m^3/min (CFM)	Rack Size	Min. Airflow m^3/min (CFM)
1	1.1 (39)	7	11.5 (406)
2	1.8 (64)	8	18.5 (653)
3	3.2 (113)	9	23 (812)
4	5 (177)	10	32 (1130)
5	6.8 (240)	11	36 (1271)
6	9 (318)	12	

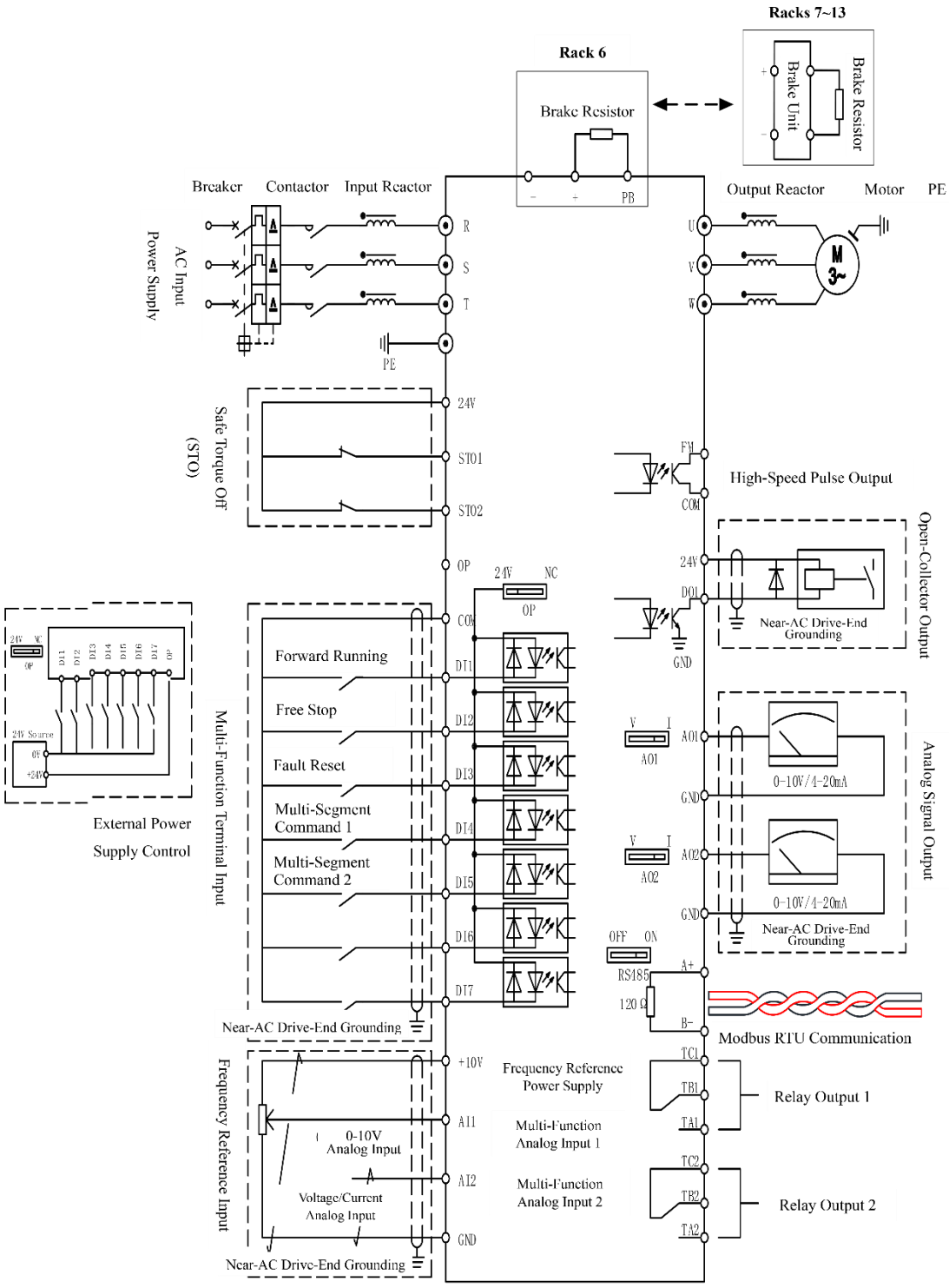
5. Wiring

5.1 Electrical Wiring Diagram

Typical Wiring Diagram for Rack Sizes 1 ~ 5



Typical Wiring Diagram for Rack Sizes 6 ~ 14



Note: Rack Sizes 9 ~ 14 are not provided with a "PB" terminal.

5.2 Pre-Wiring Inspection

5.2.1 Power Supply

• Do not perform wiring with the power supply connected. Ensure that all circuit breakers are in the OFF position. Otherwise, there is a risk of electric shock.

• After disconnecting the power supply on both the input and output sides, wait for 15 minutes until the power indicator light is completely off before starting work.

• The user is responsible for complying with recognized technical regulations and local regulations in their country when installing and connecting motors, cabinet equipment, and other components. Pay particular attention to regulations concerning cable size, fuses, grounding, circuit breaking, isolation, and overcurrent protection.

• If the fuse on the current branch trips, the fault current may have been interrupted. To reduce the risk of fire and electric shock, inspect the conductive parts and other components of the equipment and replace any damaged parts. After the fuse trips, identify and eliminate the cause of the trip.

5.2.2 Grounding

• To prevent electric shock, ensure that the grounding terminal is properly grounded. Follow the relevant electrical codes and regulations of your country or region for grounding methods.

• To prevent electric shock, confirm that the protective grounding conductor meets technical specifications and local safety standards, and keep the grounding wire as short as possible. The leakage current of this product will exceed 3.5mA. Therefore, according to EN 61800-5-1 standards, use a copper wire with a minimum cross-sectional area of 10mm² for the protective grounding conductor, or use two conductors of the same specification.

• When using multiple devices, follow the instructions for grounding all devices.

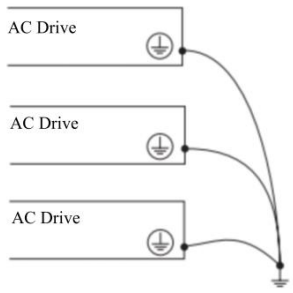
• This product has a VDR selectable grounding screw. During insulation resistance testing, ensure that the VDR selectable grounding screw is disconnected before testing. Otherwise, there is a risk that the test may fail.

⚠ DANGER
Electric Shock Hazard Ground the AC drive according to the grounding connection points provided below. The drive must be properly grounded before powering on. Failure to follow these instructions will result in death or serious injury.

Ensure that the resistance to the protective ground is 1Ω or less.

Connect AC drives to the protective ground according to the diagram.

Do not connect protective ground cables in a loop or series.



⚠ WARNING

Incorrect Wiring

• Applying input line voltage to the output end (U, V, W) will damage the AC drive.

• Check the power supply connection before powering on the AC drive.

• When replacing the existing drive with a WD400 drive, ensure that all wires connected to the WD400 drive comply with all wiring instructions in this Guide.

Failure to follow the usage instructions can lead to death or serious injury.

5.2.3 Others

• Do not use surge protectors or power factor correction capacitors on the AC drive output.
• For the selection of residual current protection devices: The leakage current of the inverter is relatively high. When adding residual current protection at the front end, it is recommended to choose a device with a leakage current protection rating of 30mA or higher.

5.3 Wiring Requirements

5.3.1 General rules

• The power input cables of the inverter and the motor cables generate strong electromagnetic interference. To avoid electromagnetic interference caused by long-distance parallel wiring between high-interference cables and the control circuit, the main circuit cables and signal cables should be separated by a distance of more than 30 cm during wiring. Common main circuit cables

include input RST lines, output UVW lines, DC bus lines, and braking cables. Signal cables include IO signal lines, communication lines, and encoder lines.

• The cable trays must maintain good connections and grounding. Aluminum cable trays ensure equipotentiality of the equipment. Filters, inverters, and motors should be properly connected to the system (mechanical or apparatus). Ensure proper grounding and electrical contact in the installed parts.

• All power cables should be selected according to the regulations of each country or region and comply with EN 60204-1 and IEC 60364-5-52 standards.

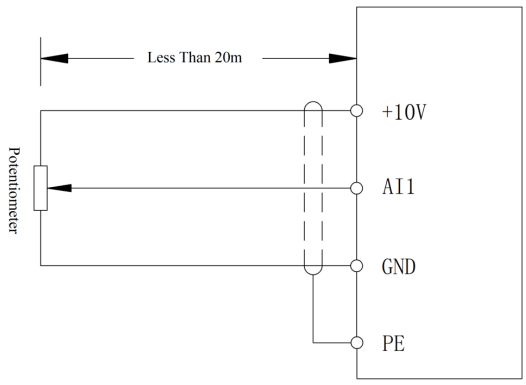
5.3.2 Control Cables

Keep control circuits away from power circuits. Use shielded twisted-pair cables and ground both ends of the cables.

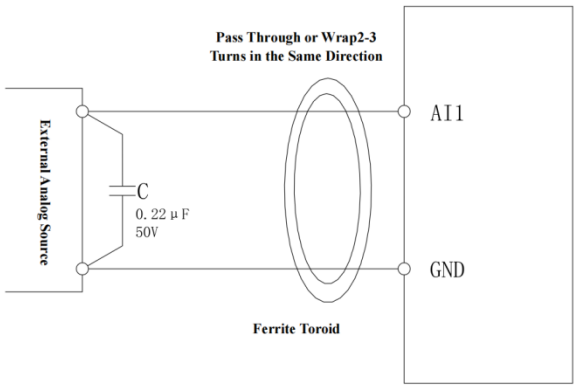
Do not place motor cables, power cables, and control cables in the same conduit. Maintain a minimum distance of 8cm between the metal conduits carrying power cables and control cables. For non-metallic conduits or cable ducts, maintain a minimum distance of 30cm.

Analog Input (AI) Signals:

Use shielded cables for weak analog voltage signals that are highly susceptible, and keep the wiring as short as possible (no longer than 20m).



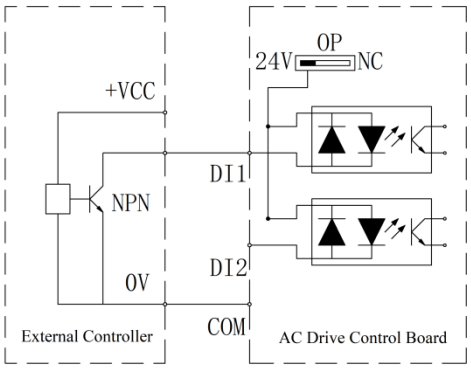
In environments with severe interference, add filter capacitors or ferrite cores at the analog signal source.



Digital Input (DI) Signals:

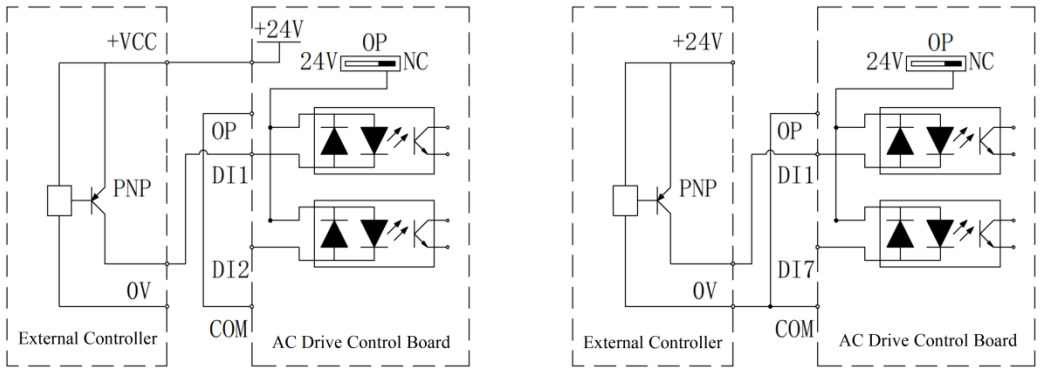
Use shielded cables and keep the wiring as short as possible (no longer than 20m). When using active driving, take necessary filtering measures against power supply crosstalk. It is recommended to use dry contact control.

Sink-Type Wiring:



The diagram shows the internal power supply connection. If using an external power supply, set OP, the DIP switch, to the "NC" end, connect the 24V positive of the external power supply to the OP terminal, and the negative to COM.

Source-Type Wiring:

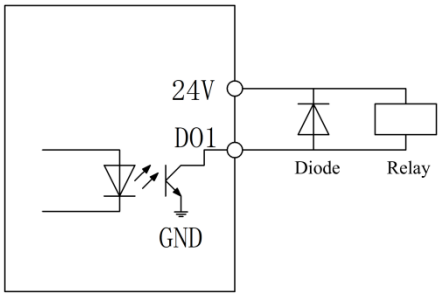


External Power Supply Internal Power Supply

For source-type wiring, set OP, the DIP switch, to the "NC" end, and connect OP to COM.

If using an internal power supply, connect the AC drive's +24V to the external controller's +VCC.
If using an external power supply, connect the external power supply's 0V to COM.

Digital Output (DO) Signals:



When driving relays with digital output terminals, install a snubber diode across the relay coil to prevent damage to the DC 24V power supply.
Note: Pay attention to the polarity of the snubber diode, otherwise, when the digital output terminal has an output, it will burn out the DC 24V power supply.

5.3.3 Motor Cables

When the AC drive operates, the rapid switching of the power-switching transistors can result in a significant dv/dt at the output end. If the motor cable is excessively long, it will lead to substantial voltage stress on the motor windings, potentially causing insulation breakdown. Moreover, as the cable length increases, the distributed capacitance of the cable increases linearly, which facilitates the generation of high-order harmonic currents.
When the motor cable length exceeds 100m, install an output reactor or dv/dt filter on the output end of this product. For more details, please contact Wolong Technical Support.

5.4 EMC Compliance

The EMC product standard (EN 61800-3) specifies the EMC requirements for AC drive products. WD400 Series products comply with the EMC product standard (EN61800-3) for C3 products.

Classification of ENC Application Environments:

Class 1: Civil environments, including those scenarios that are directly connected to the low-voltage power grid for civilian use without intermediate transformers.

Class 2: All environments other than Class 1.

Classification of AC Drives:

C1 AC Drives: Rated voltage below 1000V. Applied in Class 1 environments.

C2 AC Drives: Rated voltage below 1000V. Not intended for plug-in, socket, or mobile use. Must be installed and operated by trained professionals when applied in Class 1 environments.

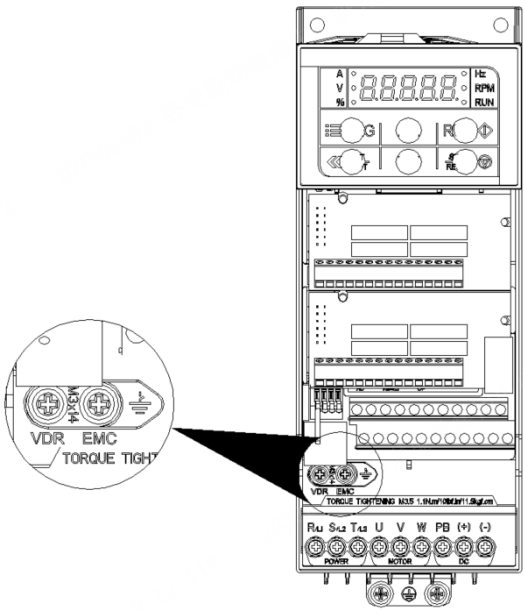
C3 AC Drives: Rated voltage below 1000V. Applied only in Class 2 environments.

C4 AC Drives: Rated voltage above 1000V or rated current≧400A. Applied in complex systems in Class 2 environments.

5.5 Disconnection of EMC Filters

WD400 Series products are equipped with built-in EMC filters. During AC drive operation, there may be current leakage to the ground. If the leakage current causes compatibility issues with the front-end protection devices (such as RCDs or other equipment), the built-in EMC filter can be disconnected to reduce the leakage current as shown below. However, it should be noted that disconnecting the EMC filter will render the AC drive non-compliant with the EMC requirements of the EMC product standard (EN 61800-3).

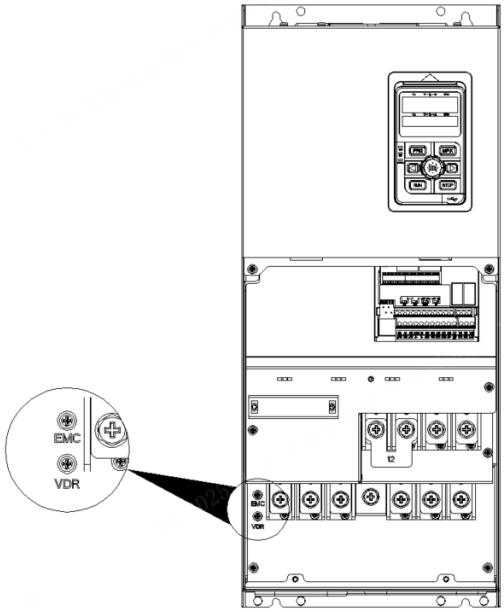
Disconnection Procedures for Rack Sizes 1 ~ 5:



1. Open the lower cover of the AC drive and locate the screw marked with "EMC" (position may vary by model);
2. Loosen the grounding screw marked with "EMC" by 5-10 turns counterclockwise using a Phillips screwdriver to disconnect the EMC filter.

Note: There is no need to completely remove the screw rather than loosen it. Carefully identify the markings. Do not remove the screw marked with "VDR".

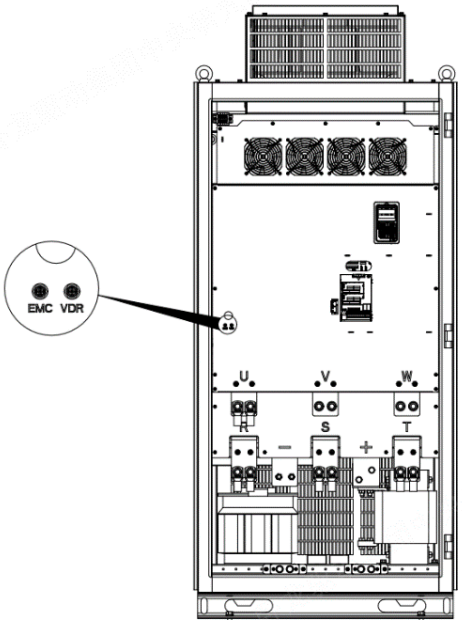
Disconnection Procedures for Rack Sizes 6 ~ 12:



1. Open the lower cover of the AC drive and locate the screw marked with "EMC" (location may vary by model);
2. Remove the grounding screw marked with "EMC";
3. Wrap the EMC grounding terminal with electrical tape to prevent contact with the metal housing.

Note: Carefully identify the markings. Do not remove the screw marked with "VDR".

Disconnection Procedures for Rack Sizes 13:



1. Open the lower cover of the AC drive and locate the screw marked with "EMC" (location may vary by model);
2. Remove the grounding screw marked with "EMC";
3. Wrap the EMC grounding terminal with electrical tape to prevent contact with the metal housing.

Note: Carefully identify the markings. Do not remove the screw marked with "VDR".

5.6 Wiring Instructions

5.6.1 Power Terminal Features and Functions

Grounding Terminal	Function
⏚	Protective Grounding
R **S** **T**	POWER AC Power Supply Input
P	DC Bus Positive (+)
(+)	Output to Brake Resistor (+)
(-)	DC Bus Negative (-)
PB	Output to Brake Resistor①
U **V** **W**	MOTOR Output to Motor
①: If needed to connect a brake resistor, please ensure that the "brake unit" option was selected when placing the order.	

Additional Notes:

For Input Power Supply (R, S, T):

• No phase sequence requirement for the input end;

• Wiring specifications and installation of the external main circuit must comply with local regulations and relevant IEC standards;

• Use copper conductors of recommended sizes as main circuit cables.

For DC Bus (+) and (-):

• After powering off, wait at least 10 minutes for the residual voltage on the DC bus (+) and (-) terminals to be eliminated and ensure that the indicators are out before wiring to avoid electric shock hazards;

• Do not reverse the polarity of (+) and (-) terminals when using an external brake component, otherwise, it can cause damage to the equipment and the brake components, and even fire;

• Keep the wiring length of the brake unit within 10m, and use twisted-pair or paralleled cables;

• Do not connect capacitors or surge suppressors to the DC bus, otherwise, it can cause damage to the equipment and even fire.

For Output End (U, V, W):

• Wiring specifications and installations of the external main circuit must comply with local regulations and relevant IEC standards;

• Use copper conductors of recommended sizes as main circuit cables;

• Avoid connecting capacitors or surge absorbers to the output end to prevent frequent protection or damage;

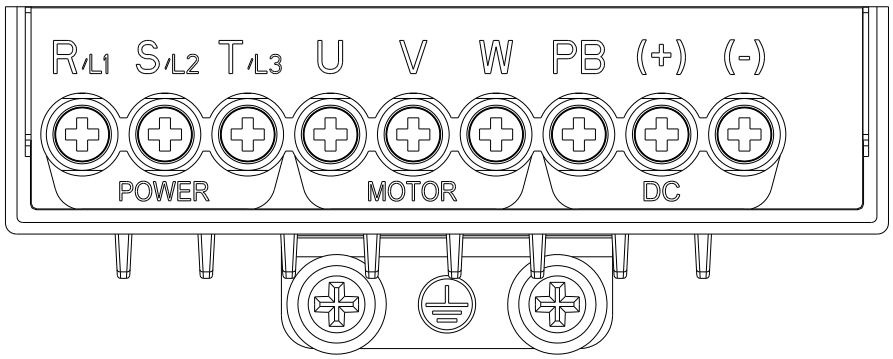
• When the motor cable is excessively long, electrical resonance is prone to occur due to the influence of distributed capacitance, which may lead to motor insulation damage or generate a large leakage current that triggers overcurrent protection of the AC drive. For motor cables longer than 100m, install an AC output reactor near the device to prevent electrical resonance and potential damage.

5.6.2 Power Terminal Wiring Instructions

• Separate and shield power terminals and accessible surfaces to protect the main circuit;
• Keep foreign objects away from the wiring area of the terminal strip;
• Do not solder twisted conductor cables;
• Tighten terminal screws to specified torques using a torque screwdriver, torque ratchet, or torque wrench, as tightening torques of different terminals may vary;
• When using an electric tool, use the low gear setting to tighten terminal screws to prevent damage;
• Do not tighten terminal screws at an angle greater than 5 degrees to prevent damage.

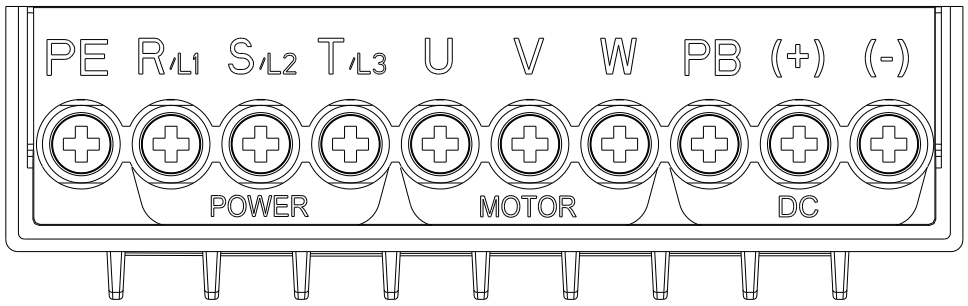
5.6.3 Power Terminal Layout

Rack Size 1



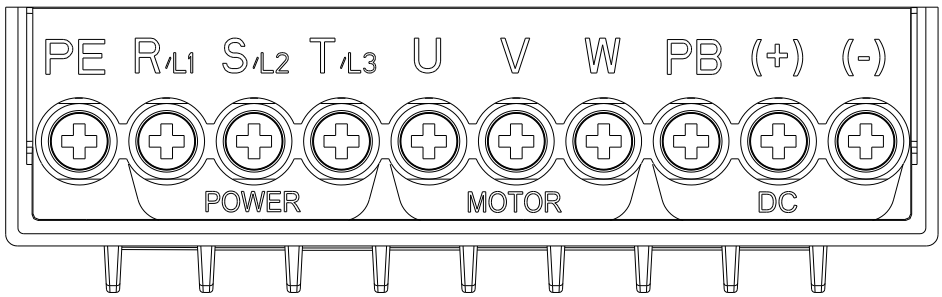
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-R75G-B	0.75	1.1 ~ 1.5
WD400-T3-1R5G-B	0.75	
WD400-T3-2R2G-B	1	

Rack Size 2



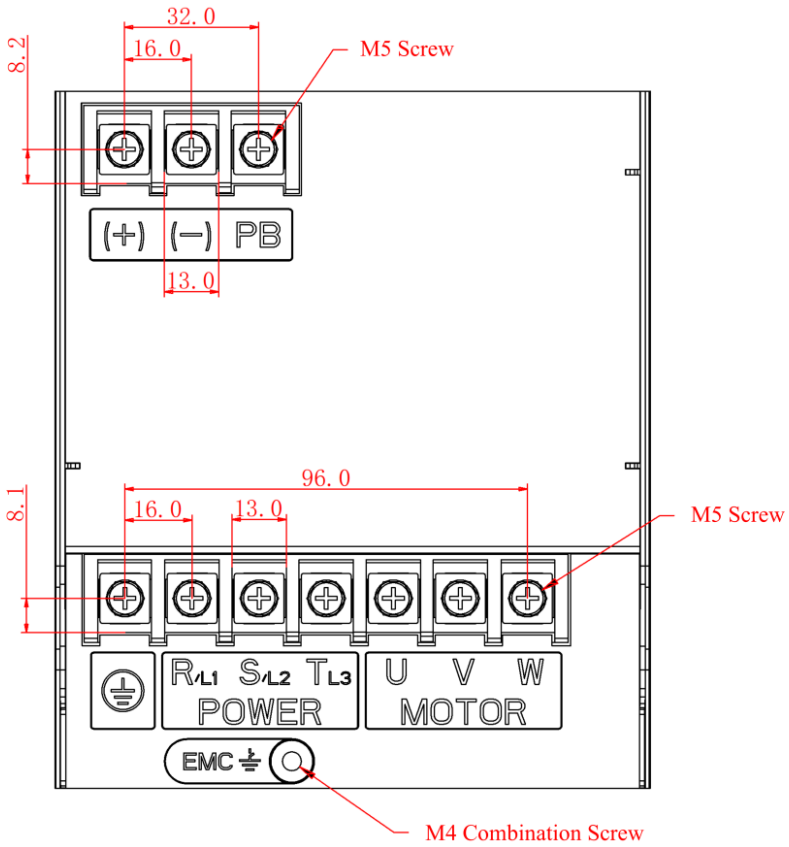
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-004G-B	1.5	1.2 ~ 1.7
WD400-T3-5R5G-B		

Rack Size 3



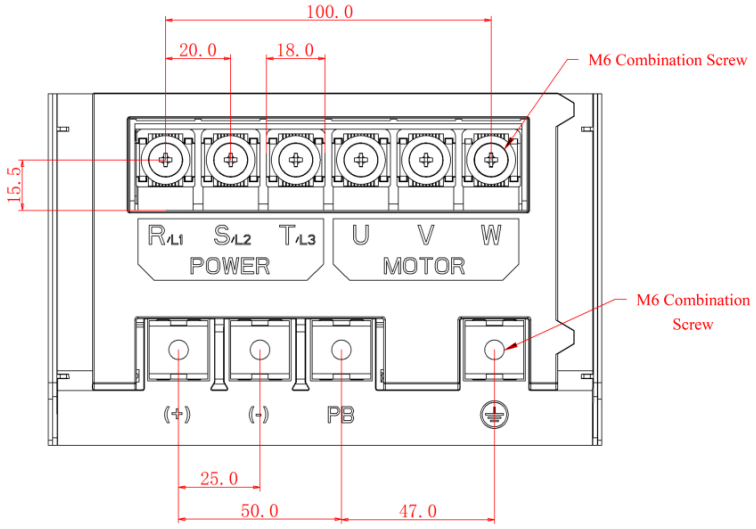
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-7R5G-B	2.5	1.2 ~ 1.7
WD400-T3-011G-B	4	

Rack Size 4



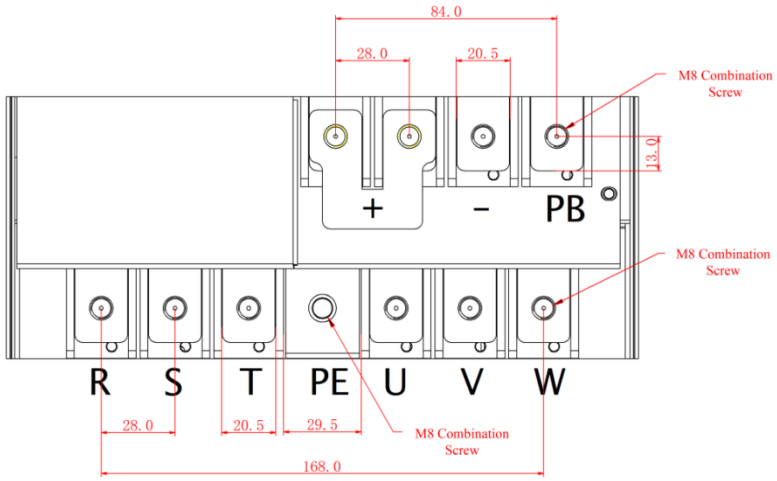
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-015G-B	6	2.5 ~ 3.5
WD400-T3-018G-B	10	
WD400-T3-022G-B	10	

Rack Size 5



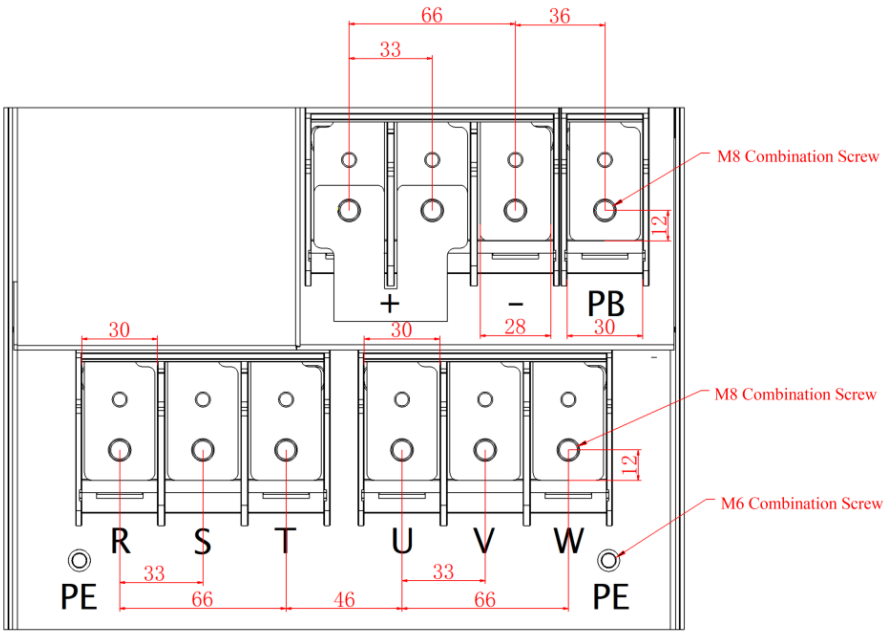
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-030G	16	4 ~ 6
WD400-T3-037G	25	

Rack Size 6



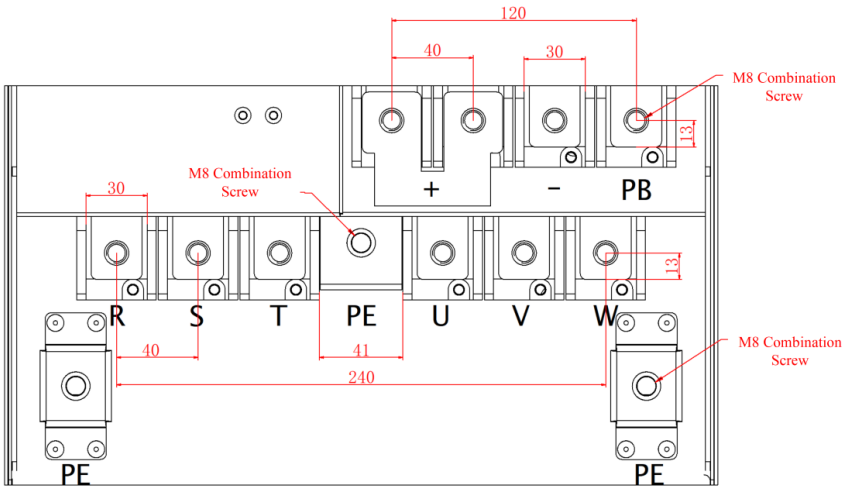
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-045G	25	9 ~ 11
WD400-T3-055G	35	
WD400-T3-075G	50	

Rack Size 7



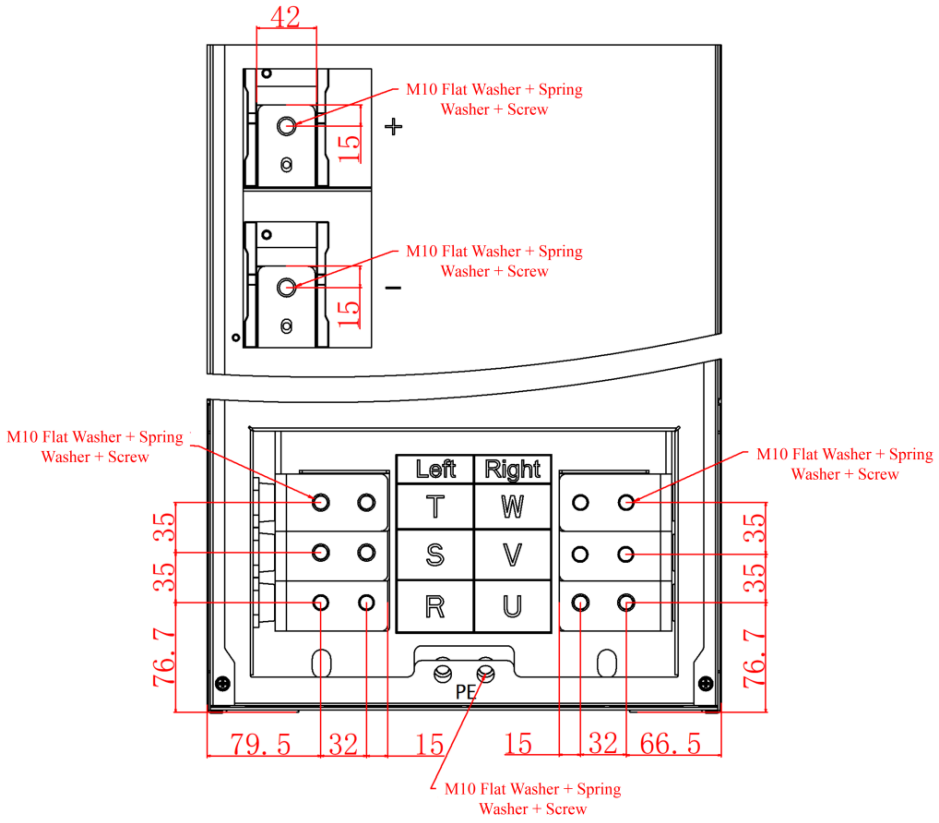
Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-090G	70	9 ~ 11
WD400-T3-110G	95	

Rack Size 8

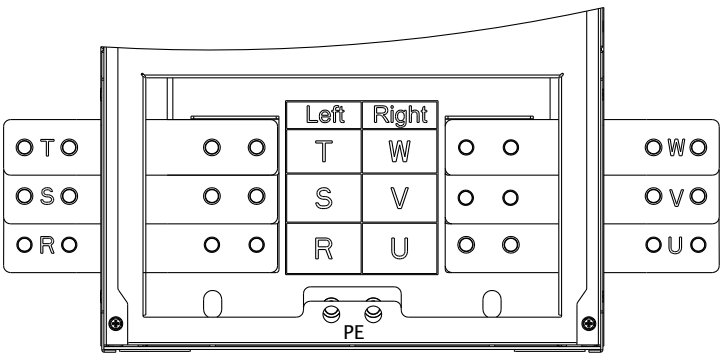


Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-132G	95	9 ~ 11
WD400-T3-160G	150	

Rack Size 9

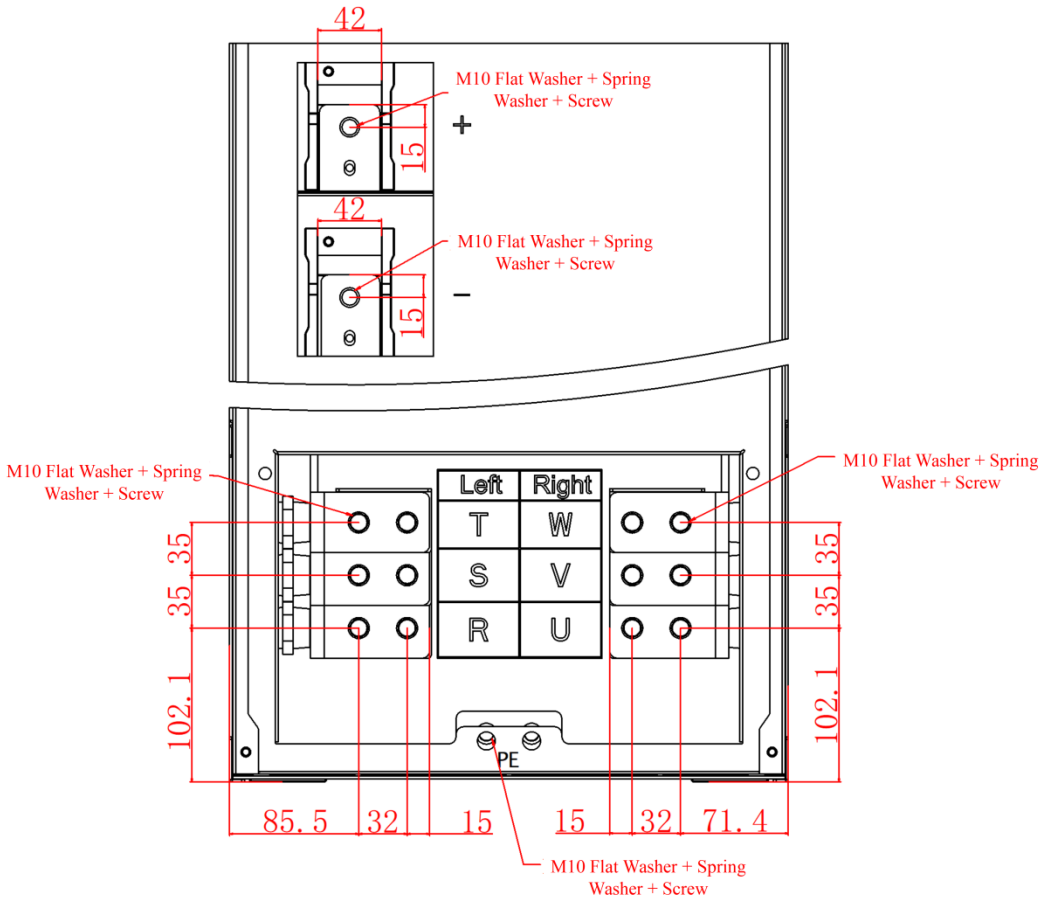


Through optional accessories, rotate the incoming copper bar (R, S, T) and outgoing cooper bar (U, V, W) outward to the two sides of the AC drive, as shown below.

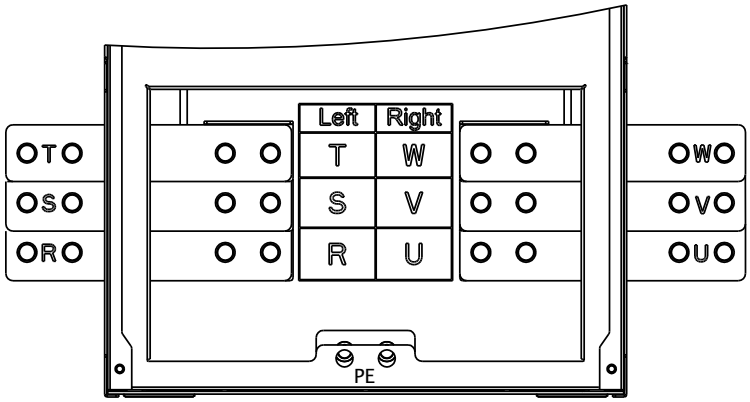


Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-185G	2x70	18 ~ 23
WD400-T3-200G	2x95	
WD400-T3-220G	2x95	

Rack Size 10

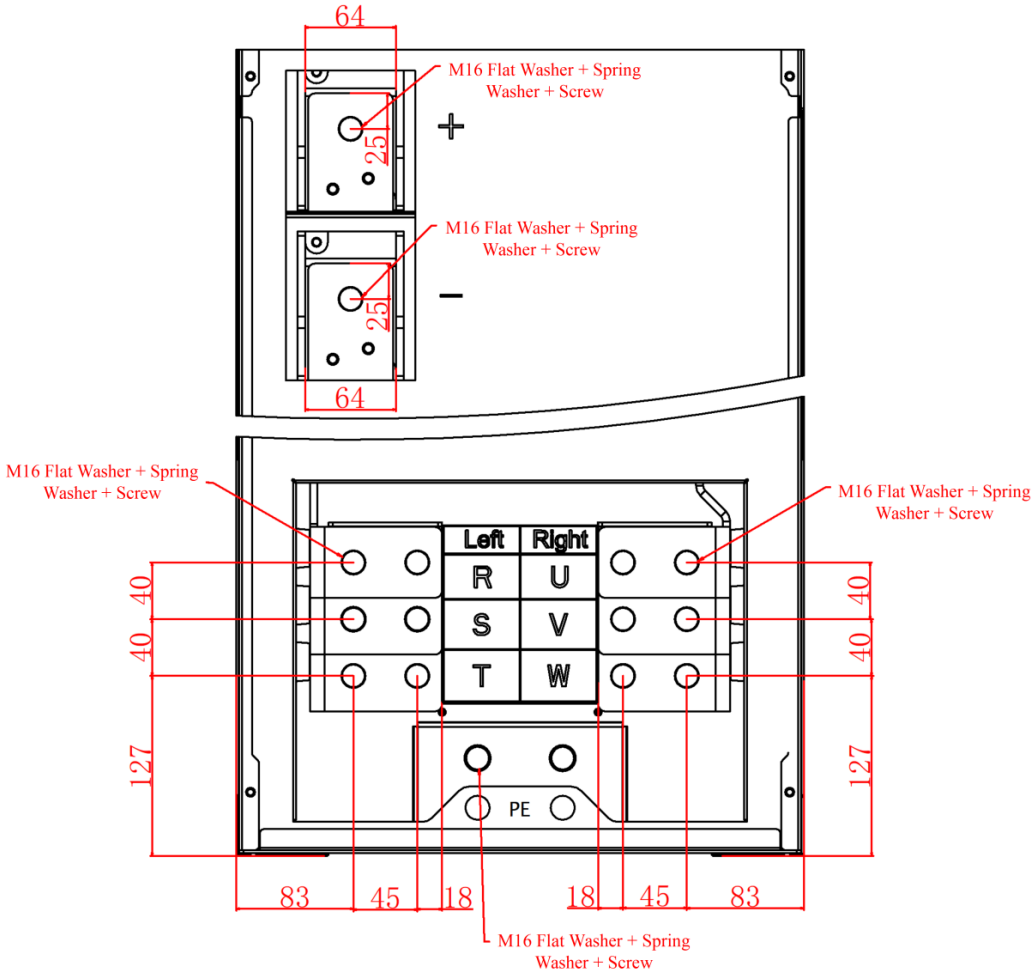


Through optional accessories, rotate the incoming copper bar (R, S, T) and outgoing cooper bar (U, V, W) outward to the two sides of the AC drive, as shown below.

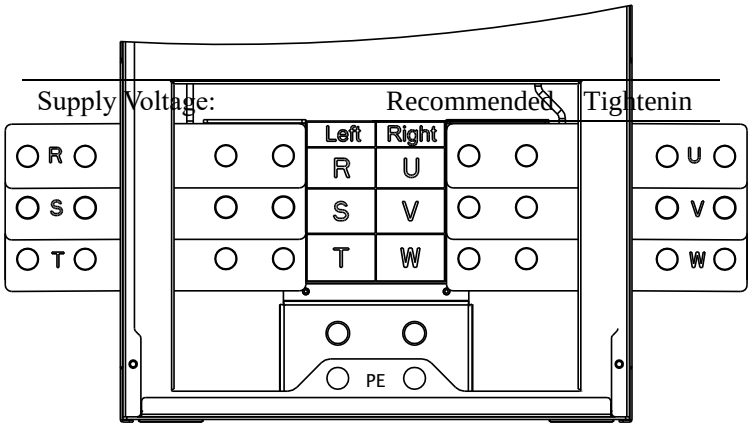


Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-250G	2x120	18 ~ 23
WD400-T3-280G	2x150	

Rack Size 11

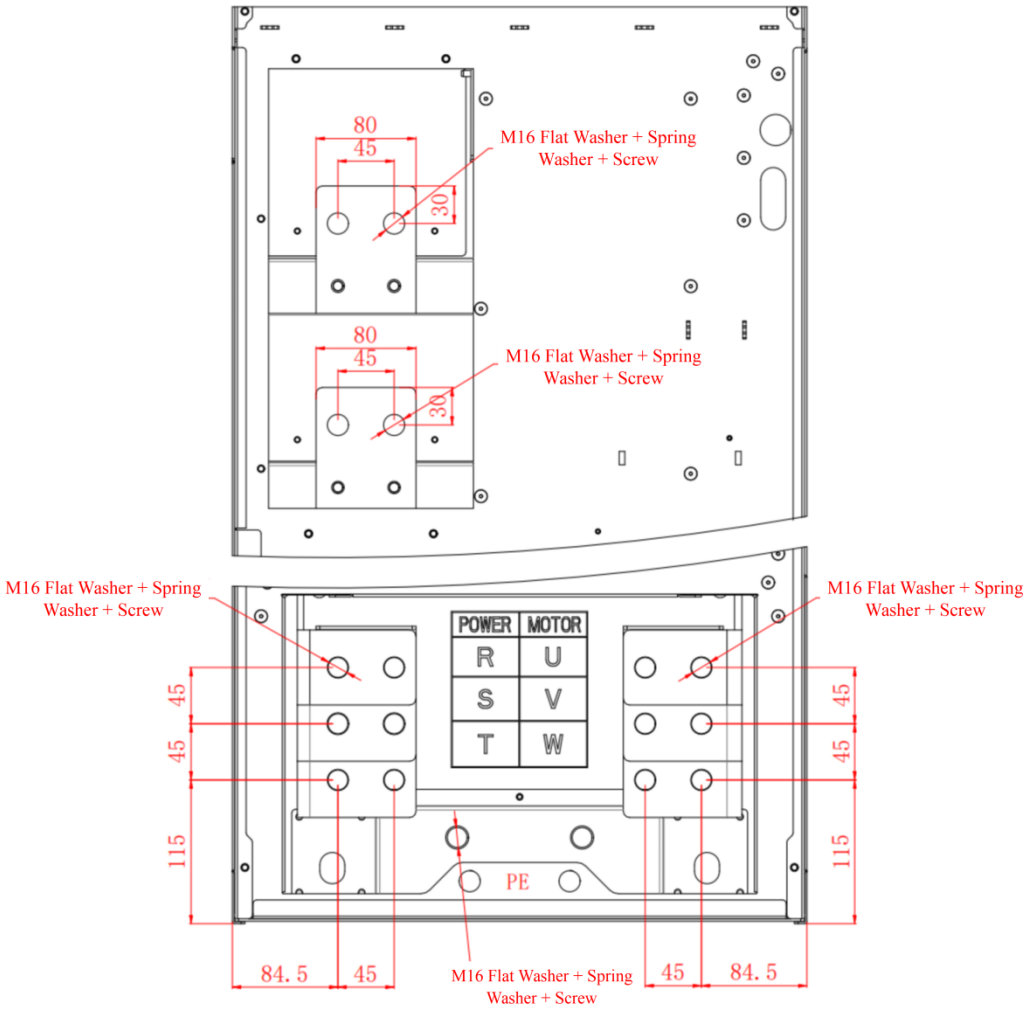


Through optional accessories, rotate the incoming copper bar (R, S, T) and outgoing cooper bar (U, V, W) outward to the two sides of the AC drive, as shown below.

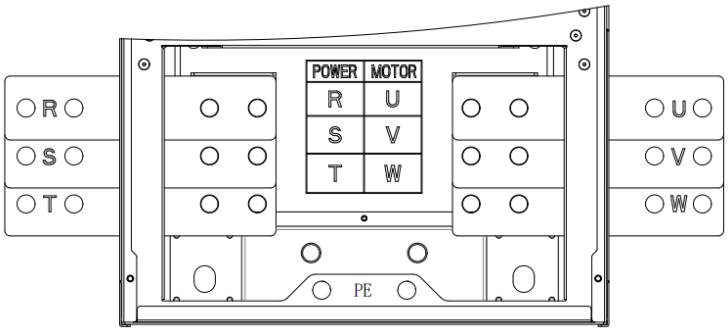


Three-Phase 380V ~ 480V	Wire Size	g Torque
	mm²	N.m
WD400-T3-315G	2x150	25 ~ 35
WD400-T3-355G	2x185	
WD400-T3-400G	2x240	

Rack Size 12

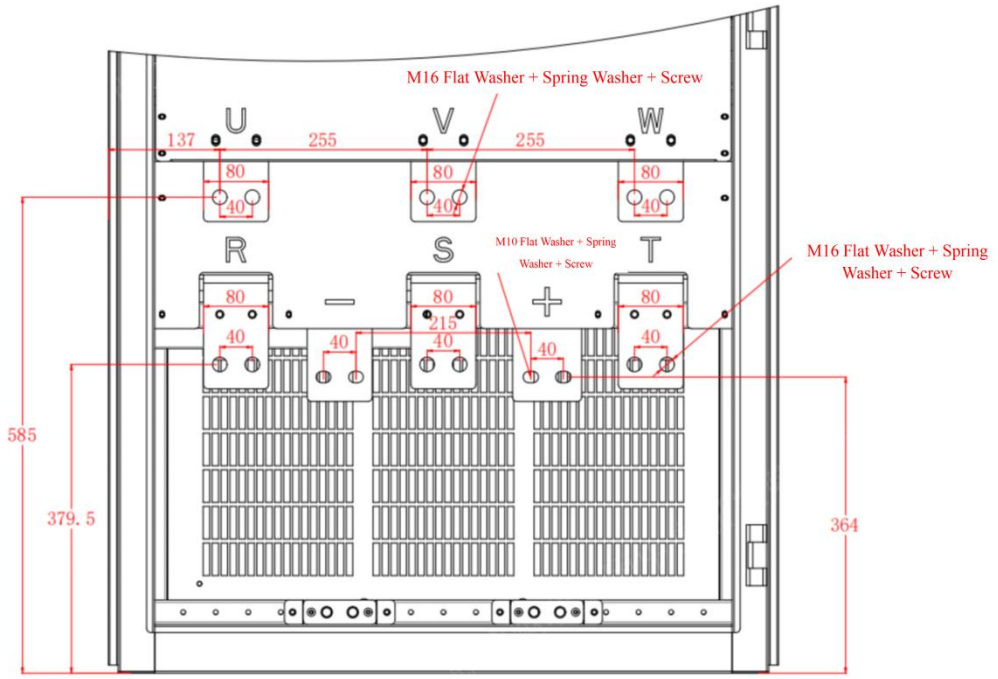


Through optional accessories, rotate the incoming copper bar (R, S, T) and outgoing cooper bar (U, V, W) outward to the two sides of the AC drive, as shown below.



Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-450G	2x240	25 ~ 35
WD400-T3-500G	2x240	
WD400-T3-560G	2x240	

Rack Size 13



Supply Voltage: Three-Phase 380V ~ 480V	Recommended Wire Size	Tightening Torque
	mm²	N.m
WD400-T3-630G	4x185	25 ~ 35
WD400-T3-710G	4x185	

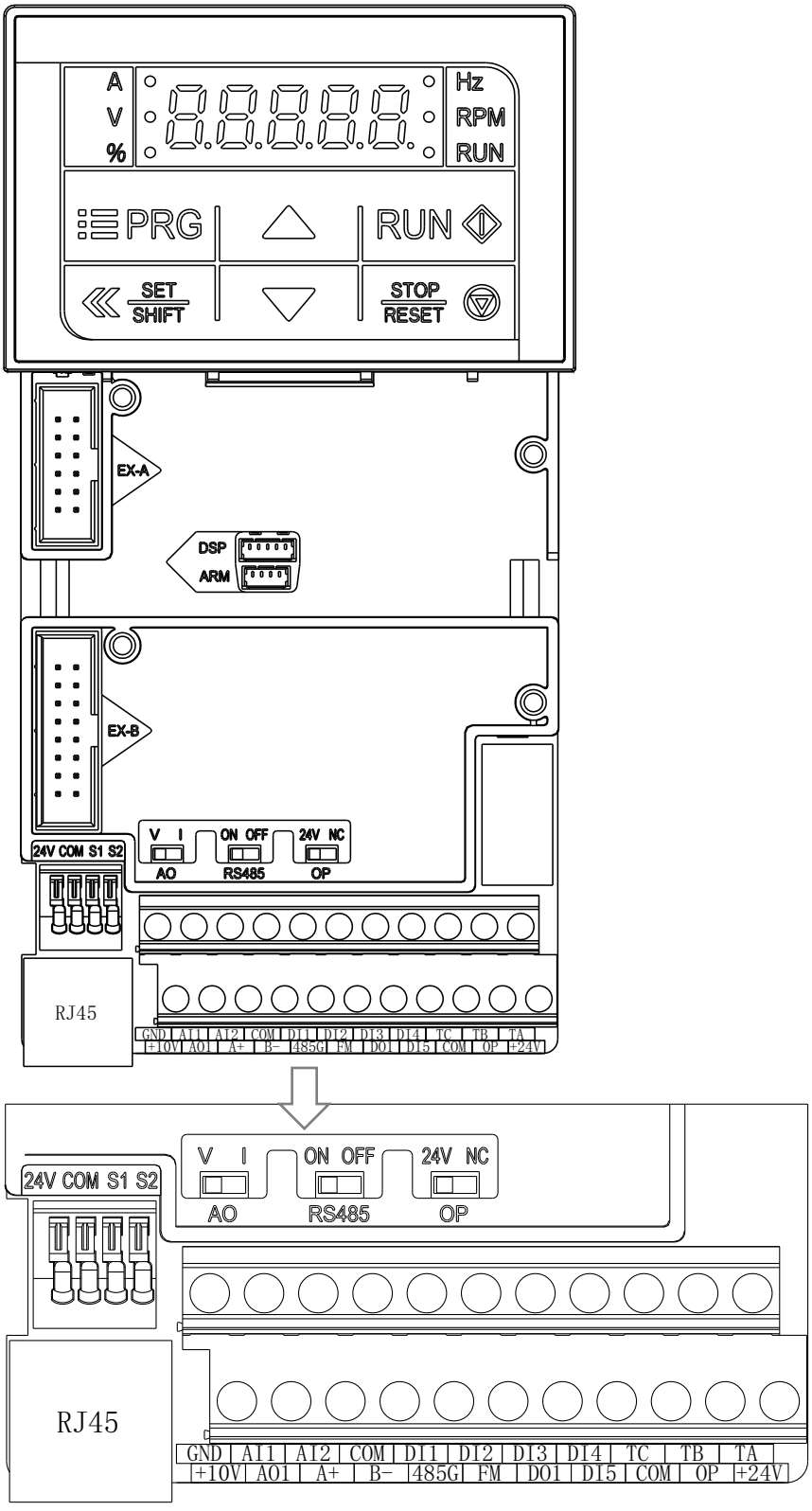
5.6.4 Control Terminal Features and Functions

Terminal	Function	Electrical Specification
GND	+10V DC Power Supply Zero Potential Reference For Analog Input/Output (I/O)	0V
10V	+10V DC Potentiometer Power Supply	•+10V（10.5V±0.5V） •10mA (Max) •1kΩ ~ 10kΩ
AO1 AO2	Analog Outputs Voltage or Current	• Analog Voltage Output: 0 ~ +10V DC; Load Impedance > 50kΩ • Analog Current Output: 0-20mA or 4-20mA (selectable via the DIP switch); Maximum Load Impedance: 500Ω
AI1 AI2	Analog Inputs Voltage or Current	• Analog Voltage Input: 0-10V DC; Input Impedance: 100KΩ • Analog Current Input: 0-20mA or 4-20mA (selectable via the DIP switch); Input Impedance: 500Ω
A+ B-	Modbus RTU Communication	Standard Modbus RTU (485) Communication Interface, with twisted pair or shielded cables
485G	RS485 CAN Shield	Ground point for RS485 communication cable shielding layer
COM	+24V DC Power Supply Zero Potential Reference For Digital Input/Output (I/O)	0V
DI1 ~ DI7	Programmable Digital Inputs	• Internal Impedance: 4.4KΩ • +24V DC (Allowed Voltage: 16.8V-31.2V) • Maximum Input Frequency: 1kHz • Response Time: 1ms ± 0.5ms
OP	External OP Control Input Power Supply	• Connect External +24V DC to OP for controlling DI signals • When using external power supply control, set the OP DIP switch to NC
DO1	Open-Collector Programmable Logic Output	•+24V DC (or up to 30V) • Maximum Internal Power Supply Current: 1.2mA • Maximum External Power Supply Current: 200mA • Response Time: 5ms±1ms
FM	High-Speed Pulse Output or Open-Collector Output	Set via Parameter F03-00 (FM Terminal Output Mode Selection): As high-speed pulse output, the maximum frequency is 100kHz; As open-collector output, the maximum voltage is 20V, and the maximum current of the external power supply is 16mA.
+24V OUT	External +24V DC Output Power Supply	+24V DC Power Supply; Maximum Output Current: 100mA Used as a power supply for digital I/O terminals and external sensors
TC1/CM1 TB1/NC1 TA1/NO1	Programmable Relay Outputs NC/NO Contacts	• Minimum Switching Capacity: 16.7mA at 24V DC • Maximum Switching Capacity for Resistive Loads: NO/NC-5A/3A 240VAC, NO/NC-7A/3A 120VAC • Response Time: 5ms • Service Life: 100,000 operations at maximum switching power
TC2/CM2 TB2/NO2	Programmable Relay Outputs NO Contacts	• Minimum Switching Capacity: 16.7mA at 24V DC • Maximum Switching Capacity for Resistive Loads: NO-5A 240VAC, NO-7A 120VAC • Response Time: 5ms • Service Life: 100,000 operations at maximum switching power

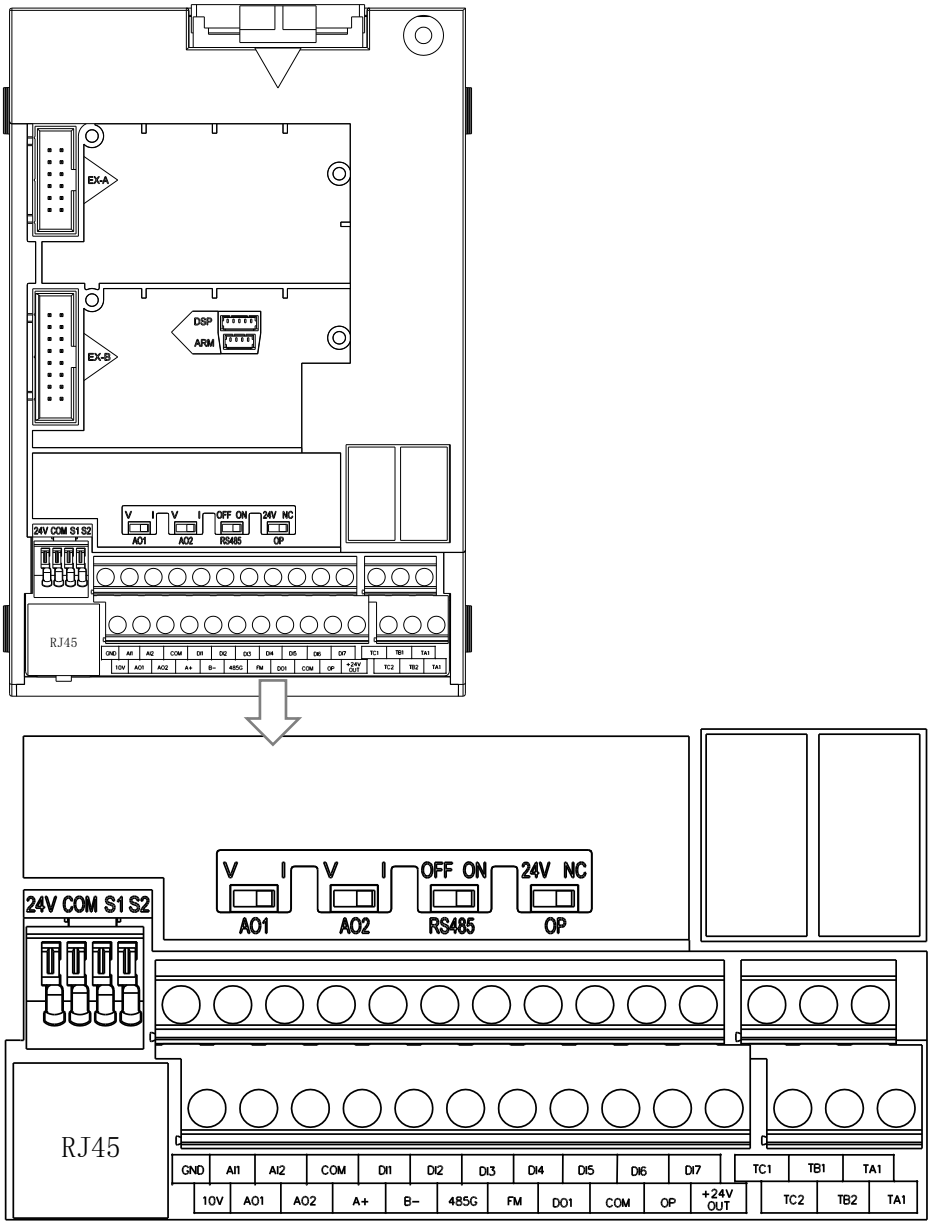
EX-A EX-B	Expansion Interfaces	Used for I/O, encoder, and communication modules
24V COM STO1 STO2	Safety Function Interfaces	• Factory Setting: 24V short-circuited with STO1 and STO2, respectively • If using an external 24V power supply, connect 0V to COM

5.6.5 Control Terminal Layout

Rack Sizes 1 ~ 5



Rack Sizes 6 ~ 13



Position and Instructions of the OP DIP Switch:

AO1 AO1_V AO1_I	AO1_V: AO1 Terminal Output (0 ~ 10V) AO1_I: AO1 Terminal Output (0 ~ 20mA or 4 ~ 20mA)
AO2 AO2_V AO2_I	AO2_V: AO2 Terminal Output (0 ~ 10V) AO2_I: AO2 Terminal Output (0 ~ 20mA or 4 ~ 20mA)
RS485 R_OFF R_ON	R_OFF: RS485 Not Connected to 120Ω Terminal Resistor R_ON: RS485 Connected to 120Ω Terminal Resistor
OP 24V NC	24V: Valid for Internal 24V NC: Valid for External 24V (external +24V DC should be connected to OP Terminal)

6. Commissioning

6.1 Power On and Set the AC Drive

Please follow the installation instructions in this manual to correctly connect the main circuit and control circuit cables before powering on and powering on the AC drive!

⚠ DANGER

Unexpected Equipment Startup

• When initially powering on the AC drive, it defaults to start and stop the equipment via the RUN button on the panel. To prevent unexpected startup, avoid touching the RUN button before completing the AC drive configuration.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

Inconsistent Line Voltage

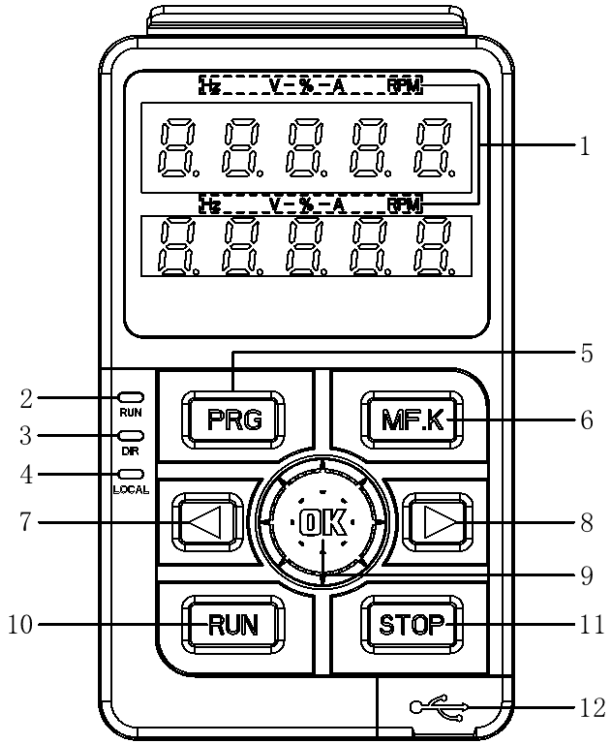
• Before powering on and configuring the AC drive, ensure that the line voltage is compatible with the power supply voltage range indicated on the AC drive's nameplate.

• Voltage inconsistency could damage the AC drive.

Failure to follow these instructions could result in property damage.

6.2 Introduction to Operation Panel

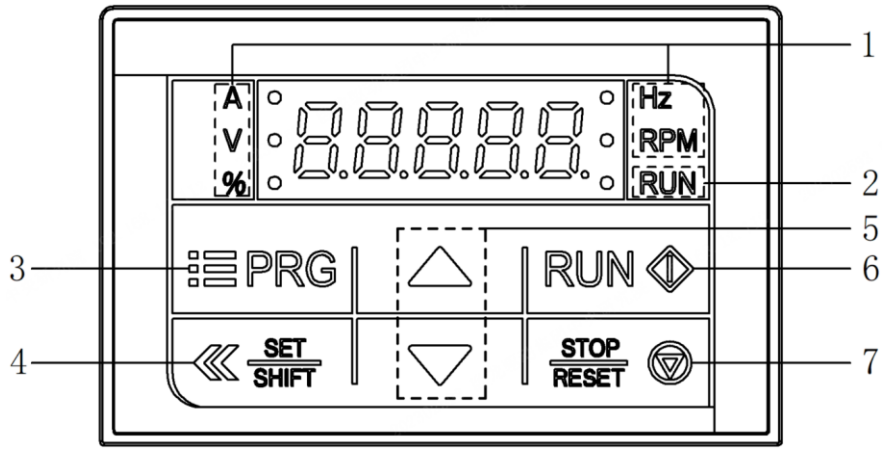
6.2.1 Dual-Display LED Keypad



1	Units	Hz: Frequency; A: Current; V: Voltage; RPM: Revolutions Per Minute; %: Percentage
2	Running Indicator	On: Running Off: Stop/Shutdown
3	Direction Indicator	On: Reverse Running Off: Forward Running
4	Local Control Indicator	On: Local (Keypad) Control Off: External Control (e.g., terminal control and communication control)
5	PRG	◆ During standby or running, press PRG to enter the function menu ◆ Press PRG to exit parameter modification mode
6	MF.K	Press MF.K (Code: P7-01) to set functions
7, 8	Left/Right	◆ In parameter modification mode, press Left or Right to switch between the units ◆ In display mode, press Left or Right to switch between the parameters
9	+/- 0K	◆ Rotate +/- clockwise to increase the value and counterclockwise to decrease the value. ◆ Press OK to confirm/save the value

10	RUN	Local control to run
11	STOP	Local control to stop/fault reset
12	USB Interface	Connected to the upper computer

6.2.2 Single-Display LED Keypad

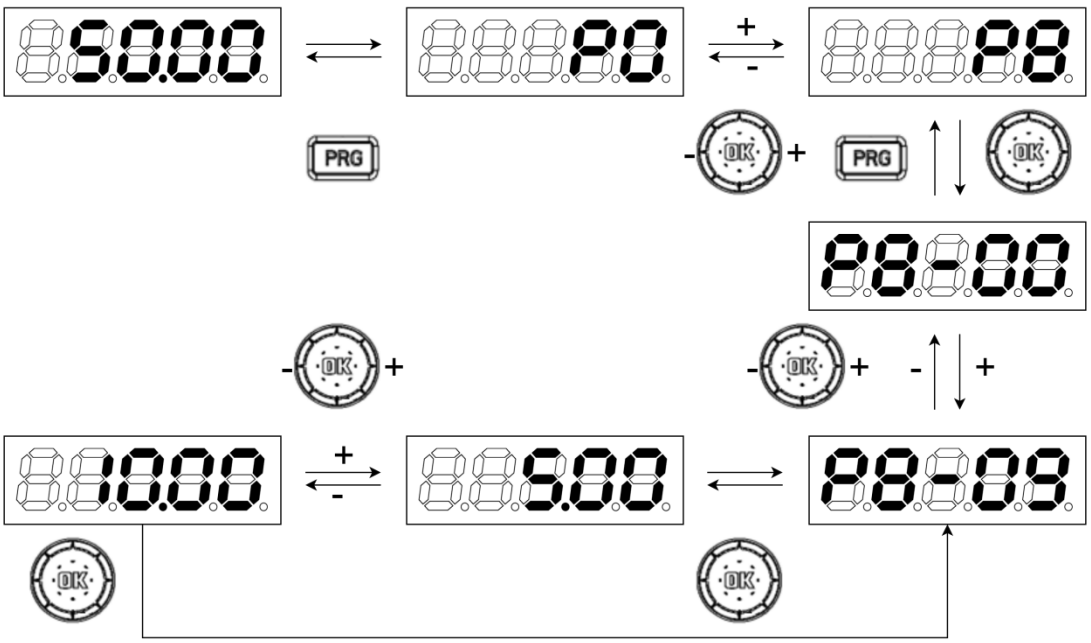


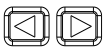
1	Units	Hz: Frequency; A: Current; V: Voltage; RPM: Revolutions Per Minute; %: Percentage
2	Running Indicator	On: Forward Running Flickering: Reverse Running
3	PRG	◆ During standby or running, press PRG to enter the function menu ◆ Press PRG to exit parameter modification mode
4	SET/SHIFT	◆ Press SET/SHIFT to confirm/save the value ◆ In parameter modification mode, press SET/SHIFT to switch between the units ◆ In display mode, press SET/SHIFT to switch between the parameters ◆ Press and hold SET/SHIFT for 1s to shift to the next parameter, and long press to shift circularly
5	Up/Down	Up: Increase the value Down: Decrease the value
6	RUN	Local control to run
7	STOP/RESET	Local control to stop/fault reset

6.2.3 Examples of Parameter Setting

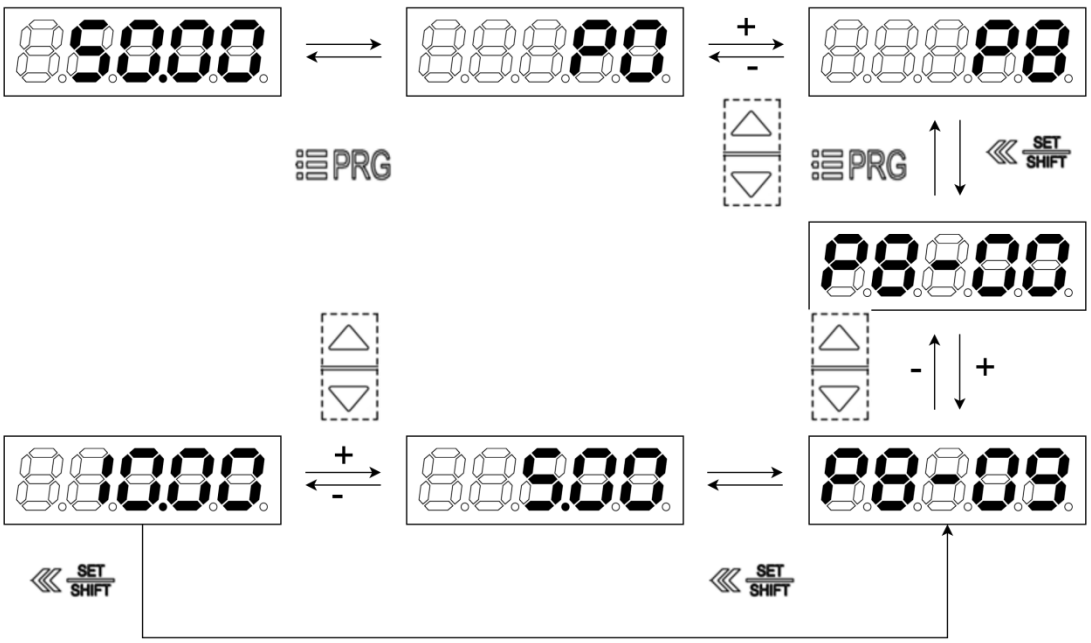
The following illustrates the basic panel operation method by setting P8-09 (Hopping Frequency 1) from 6.00Hz to 10.00Hz.

Dual-Display LED Keypad

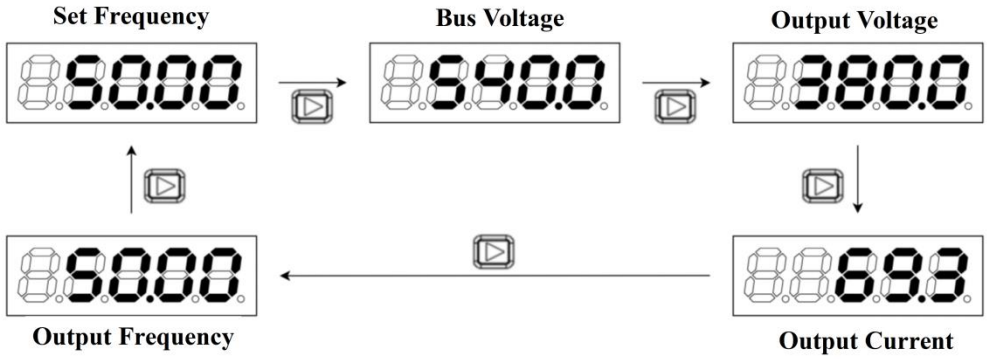


Use  to switch between the units (ones, tens, hundreds) of a parameter for quick modification.

Single-Display LED Keypad



View Monitoring Data



Dual-Display LED Keypad

Use  to cycle through the first line of monitoring parameters. Use  to cycle through the second line of monitoring parameters.

Single-Display LED Keypad

Use 

to switch between the parameters.

6.3 Factory Settings

WD400 Series's factory settings are designed for the most common operating conditions:

Function Code	Name	Default Value
P0-00	Load Characteristic	1: Heavy Load
P0-01	Motor Control Mode	2: V/F Control
P0-02	Command Source Selection	0: Operation Panel Command Channel
P0-03	Primary Frequency Source X Selection	0: Digital Setting (No Power-Off Memory for P0-08)
P0-08	Preset Frequency	50.00Hz
P0-10	Maximum Frequency	50.00Hz
P0-17	Acceleration Time 1	20s
P0-18	Deceleration Time 1	20s
P6-10	Stop Mode	0: Deceleration Stop
P1-00	Motor Type Selection	0: Standard Asynchronous Motor
P1-04	Motor Rated Frequency	50.00Hz
P4-00	DI1 Terminal Function Selection	1: Forward Running (FWD)
P4-01	DI2 Terminal Function Selection	8: Free Stop
P4-02	DI3 Terminal Function Selection	9: Fault Reset (RESET)
P4-11	Terminal Command Mode	0: Two-Wire Mode 1
P5-02	Relay Output 1	1: Inverter Running
P5-03	Relay Output 2	2: Fault Output (Fault Stop)
P5-07	AO1 Output Function Selection	0: Running Frequency
P6-10	Stop Mode	0: Deceleration Stop

Note: If the above values match your application, you can use the AC drive without changing the settings. If you wish to restore the preset values to the factory settings, set Parameter PP-01 to 1: Restore All Factory Parameters (excluding motor parameters).

6.4 Introduction to Common Function Parameters

The table below lists the common parameter groups of the frequency converter, enabling you to quickly familiarize yourself with the parameter structure:

Parameter Group	Name	Page	Function Description
P0	Basic Function Parameters	57	Load characteristics, Motor Control Mode, Command Source Selection, Frequency Reference Settings, Acceleration and Deceleration Time Settings, etc.
P1	Motor Parameters	61	Motor Type Selection, Motor Nameplate Parameter Settings, Motor Parameter Identification, Closed-loop Control Encoder Settings, etc.
P2	Vector Control Parameters	64	Speed Loop/Current Loop Parameter Settings, Excitation Regulation, Weak Magnetic Control for Synchronous Motors, etc.
P3	V/F Control Parameters	67	V/F Curve Settings, Torque Boost, Slip Compensation, etc.
P4	Input Terminal Parameters	70	Digital Input (DI) Terminal Function Settings, 2/3-Wire Terminal Control Settings, Analog Input Settings, Pulse Input Settings, etc.
P5	Output Terminal Parameters	77	Relay Output Function Settings, Analog Output Function Settings, Pulse Output, Thyristor Output Function Settings, etc.
P6	Start/Stop Control Parameters	81	Start/Stop Settings, Speed Tracking, Start/Stop DC Braking, etc.
P7	Display and Operation Parameters	83	Operation Display Settings, Stop Display Settings, PRG Panel Multi-Function Button Selection Settings, STOP/RESET Button Function Settings, etc.
P8	Auxiliary Function Parameters	86	Jog Control, Acceleration and Deceleration Time, Skip Frequency Settings, Frequency Detection, Current Detection, Timed Operation, Sleep/Wake Settings, etc.
P9	Fault Protection Parameters	91	Undervoltage, Overload, Load Loss Speed Protection, Short Circuit Protection, Input Phase Loss, Output Phase Loss, Fault record, etc.
PA	Process PID Control Parameters	99	Process PID Control Parameter Settings, etc.
PB	Swing Frequency, Length,	102	Swing Frequency Settings, Set Length,

	and Count		Actual Length, Pulses Per Meter, Set Count Value, Specified Count Value, etc.
PC	Multi-Speed, Simple PLC Parameters	103	Multi-Speed and Simple PLC Parameter Settings.
PD	Communication Parameters	108	Modbus RTU Communication Parameter Settings, etc.
PF	Factory Parameters	110	Frequency Converter Model, Frequency Converter Power, Temperature Curve, Voltage and Current Calibration Coefficients, etc.
PP	Function Code Management	111	User Password, Parameter Initialization, Parameter Display Control, etc.
A0	Torque Control Parameters	112	Torque Enable, Torque Control Source, Maximum Frequency for Torque Control in Forward/Reverse, etc.
A2	Second Motor Parameters	113	Motor Type Selection, Motor Nameplate Parameter Settings, Motor Parameter Identification, Closed-Loop Control Encoder Settings, etc.
A5	Control Optimization Parameters	116	PWM Modulation Control, Dead-Time Compensation, Undervoltage Point Settings, Overvoltage Point Settings, etc.
A6	AI Curve Settings	117	AI Curve 4 and Curve 5 Settings, AI Jump Point, Amplitude Settings, etc.
AC	AIAO Correction	119	AIAO Factory Calibration Parameters, etc.
U0	Monitoring Parameter Group	121	Running Frequency, Set Frequency, Output Frequency, Output Current, Output Torque, Output Power, etc.

6.5 Simple Startup

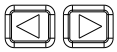
To start the AC drive for the first time, you can follow the basic setup procedures outlined below for a simple startup. If the factory settings meet your application, no further configuration is necessary.

Step 1: P0 Basic Function Parameters

a. Press 

to enter the parameter group, locate the P0 parameter group, and press  to enter;

b. Rotate  to select and modify the parameters listed below, and press  to save the settings;

Use  to switch between the units (ones, tens, hundreds) of the parameter for quick modification.

Function Code	Name	Default Value	Setting Range
P0-01	Motor Control Mode	0	0: Sensorless Vector Control (SVC) 1: Field-Oriented Vector Control (FVC) 2: V/F Control
P0-02	Command Source Selection	0	0: Operation Panel Command Channel 1: Terminal Command Channel 2: Communication Command Channel
P0-03	Primary Frequency Source X Selection	0	0: P0-08 Preset Frequency (Power-Off Memory unavailable) 1: P0-08 Preset Frequency (Power-Off Memory available) 2: AI1 3: AI2 4: AI3 5: PULSE Setting 6: Multi-Segment Command 7: Simple PLC 8: PID 9: Communication Setpoint
P0-08	Preset Frequency	50.00Hz	0.00～P0-10 Hz
P0-09	Running Direction	0	0: Run in Default Direction 1: Run in Opposite Direction
P0-10	Maximum Frequency	50.00Hz	50.00～500.00Hz
P0-12	Upper Limit Frequency	50.00Hz	P0-14～P0-10 Hz
P0-14	Lower Limit Frequency	0.00Hz	0.00～P0-12 Hz
P0-17	Acceleration Time 1	20s	0.0~6500.0s
P0-18	Deceleration Time 1	20s	0.0~6500.0s
P0-25	Acceleration /Deceleration Time Base Frequency	0	0: Maximum Frequency 1: Set Frequency 2: 100Hz

Step 2: P1 Motor Parameters

Function Code	Name	Default Value	Setting Range
P1-00	Motor Type Selection	0	0: Standard Asynchronous Motor 1: Variable Frequency Asynchronous Motor 2: Permanent Magnet Synchronous Motor
P1-01	Motor Rated Power	Determined by Inverter Rating	**Acquire the data from this motor nameplate:** 
P1-02	Motor Rated Voltage		
P1-03	Motor Rated Current		
P1-04	Motor Rated Frequency		
P1-05	Motor Rated Speed		
P1-37	Motor Parameter Identification	0	0: No Action 1: Asynchronous Motor Static Tuning 2: Asynchronous Motor Dynamic Tuning 3: Asynchronous Motor Complete Static Tuning 11: Synchronous Load Tuning 12: Synchronous No-Load Tuning

Motor Parameter Identification Notes:

1. Ensure all motor parameters must be set correctly before starting tuning.
2. If motor parameters change after tuning, motor parameter identification needs to be performed again.
3. Dynamic tuning is suitable for motors in a no-load state (recommended), while static tuning is suitable for motors that are loaded and where the motor shaft cannot be easily disconnected from the load.

Step 3: P4 Input Terminal Parameters

Function Code	Name	Default Value	Setting Range
P4-00	DI1 Terminal Function Selection	1: Forward Running (FWD)	Please refer to the complete parameter table.
P4-01	DI2 Terminal Function Selection	8: Free Stop	
P4-02	DI3 Terminal Function Selection	9: Fault Reset (RESET)	
P4-11	Terminal Command Mode	0: Two-Wire Type 1	

Step 4: P6 Start/Stop Control Parameters

Function Code	Name	Default Value	Setting Range
P6-00	Start Mode	0	0: Direct Start 1: Speed Tracking Restart 2: Pre-Excitation Start (for asynchronous motors) 3: SVC Quick Start
P6-10	Stop Mode	0	0: Deceleration Stop 1: Free Stop

Step 5: P9 Fault Protection Parameters

Function Code	Name	Default Value	Setting Range
P9-00	Motor Overload Protection Selection	1	0: Prohibited 1: Allowed
P9-01	Motor Overload Protection Gain	1.00	0.20 ~ 10.00

Step 6: Startup

After completing the above settings, you can start the AC drive.

Observe the output frequency and current during operation to ensure stability.

7. Function Application

7.1 Drive Configuration

7.1.1 Running Command Setting

7.1.1.1 Set Running Commands

Running Commands are used to control the start, stop, forward running, reverse running, and jogging of AC drives. There are three channels for Running Commands: operation panel, terminals, and communication. Parameter P0-02 is set to select the method of input for Running Commands.

Parameter	Function Definition	Default	Setting Range	Parameter Description
P0-02	Running Command Selection	0	0: Operation Panel Command Channel (LED OFF) 1: Terminal Command Channel (LED ON) 2: Communication Command Channel (LED Flashing)	Select the input channel for AC drive control commands. AC drive control commands include start, stop, forward running, reverse running, jogging, etc. 0: Operation Panel Command Channel Choose this command channel to enter control commands via the RUN, STOP/RES, MF.K buttons on the operation panel, suitable for initial commissioning. 1: Terminal Command Channel Choose this command channel to enter control commands via the DI terminals of the AC driver. Control commands for DI terminals can be set differently according to various occasions, such as starting/stopping, forward/reverse running, jogging, two/three-wire types, multi-speed functions, etc., suitable for most cases. 2: Communication Command Channel Choose this command channel to enter control commands via remote communication. The AC drive does not require an installed

				communication card; it can communicate directly with the upper computer through Terminal 485. Suitable for remote control or centralized control of multiple equipment systems, etc.

7.1.1.2 Set Running Commands Set Via the Operation Panel

Set Parameter P0-02 to 0. Use the RUN button and STOP/RES button on the operation panel to control the AC driver's running commands. Press the RUN button on the keypad to start the AC drive (RUN indicator light turns on). While the AC drive is running, press the STOP/RES button on the keypad to stop the AC drive (RUN indicator light turns off).

7.1.1.3 Set Running Commands Set Via the Terminals

Set Parameter P0-02 to 1. Use the terminals to control the start and stop of the AC driver. Parameter P4-11 sets the control mode of terminal commands, which includes Two-Wire Type 1, Two-Wire Type 2, Three-Wire Type 1, and Three-Wire Type 2.

Parameter	Function Definition	Default	Setting Range	Parameter Description
P4-11	Terminal Command Mode	0	0: Two-Wire Type 1 1: Two-Wire Type 2 2: Three-Wire Type 1 3: Three-Wire Type 2	4 different ways to control the AC driver's operation via the external terminals.

Any of the multi-functional input terminals (DI1 ~ DI10) can be selected as external input terminals. That is, by setting the values of P4-00 ~ P4-09 to select the functions of Input Terminals DI1 ~ DI10. Detailed function definitions can be found in "P4 - Input Terminals" under "Complete Parameter Tables".

Two-Wire Type 1

Example: Assign the forward running function to Terminal DI1 and the reverse running function to Terminal DI2.

Parameter	Function Definition	Set Value	Function Description
P4-11	Terminal Command Mode	0	Two-Wire Type 1
P4-00	DI1 Terminal Function Selection	1	Forward (FWD) Running
P4-01	DI2 Terminal Function Selection	2	Reverse (REV) Running

When the control switch SW1 is closed and SW2 is open, the motor runs forward; when SW1 is open and SW2 is closed, the motor runs in reverse; if both SW1 and SW2 are open or both are closed, the motor does not run. As shown in the following diagram:

SW1	SW1	Run Command
1	0	Forward
0	1	Reverse
0	0	Stop
1	1	Stop

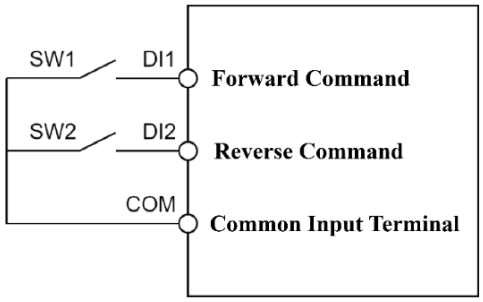


Figure 7-1. Wiring Diagram for Two-Wire Type 1

Two-Wire Type 2

Example: Assign the running command function to Terminal DI1 and the forward/reverse direction function to Terminal DI2.

Parameter	Function Definition	Set Value	Function Description
P4-11	Terminal Command Mode	1	Two-Wire Type 2
P4-00	DI1 Terminal Function Selection	1	Running Command
P4-01	DI2 Terminal Function Selection	2	Forward/Reverse Direction

When SW1 is closed, running is enabled. When SW2 is open, the motor runs forward; when SW2 is closed, the motor runs in reverse. If SW1 is open, regardless of whether SW2 is open or closed, the motor does not run. As shown in the following diagram:

SW1	SW2	Run Command
1	0	Forward
1	1	Reverse
0	0	Stop
0	1	Stop

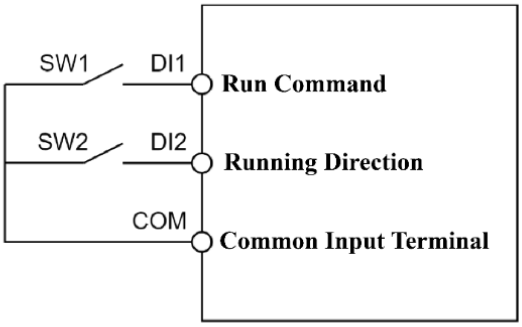


Figure 7-2. Wiring Diagram for Two-Wire Type 2

Three-Wire Type 1

Example: Assign the three-wire running control function to Terminal DI3, the forward running function to Terminal DI1, and the reverse running function to Terminal DI2. This control mode requires the AC drive to use the start/stop switch, connecting the start/stop button to Terminal DI3, the forward running button to Terminal DI1, and the reverse running button to Terminal DI2.

Parameter	Function Definition	Set Value	Function Description
P4-11	Terminal Command Mode	2	Three-Wire Type 1
P4-00	DI1 Terminal Function Selection	1	Forward (FWD) Running
P4-01	DI2 Terminal Function Selection	2	Reverse (REV) Running
P4-02	DI3 Terminal Function Selection	3	Three-Wire Running Control

When SW3 is closed, press SW1 to make the AC drive run forward, press SW2 to make the AC drive run in reverse, and the AC drive stops immediately upon disconnection of SW3. During normal startup and operation, it is necessary to keep SW3 closed. Commands for SW1 and SW2 take effect on the rising edge of the closure action. As shown in the following diagram:

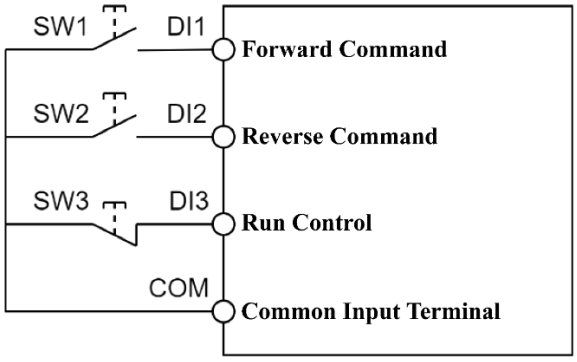


Figure 7-3. Wiring Diagram for Three-Wire Type 1

Three-Wire Type 2

Example: Assign the three-wire running control function to Terminal DI3, the running command function to Terminal DI1, and the forward/reverse direction function to Terminal DI2. Connect the start/stop button to Terminal DI3, the running enabling to Terminal DI1, and the forward/reverse running button to Terminal DI2.

Parameter	Function Definition	Set Value	Function Description
P4-11	Terminal Command Mode	3	Three-Wire Type 2
P4-00	DI1 Terminal Function Selection	1	Running Command

P4-01	DI2 Terminal Function Selection	2	Forward/Reverse Direction
P4-02	DI3 Terminal Function Selection	3	Three-Wire Running Control

When SW3 is closed, press SW1 to make the AC drive run. If SW2 is open, the AC drive runs forward; if SW2 is closed, the AC drive runs in reverse. The AC drive stops immediately upon disconnection of SW3. During normal startup and operation, it is necessary to keep SW3 closed. Commands for SW1 take effect on the rising edge of the closure action. As shown in the following diagram:

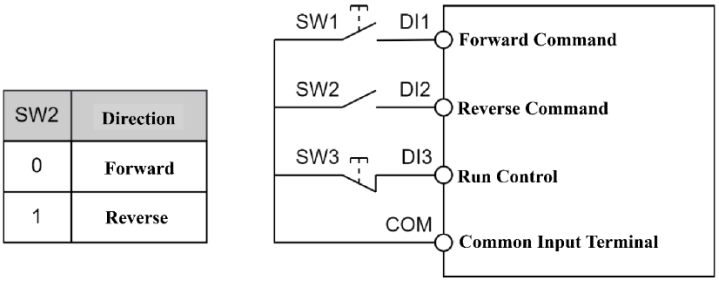


Figure 7-4. Wiring Diagram for Three-Wire Type 2

7.1.1.4 Set Running Commands Set Via the Communication

Set Parameter P0-02 to 2. Choose to use the communication method to set Running Commands for the AC driver, enabling control of the AC driver's start, stop, and other commands. Below is an example using the Modbus protocol to explain the process of setting Running Commands via the communication.

Parameter	Function Definition
PD-00	Communication Baud Rate
PD-01	MODBUS Data Format
PD-02	Local Address
PD-03	MODBUS Response Delay
PD-04	Serial Communication Timeout

The communication settings must match those of the upper computer.

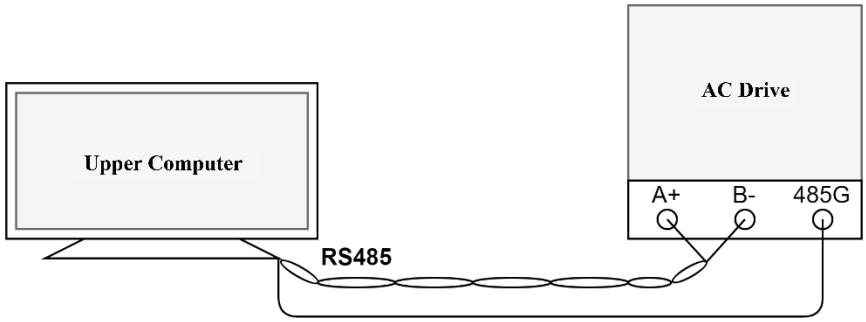


Figure 7-5. Wiring Diagram for RS485

For example, to make the AC drive run forward using the communication mode, send the write command as 01 06 20 00 00 01 43 CA (in hexadecimal format). Other communication addresses and control commands can be referenced in the “Appendix: Modbus Communication”.

Command	Meaning
01H (Adjustable)	AC Drive Address
06H	Write Command
2000H	Control Command Communication Address
01H (Forward Running)	Control Command
43CAH	CRC Checksum

The master-slave communication command format is as follows:

Master Command Information		Slave Response Information	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
Parameter Address High	20H	Parameter Address High	20H
Parameter Address Low	00H	Parameter Address Low	00H
Data Content High	00H	Data Content High	00H
Data Content Low	01H	Data Content Low	01H
CRC High	43H	CRC High	43H
CRC Low	CAH	CRC Low	CAH

7.1.2 Frequency Command Setting

7.1.2.1 Frequency Command Input Methods

There are three methods for frequency command input: primary frequency selection, auxiliary frequency selection, and overlayed primary-auxiliary frequency selection.

7.1.2.2 Primary Frequency Selection

There are ten methods in total for inputting the primary frequency command: digital setting (power-off memory unavailable), digital setting (power-off memory available), AI1, AI2, AI3, PULSE input, multi-segment command, simple PLC, PID, and communication. The primary frequency source X can be selected by setting the value of Parameter P0-03 (0 ~ 9).

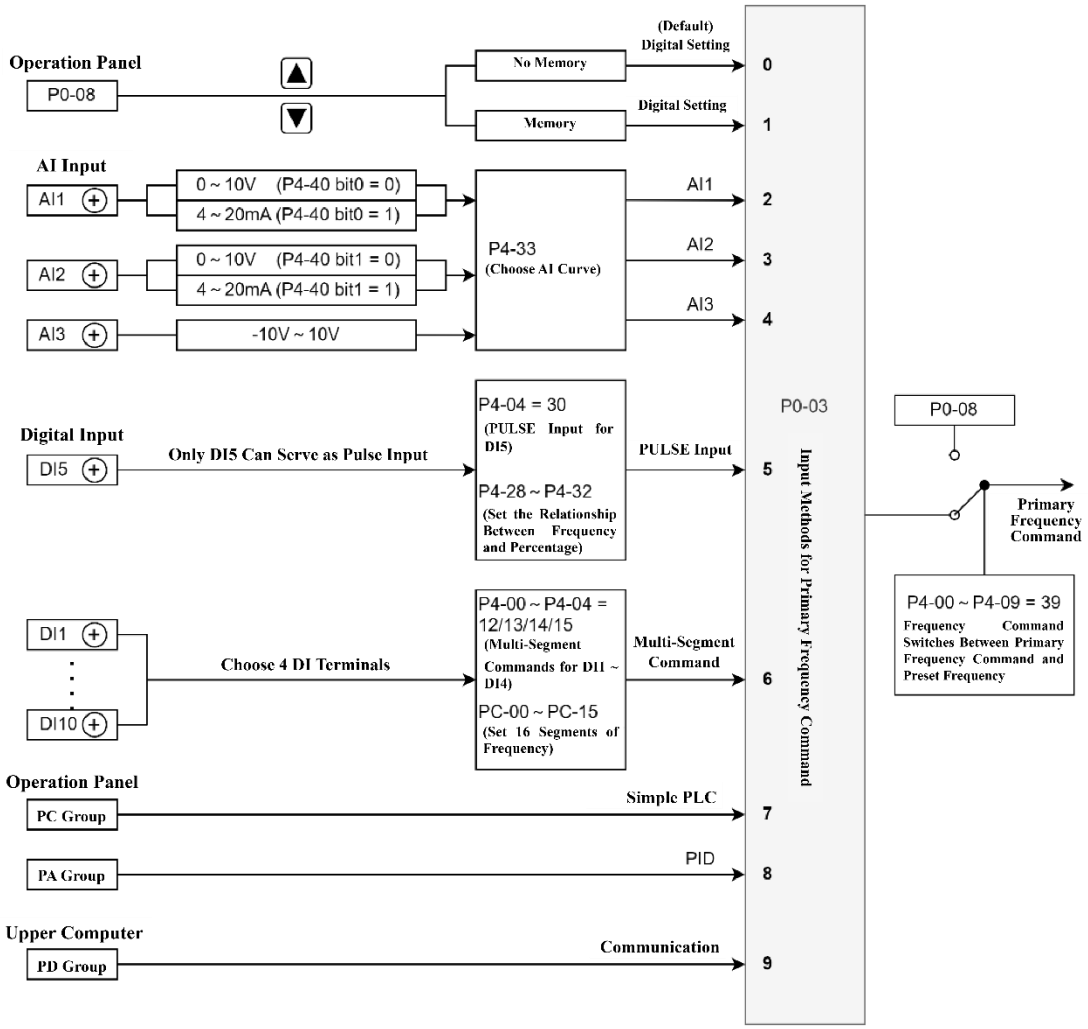


Figure 7-6. Diagram for Primary Frequency Command Selection

Parameter	Function Definition	Range	Default
P0-03	Primary Frequency Source X Selection	0: Digital Setting (P0-08 Preset Frequency, UP/DOWN turning allowed, Power-Off Memory unavailable) 1: Digital Setting (P0-08 Preset Frequency, Power-Off Memory available) 2: AI1 3: AI2 4: AI3	0

		5: PULSE Setting (DI5) 6: Multi-Segment Command 7: Simple PLC 8: PID 9: Communication	

7.1.2.3 Set the Primary Frequency Via the Operation Panel

Two scenarios are involved in setting the primary frequency via the operation panel:
P0-03 = 0 (Power-Off Memory unavailable): If the set frequency is modified using UP/DOWN, when the AC drive is powered down and then restarted, the set frequency value returns to the preset frequency (P0-08) setting.
P0-03 = 1 (Power-Off Memory available): If the set frequency is modified using UP/DOWN, when the AC drive is powered down and then restarted, the set frequency value remains at the last set frequency before the shutdown.

Note:
When the frequency is modified using the UP/DOWN button, if P0-23 = 0 (no memory), the modified value will reset as the AC drive stops; if P0-23 = 1 (memory), the modified value will not reset.
Example: When P0-08 has a preset frequency of 30Hz, and the frequency is adjusted to 40Hz using the UP button, if P0-23 = 0 (no memory), the set frequency returns to 30Hz (P0-08 preset frequency) after the AC drive stops; if P0-23 = 1 (memory), the frequency remains at 40Hz after the AC drive stops.

Parameter	Function Definition	Range	Default
P0-08	Preset Frequency	0.00 ~ P0-10Hz	50.00Hz
P0-10	Maximum Frequency	50.00 ~ 500.00Hz	50.00Hz
P0-23	Digital Setting (Shutdown Memory Selection)	0: No Memory 1: Memory	0

7.1.2.4 Set the Primary Frequency Via Analog Input (AI)

Setting the primary frequency via the analog input involves choosing one of three AI terminals (AI1, AI2, or AI3). Set P0-03 to 2 for AI1 terminal input, 3 for AI2 terminal input, and 4 for AI3 terminal input.
AI terminals are the references of frequency sources, and each AI terminal can have five different AI curves. The procedure of how to set AI curves is introduced first and then how to choose an appropriate AI curve, as shown below:

Step	Parameter	Description
Step 1: Establish the relationship between AC	P4-13 ~ P4-16	AI Curve 1 Setting
	P4-18 ~ P4-21	AI Curve 2 Setting

Drive's voltage/current input and set value	P4-23 ~ P4-26	AI Curve 3 Setting
	A6-00 ~ A6-07	AI Curve 4 Setting
	A6-08 ~ A6-15	AI Curve 5 Setting
	P4-33	AI Curve Selection (AI terminals can be assigned to any of the AI curves. Typically, the default setting P4-33 = 321H is used, assigning AI1 to Curve 1, AI2 to Curve 2, and AI3 to Curve 3.)
	P4-34	AI Below Minimum Input Setting Selection (when the AI is used as a frequency command, the voltage/current input corresponds to the set 100.0%, which is relative to the maximum frequency P0-10.)
Step 2: Set the filter time for AI inputs	P4-17, P4-22, P4-27	Filter Times for AI1 ~ AI3
Step 3: Set the AI terminal as the primary frequency source, and select the AI input terminal according to the terminal characteristics	P0-03	P0-03 = 2 Select AI1 to choose between voltage or current input via P4-40 bit0.
		Select AI2 to choose between voltage or current input via P4-40 bit1.
		P0-03=4 Select AI3

AI Curve Setting

There are five types of AI curves, where Curves 1, 2, and 3 are all two-point curves, associated parameters are P4-13 ~ P4-27. Curves 4 and 5 are four-point curves, associated parameters are in Group A6. AI curve setting is about defining the relationship between the analog voltage (or analog current) input and its designated value.

Taking the setting of AI curve 1 as an example, the relevant parameters are P4-13, P4-14, P4-15, and P4-16.

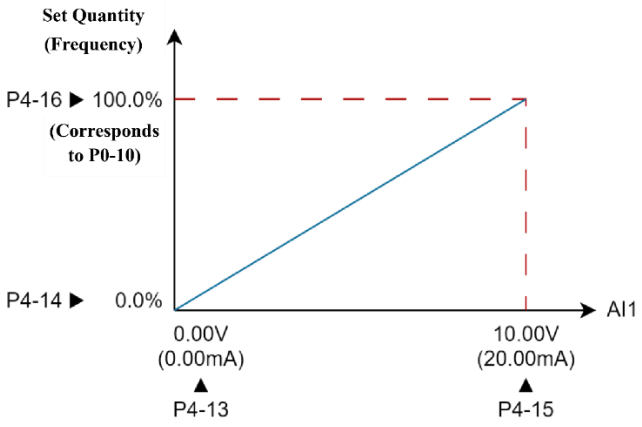


Figure 7-7. AI Curve 1 Setting

When AI is used for frequency reference, the 100% voltage or current input is relative to the maximum frequency P0-10. When the analog input is a current input, 1mA current is equivalent to 0.5V voltage, 0mA ~ 20mA is equivalent to 0V ~ 10V, and 4mA ~ 20mA is equivalent to 2V ~ 10V.

The setting method for Curves 2 and 3 is the same as for Curve 1. The parameters for Curve 2 are P4-18 ~ P4-21; for Curve 3, they are P4-23 ~ P4-26.

Curves 4 and 5 have similar functionality to Curves 1 ~ 3, but Curves 1 ~ 3 are linear, while Curves 4 and 5 are four-point curves, allowing for more flexible relationships.

When setting Curves 4 and 5, the minimum input voltage, Inflection Point 1 voltage, Inflection Point 2 voltage, and maximum voltage must increase in sequence. The parameters for curve 4 are A6-00 ~ A6-07; for curve 5, they are A6-08 ~ A6-15.

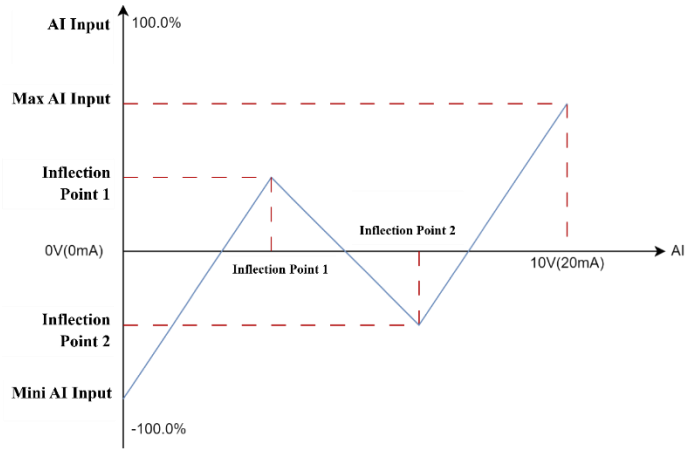


Figure 7-8. Curve 4 and Curve 5

Select AI Curves for AI Terminals

The AI curves corresponding to AI Terminals AI1, AI2, and AI3 are selected according to the ones, tens, and hundreds place of Parameter P4-33, respectively. Each of the three AI terminals can fit with any of the five curves.

The longer the AI input filter time, the stronger the anti-interference ability, but the slower the adjustment response; the shorter the filter time, the faster the adjustment response, but the weaker the anti-interference ability. When the on-site analog input is easily disturbed, increase the filter time to stabilize the detected analog signal, but the longer the filter time, the slower the detection response speed of the analog quantity, so how to set it depends on the actual application situation.

Set AI Terminals as the Primary Frequency Sources

The control board provides two analog input terminals AI1 and AI2. An optional I/O expansion card can provide another analog input terminal AI3. AI1 and AI2 terminals can be 0V ~ 10V voltage type inputs or 0mA ~ 20mA current inputs, which can be switched via setting bit 0 or bit 1 of P4-40. AI3 terminal is a bipolar voltage signal input of -10V ~ 10V. Below we describe the setting method for each AI terminal as the primary frequency source separately.

Example: If Terminal AI1 selects curve 1 (the ones place of P4-33 set to 1), the voltage-type input terminal AI1, when serving as the frequency source, needs to reach 10Hz ~ 40Hz (corresponding to 2V ~ 10V). The diagram for parameter setting is as follows:

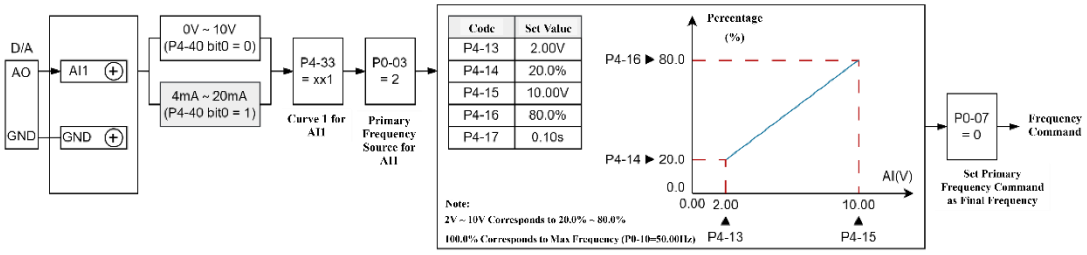


Figure 7-9. Parameter Setting of Voltage-Type Input Terminal AI1 as the Primary Frequency

Example: If Terminal AI2 selects curve 2 (the tens place of P4-33 set to 2), the current-type input terminal AI2, when serving as the frequency source, needs to reach 0Hz ~ 50Hz (corresponding to 4mA ~ 20mA). The diagram for parameter setting is as follows:

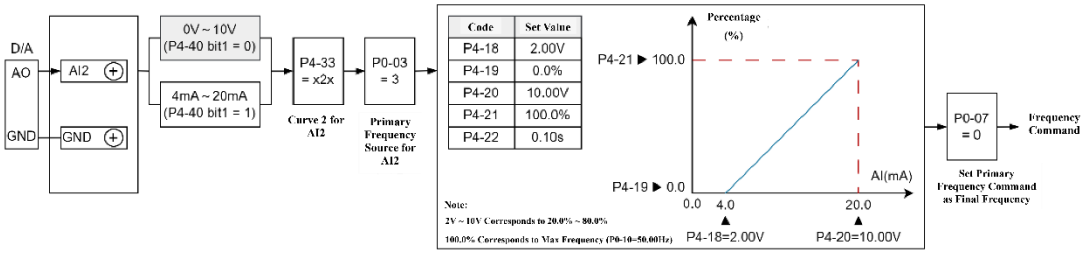


Figure 7-10. Parameter Setting of Current-Type Input Terminal AI2 as the Primary Frequency

Example: If Terminal AI3 selects curve 3 (the hundreds place of P4-33 set to 3), the voltage type input terminal AI3, when serving as the frequency source, needs to reach 10Hz ~ 50Hz (corresponding to 2V ~ 10V). The diagram for parameter setting is as follows:

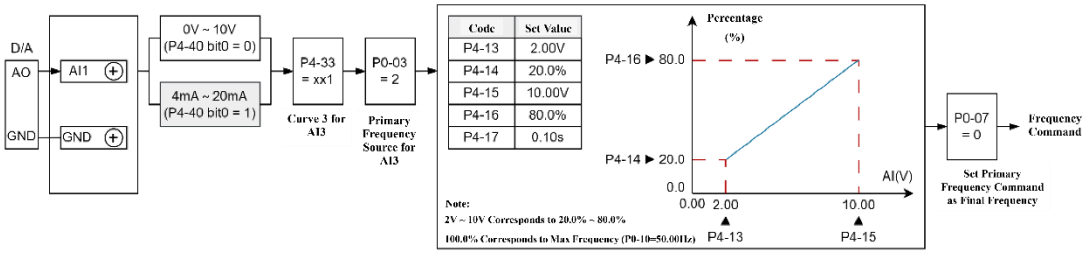


Figure 7-11. Parameter Setting of Voltage-Type Input Terminal AI3 as the Primary Frequency

7.1.2.5 Set the Primary Frequency Via a Multi-Segment Command

Using a multi-segment command as the primary frequency references fits for applications where continuous adjustment of the AC driver's running frequency is not required and only a few specific frequency values are needed.

Up to 16 segments of running frequency can be defined, selectable via the combination of the input signals of 4 DI terminals. Fewer than 4 DI terminals is also available for multi-segment frequency reference, with missing settings considered as "0" state. Multi-Segment Commands 0 ~ 15 correspond to Parameters PC-00 ~ PC-15, with the reference of Multi-Segment Command 0 being PC-51.

In addition to serving as the primary frequency reference, multi-speed commands can also act as the voltage sources for V/F separation or as the set sources for a process PID.

Multiple Segments	DI Terminals
2 Segments	One DI Terminal: K1
3 ~ 4 Segments	Two DI Terminals: K1 and K2
5 ~ 8 Segments	Three DI Terminals: K1, K2, and K3
9 ~ 16 Segments	Four DI Terminals: K1, K2, K3, and K4

Application Example

Step 1: Set Parameter P0-03 to 6. Select a multi-speed command as the primary frequency reference;

Step 2: Set the function selection of DI terminals. Assuming DI1, DI2, DI3, and DI4 are chosen as the signal input terminals for multi-segment frequency, set P4-00, P4-01, P4-02, and P4-03 to function values 12 ~ 15. Thus, Multi-Segment Command Input Terminals 1 ~ 4 are designated.

In the figure below, DI1, DI2, DI3, and DI4 serve as the signal input terminals for multi-segment frequency, forming a 4-bit binary number. Depending on their status combination, a multi-segment frequency is determined. When (DI4, DI3, DI2, DI1) = (0, 0, 1, 0), the formed status combination is 2, and Parameter PC-02 is selected. Thus, the target running frequency is automatically calculated by (PC-02) × (P0-10).

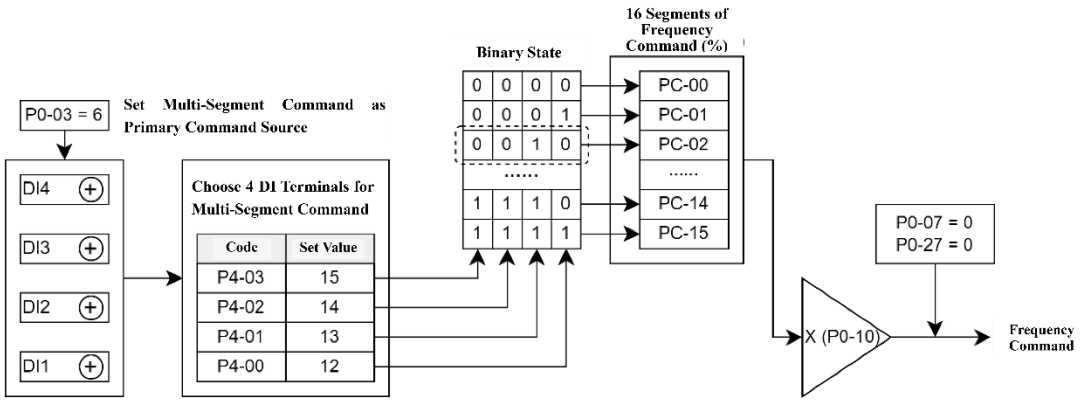


Figure 7-12. Diagram for Multi-Segment Speed Mode Setting

4 multi-segment command terminals can combine into 16 statuses corresponding to 16 command set values, as shown in the table below:

K4	K3	K2	K1	Command	Parameter
OFF	OFF	OFF	OFF	Multi-Segment Command 0	PC-00 (PC-51=0)

OFF	OFF	OFF	ON	Multi-Segment Command 1	PC-01
OFF	OFF	ON	OFF	Multi-Segment Command 2	PC-02
OFF	OFF	ON	ON	Multi-Segment Command 3	PC-03
OFF	ON	OFF	OFF	Multi-Segment Command 4	PC-04
OFF	ON	OFF	ON	Multi-Segment Command 5	PC-05
OFF	ON	ON	OFF	Multi-Segment Command 6	PC-06
OFF	ON	ON	ON	Multi-Segment Command 7	PC-07
ON	OFF	OFF	OFF	Multi-Segment Command 8	PC-08
ON	OFF	OFF	ON	Multi-Segment Command 9	PC-09
ON	OFF	ON	OFF	Multi-Segment Command 10	PC-10
ON	OFF	ON	ON	Multi-Segment Command 11	PC-11
ON	ON	OFF	OFF	Multi-Segment Command 12	PC-12
ON	ON	OFF	ON	Multi-Segment Command 13	PC-13
ON	ON	ON	OFF	Multi-Segment Command 14	PC-14
ON	ON	ON	ON	Multi-Segment Command 15	PC-15

7.1.2.6 Set the Primary Frequency Via the Simple PLC

Step 1: Set Parameter P0-03 to 7 to select the simple PLC as the primary frequency reference;

Step 2: Set Parameters PC-00 to PC-15, and PC-18 ~ PC-49 to define their running durations and acceleration/deceleration times;

Step 3: Set Parameter PC-16 to choose the running mode of the simple PLC;

Step 4: Set Parameter PC-17 to choose whether to remember the previous running phase and frequency after the PLC powers off or stops.

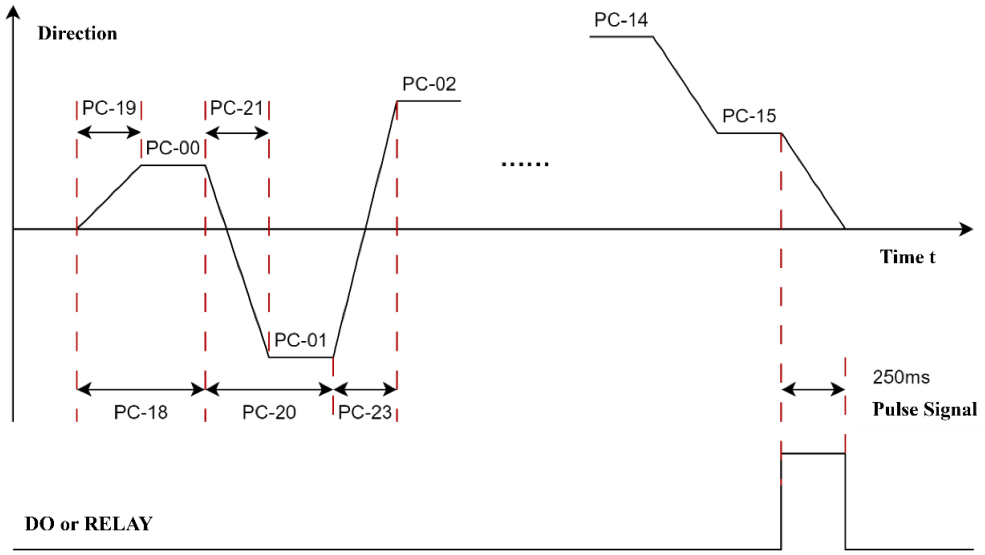


Figure 7-13. Diagram for Setting the Simple PLC as the Primary Frequency Reference

7.1.2.7 Set the Primary Frequency Via PID

PID control is a common method for process control, which involves performing proportional, integral, and derivative operations on the difference between the feedback signal of the controlled variable and the target signal, adjusting the output frequency of the AC drive to form a closed-loop system, and stabilizing the controlled variable at the desired value. Choosing the output of PID control as the running frequency is typically used for field process closed-loop controls, such as constant pressure closed-loop control and constant tension closed-loop control.

Proportional Gain (Kp): Once there is a deviation between the output of PID control and the setpoint, PID will adjust its control output to drive the controlled variable towards reducing the deviation. The speed at which the deviation reduces depends on the proportional coefficient Kp. The larger the Kp, the faster the deviation decreases, but it can be prone to oscillations, especially in cases with a significant delay. The smaller the Kp, the likelihood of oscillations and the regulation rate drop. A proportional gain of 100.0 means that when the deviation between the PID feedback quantity and the given quantity is 100.0%, the adjustment magnitude of the PID controller's output frequency command reaches the maximum frequency.

Integral Time (Ti): Determines the intensity of the integral regulation of the PID controller. The shorter the integral time, the stronger the regulation intensity. It refers to that when the deviation between the PID feedback quantity and the given quantity is 100.0%, the integral controller performs continuous regulation at the maximum frequency within the integral time.

Derivative Time (Td): Determines the regulation intensity of the PID controller on the deviation variation rate. The longer the derivative time, the stronger the regulation intensity. It refers to that the feedback quantity changes by 100.0% within the deviation time and the derivative controller operates at the maximum frequency.

Application Example

Step 1: Set Parameter P0-03 to 8, and Parameter P0-04 to 8. Choose PID as the primary frequency command input and auxiliary frequency command input;

Step 2: Set Parameter PA-00 to choose the given quantity channel for the PID controller. When PA-00 is set to 0, further set PA-01 (PID Value Reference), where 100% corresponds to the maximum value of the PID feedback quantity;
Step 3: Set Parameter PA-02 to choose the PID feedback source;
Step 4: Set Parameter PA-03 to choose the direction of PID action.

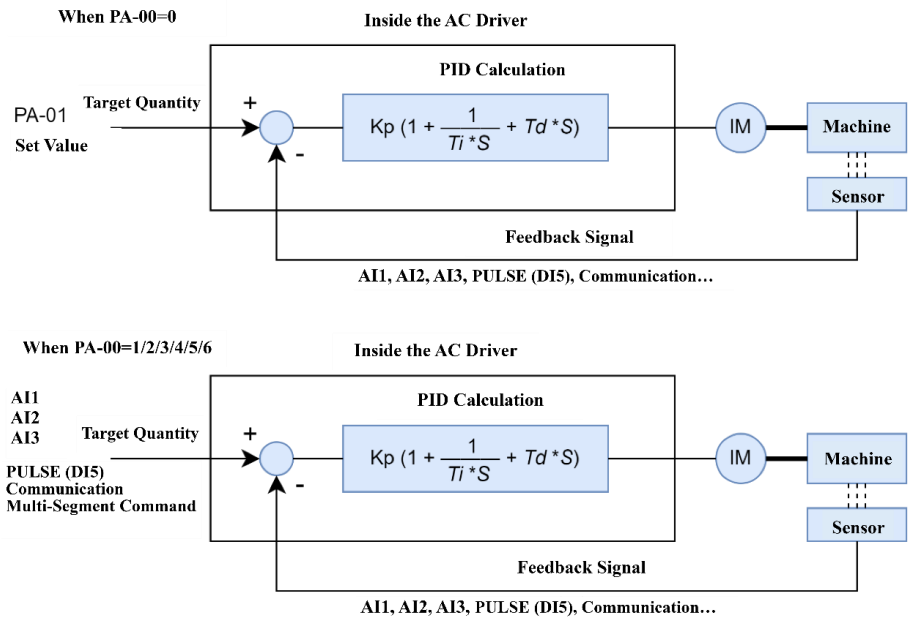


Figure 7-14. Diagram for Process PID Control

Setting Logic of the Process PID Control Parameter:

For the upper and lower limits and range of the frequency output when PID is the primary frequency reference (e.g., pure PID or primary + PID):

When the reverse cutoff frequency is 0 or reversal is prohibited (i.e., any of the following 3 cases): (1) PA-08 = 0, P8-13 = 0; (2) PA-08 = 0, P8-13 = 1; (3) PA-08 ≠ 0, P8-13 = 1

Output Upper Limit = Upper Limit Frequency

Output Lower Limit = Lower Limit Frequency

Output Range = Lower Limit Frequency ~ Upper Limit Frequency (i.e., P0-14 ~ P0-12)

When the reversal cutoff frequency is not 0 and reversal is not prohibited (i.e., PA-08 ≠ 0, P8-13 = 0)

Output Upper Limit = Upper Limit Frequency

Output Lower Limit = -Reverse Cutoff Frequency

Output Range = -Reverse Cutoff Frequency ~ Upper Limit Frequency (i.e., -PA-08 ~ P0-12)

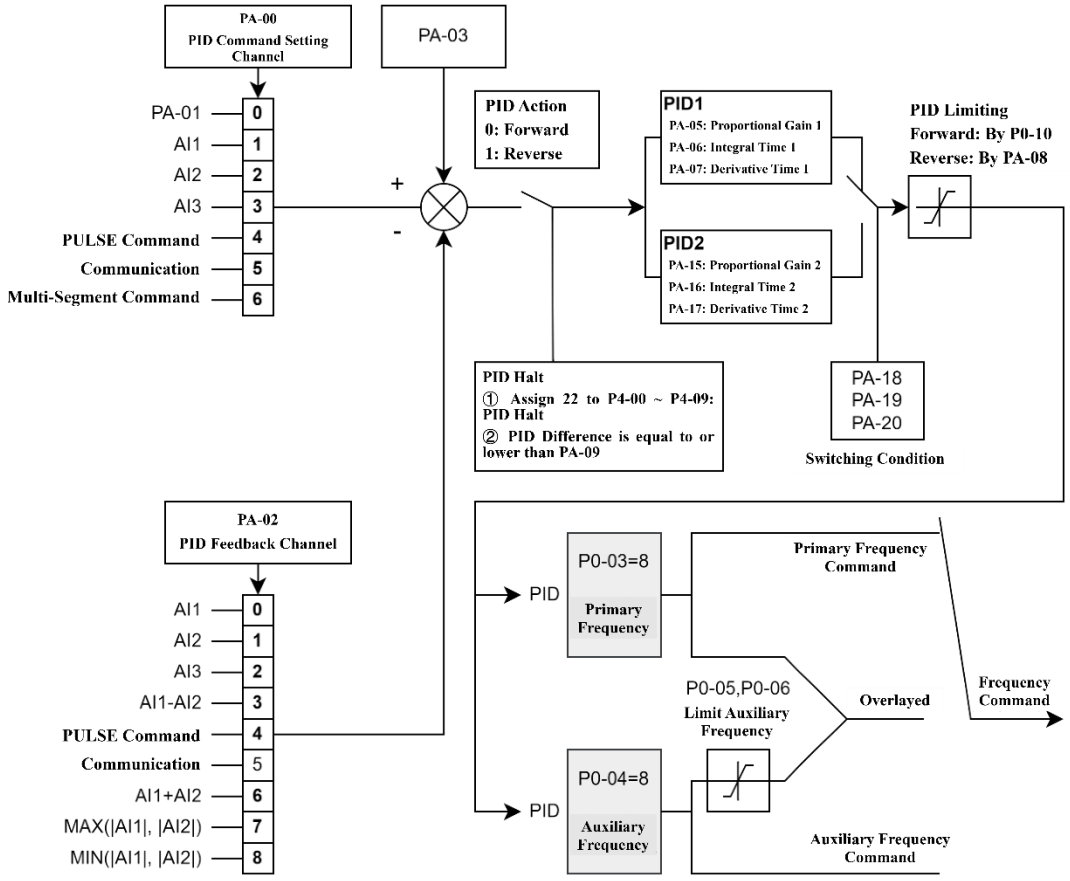


Figure 7-15. Diagram for Process PID Control Parameter Setting

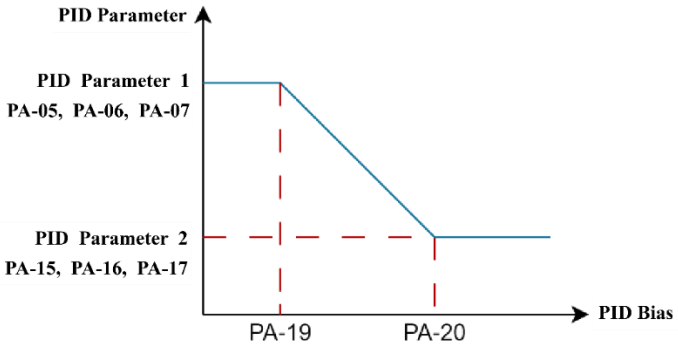


Figure 7-16. PID Parameter Switching

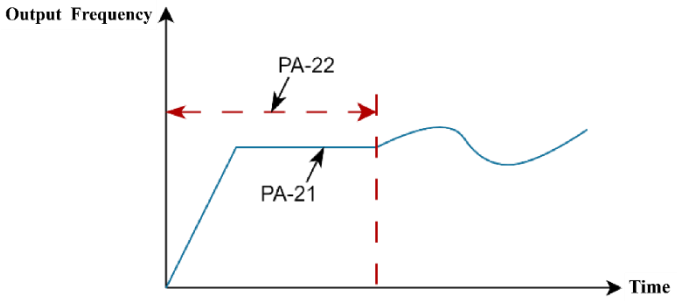


Figure 7-17. Diagram for PID Initial Value Function

7.1.2.8 Set the Primary Frequency Via Communication

Communication protocols supported: Modbus, Profibus-DP, CANopen, Profinet, EtherCAT, etc. For Modbus communication, PD-00 (baud rate), PD-01 (data format), and PD-02 (local address) need to be configured.

Application Example

Step 1: Set parameter P0-03 to 9 to choose communication as the primary frequency command source;
Step 2: Send a write command from the upper computer to the AC driver.

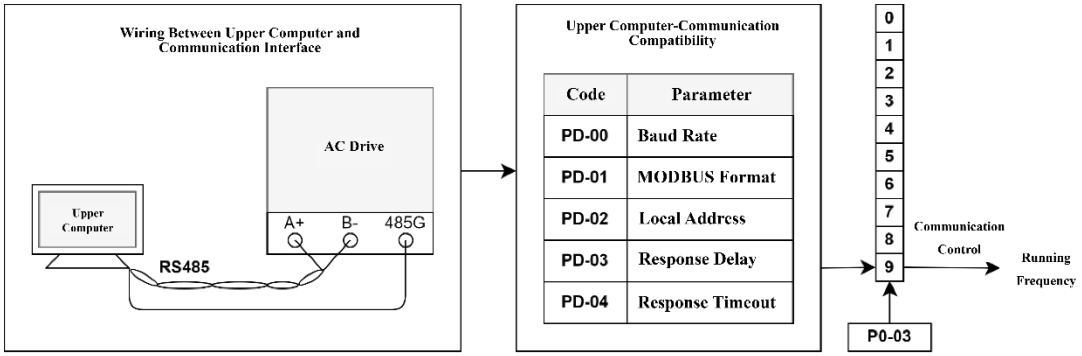


Figure 7-18. Setting of Relevant Parameters in the Case of Communication Reference

The range given by communication is -10000 ~ 10000, corresponding to the frequency range of -100.00% ~ 100.00%. Assuming P0-10 (maximum frequency) is set to 50.00Hz, if the value written in the command is 10000, the actual written frequency value is 50.00 × 100% = 50.00Hz. Below is an example using the Modbus protocol to illustrate the process of setting the primary frequency through communication.
Example: To set the frequency to 50.00Hz via communication, write "10000" to 1000H and send the write command as 01 06 10 00 27 10 97 36. The meaning of each byte is as follows:

Byte	Meaning
01H (Adjustable)	AC Drive Address
06H	Write Command
1000H	Set Frequency Address
2710H (Decimal 10000)	Target Frequency Value
9736H	CRC Checksum

Similarly, to set the frequency to -50.00Hz via communication, write "-10000" to address 1000H and send the write command as 01 06 10 00 D8 F0 D7 4E, where "D8F0" is the lower four bits of "-10000" after hexadecimal conversion.

7.1.2.9 Auxiliary Frequency Selection

There are ten methods in total for inputting the auxiliary frequency command: digital setting (power-off memory unavailable), digital setting (power-off memory available), AI1, AI2, AI3, PULSE input, multi-segment command, simple PLC, PID, and communication. The auxiliary frequency source Y can be selected by setting the value of Parameter P0-04 (0 ~ 9).

The auxiliary frequency instruction, when used as an independent frequency setting channel, has the same usage as the primary frequency instruction. The logic block diagram is shown in the figure below. Additionally, the auxiliary frequency instruction can be used for additive setting, combining the primary and auxiliary frequency instructions to achieve frequency setting. For specifics, see "Choosing the Input Method for Combined Primary and Auxiliary Frequency Instructions."

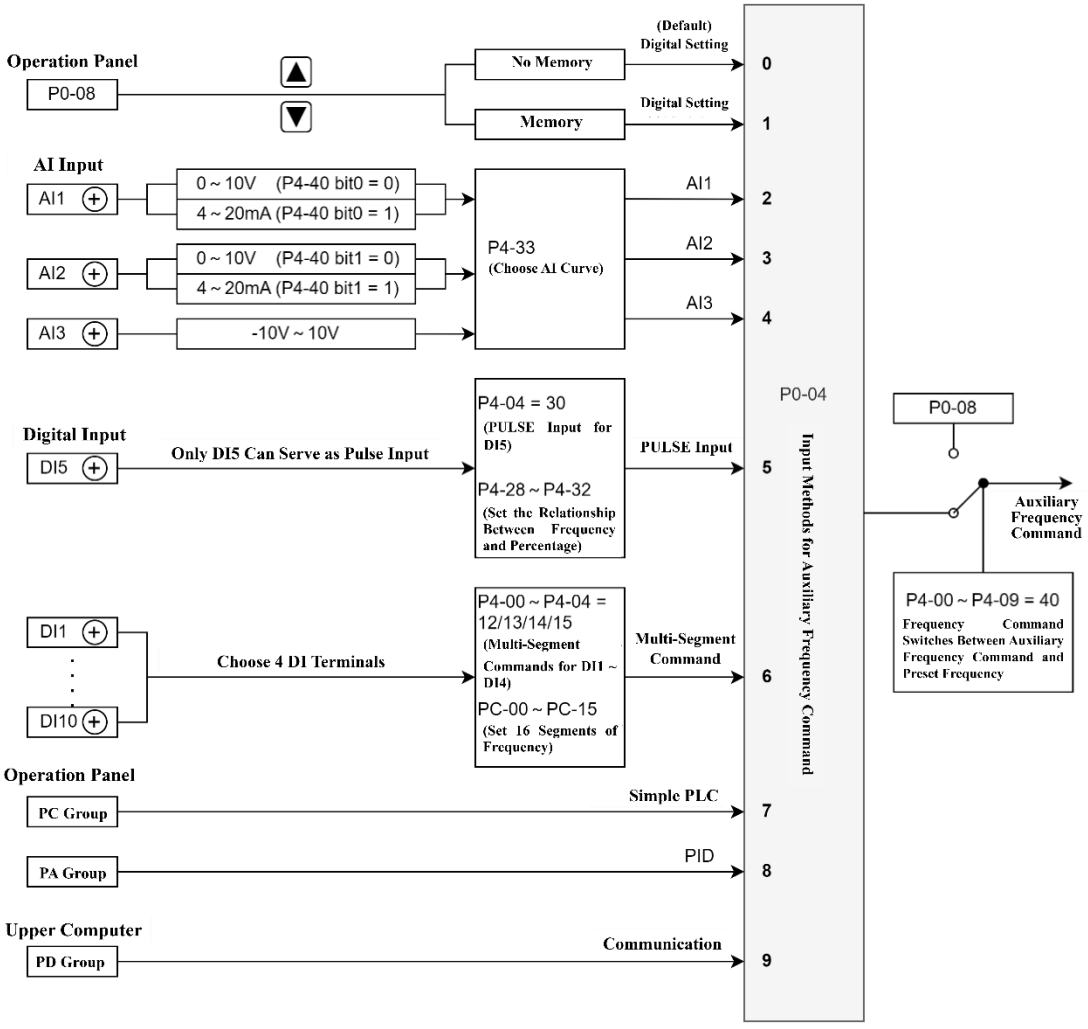


Figure 7-19. Diagram for Auxiliary Frequency Selection

Parameter	Name	Setting Range	Default
P0-04	Auxiliary Frequency Source Y Selection	0: Digital Setting (P0-08 Preset Frequency, UP/DOWN turning allowed, Power-Off Memory unavailable) 1: Digital Setting (P0-08 Preset Frequency, UP/DOWN turning allowed, Power-Off Memory available) 2: AI1 3: AI2 4: AI3 5: PULSE Setting (DI5) 6: Multi-Segment Command 7: Simple PLC 8: PID 9: Communication	0

7.1.2.10 Overlayed Primary-Auxiliary Frequency Selection

Overlayed primary-auxiliary frequency selection involves achieving frequency setting through the combination of primary and auxiliary frequency commands. By setting Parameter P0-07, the relationship between the target frequency and the primary-auxiliary frequency command can be defined. There are four relationships:

No.	Relationship Between the Target Frequency and the Primary-Auxiliary Frequency Command	
1	Primary Frequency Command	Primary frequency command directly serves as the target frequency reference
2	Auxiliary Frequency Command	Auxiliary frequency command directly serves as the target frequency reference
3	Primary-Auxiliary Operation	Primary-Auxiliary operation includes 4 scenarios: Primary Frequency + Auxiliary Frequency, Primary Frequency - Auxiliary Frequency, Larger Value Between Primary Frequency and Auxiliary Frequency, Smaller Value Between Primary Frequency and Auxiliary Frequency
4	Frequency Switch	When the function selection of DI terminals is set to 18 (Frequency Command Switching), it is allowed to select or switch any of the three commands via DI terminals.

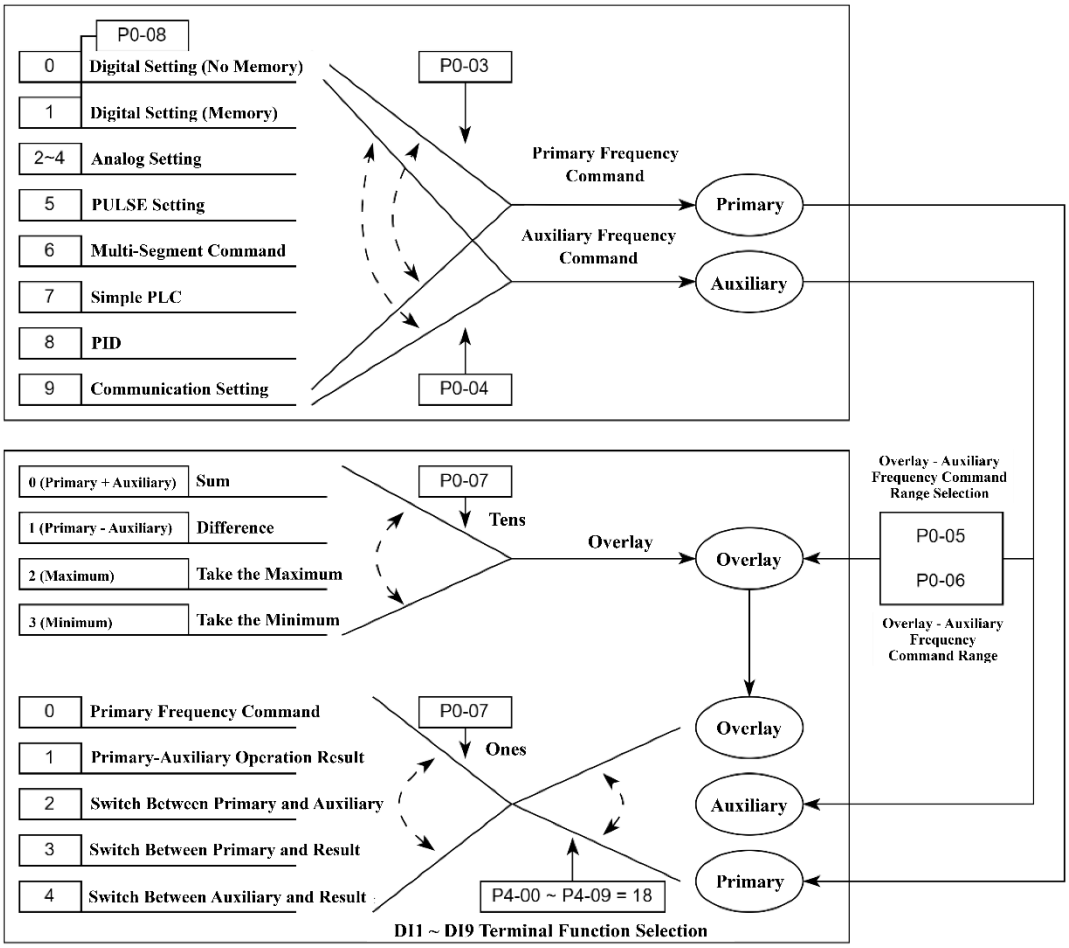


Figure 7-20. Diagram for Overlayed Primary-Auxiliary Frequency Selection

Parameter	Function Definition	Default	Setting Range
P0-07	Frequency Source Overlay Selection	00	Ones: Frequency Command Selection 0: Primary Frequency Source X 1: Primary-Auxiliary Operation Result (operation relation determined by tens) 2: Switch between Primary Frequency Source X and Auxiliary Frequency Source Y 3: Switch between Primary Frequency Source X and Primary-Auxiliary Operation Result 4: Switch between Auxiliary Frequency Source Y and Primary-Auxiliary Operation Result Tens: Primary-Auxiliary Operation Relation of Frequency Command 0: Primary Frequency Plus Auxiliary

			Frequency 1: Primary Frequency Minus Auxiliary Frequency 2: Take the Maximum 3: Take the Minimum
P0-05	Auxiliary Frequency Source Y Range Selection (Overlay)	0	0: Relative to Maximum Frequency 1: Relative to Frequency Source X
P0-06	Auxiliary Frequency Source Y Range (Overlay)	100%	0% ~ 150%

When setting the overlayed primary-auxiliary frequency, note the following:
1. When the auxiliary frequency command is subject to digital setting, the preset frequency (P0-08) does not apply. Any frequency adjustment made by the user through the keypad (or the UP/DOWN button on the multi-functional input terminals) are on the direct basis of the primary set frequency.
2. When the auxiliary frequency command is subject to AI setting (AI1, AI2, AI3) or pulse input setting, the set percentage corresponds to the auxiliary frequency range, which can be set via P0-05 and P0-06.
3. The primary and auxiliary frequency command selections cannot be on the same channel, indicating that P0-03 and P0-04 should not be set to the same value, otherwise a disorder may arise.
4. The overlay of primary-auxiliary frequency commands can be used for applications requiring closed-loop speed control, such as applying the primary frequency channel as the main part and the auxiliary frequency channel for automatic fine tuning, supported with switching of external DI terminal signals.

7.1.2.11 Operating Command Binding to Primary Frequency Command

By setting parameter P0-27, you can specify the frequency instruction for 3 running commands of the AC driver. The running command channel and the primary frequency setting channel are subject to arbitrary binding and synchronous switch. This feature defines the binding combinations of 3 running command channels and 9 frequency setting channels.
When the specified command channel (P0-02) sets a frequency binding channel (corresponding to P0-27), Parameter P0-03 is ineffective, and the frequency setting channel is determined by P0-27. The setting diagram is as follows:

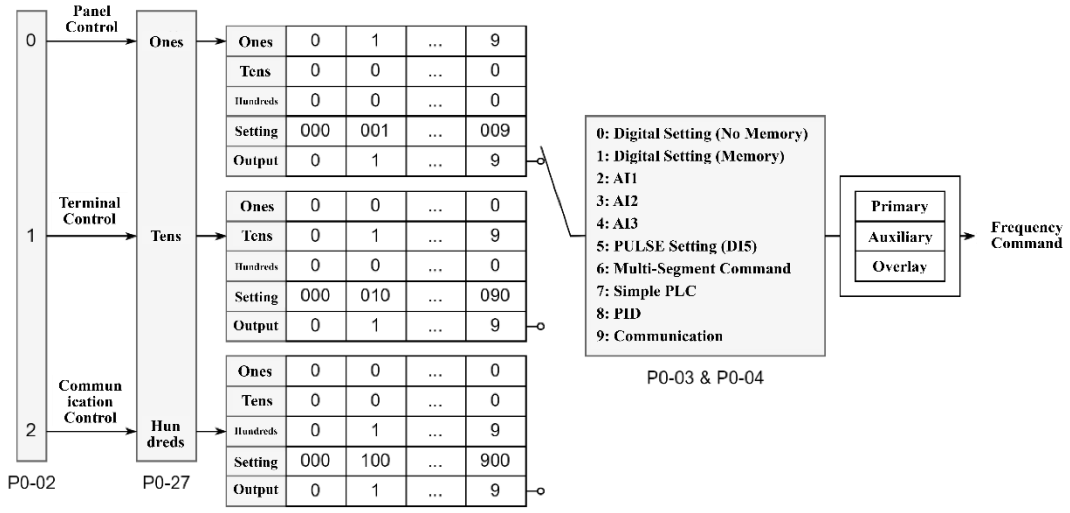


Figure 7-21. Diagram for Operating Command Binding to Primary Frequency Command

Parameter	Function Definition	Default	Setting Range
P0-27	Command Source Binding to Frequency Source	000	Ones: Operation Panel Command Binding to Frequency Source Selection 0: No Binding 1: Digital Setting Frequency 2: AI1 3: AI2 4: AI3 5: PULSE Setting (DI5) 6: Multi-Segment Speed 7: Simple PLC 8: PID 9: Communication Tens: Terminal Command Binding to Frequency Source Selection Hundreds: Communication Command Binding to Frequency Source Selection

7.1.2.12 Frequency Command Limit Setting

Maximum Frequency: Restricts the highest output frequency of the AC driver.
Upper Limit Frequency Source: Used to choose the upper limit frequency setting channel.
Upper Limit Frequency: Refers to the highest frequency that the motor is not allowed to exceed.
Upper Frequency Offset: Used to set the offset of the upper limit frequency.
Relevant Parameters: P0-10 ~ P0-13

7.1.2.13 "Below Lower Limit Frequency" Action Setting

Lower Limit Frequency: Refers to the lowest frequency that the motor is not allowed to exceed. If the AC driver's set frequency is lower than the lower frequency (P0-14), you need to set Parameter P8-14 to further define the AC driver's operation state. Options include running at the lower limit frequency or zero speed and stopping running.

Parameter	Function Definition	Default	Setting Range
P8-14	"Frequency Below Lower Limit Frequency" Running Mode	0	0: Run at Lower Limit Frequency 1: Stop 2: Run at Zero Speed

7.1.3 Start/Stop Setting

7.1.3.1 Start Modes

The AC drive has 4 start modes: direct start, speed tracking restart, pre-excitation start, and SVC quick start. Setting Parameter P6-00 to choose the start mode of the AC driver.

Direct Start

Set Parameter P6-00 to 0 for direct start, suitable for most loads.

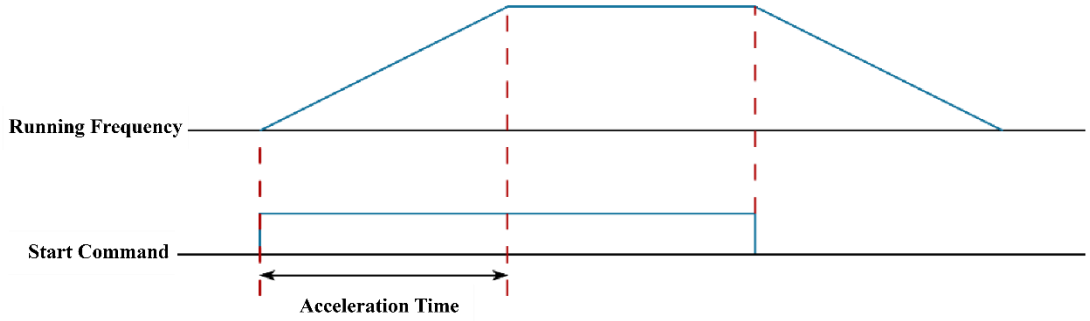


Figure 7-22. Sequence Diagram for Direct Start

Adding a "start frequency" before startup is suitable for lifting loads like elevators and cranes.

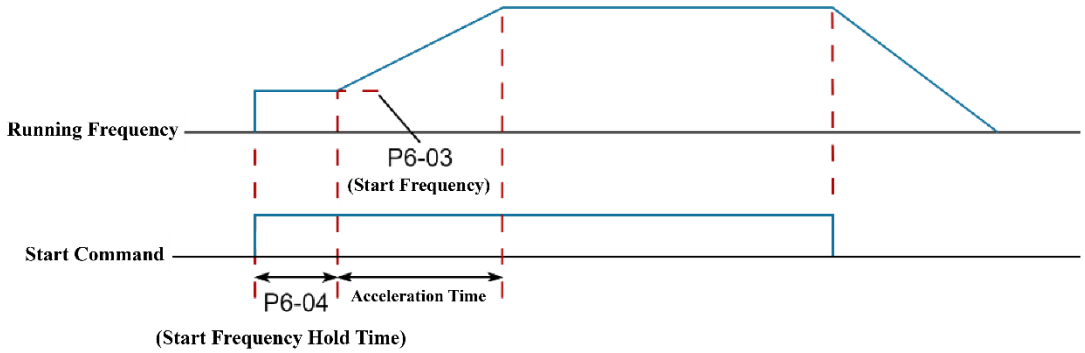


Figure 7-23. Sequence Diagram for Startup with a Start Frequency

Adding “DC braking” before startup is suitable for most small inertia loads where the motor might be rotating at startup.

If the “DC braking” time is set to 0, the AC drive starts running from the start frequency; if the “DC braking” time is not 0, it first applies DC braking and then starts from the start frequency.

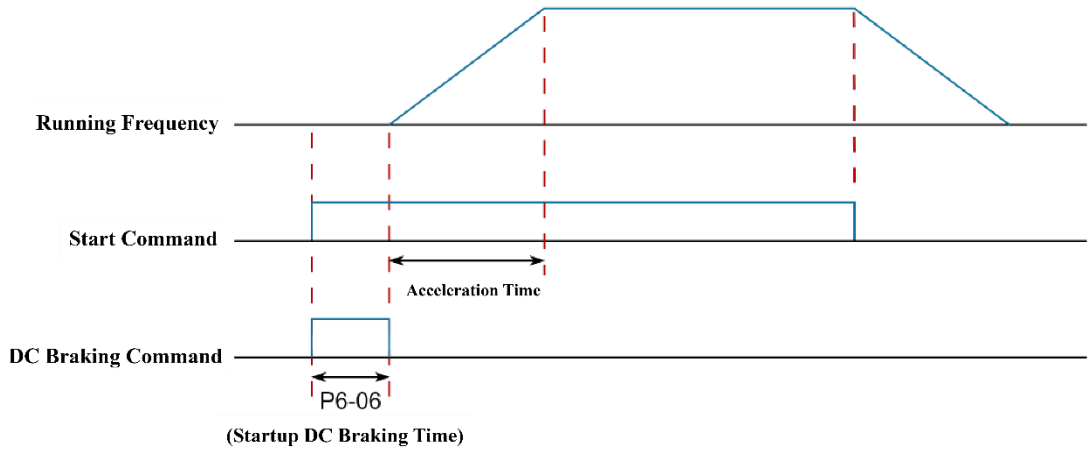


Figure 7-24 Sequence Diagram for Startup with DC Braking

The “DC braking” process before startup is suitable for driving loads like elevators and cranes. The “start frequency” is applicable for devices requiring a torque impulse to start, such as cement mixers. The frequency curve during startup is shown below:

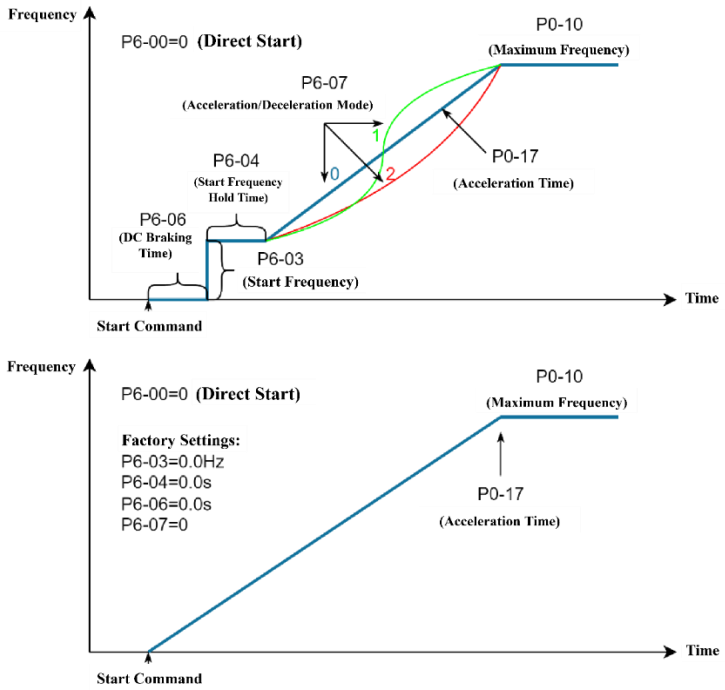


Figure 7-25 Direct Start Mode

Speed Tracking Restart

Speed tracking is effective for vector control. Set Parameter P6-00 to 1 for speed tracking restart (the AC drive first judges the speed and direction of the motor, then starts at the tracked frequency). Suitable for driving large inertia mechanical loads.

If the AC drive needs to restart while the load motor is still rotating due to inertia, use speed tracking restart to avoid overcurrent during startup. This start mode is only valid under vector control mode. The frequency curve during startup is shown below:

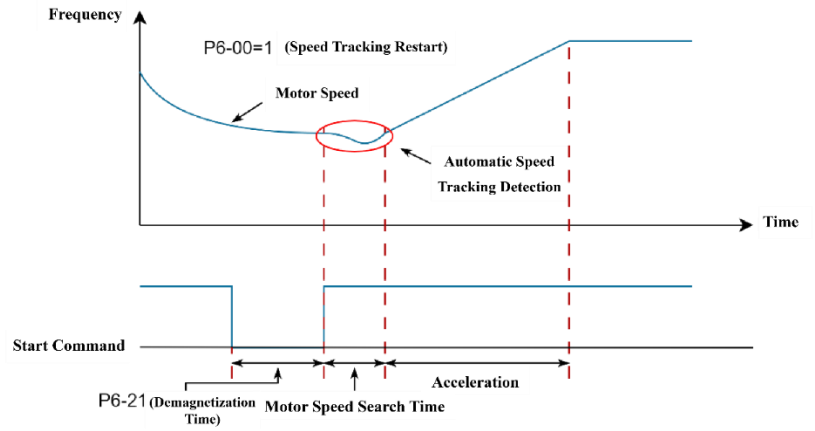


Figure 7-26 Speed Tracking Restart Mode

For restarting a motor that is still rotating at high speeds, speed tracking restart is recommended. The precondition is that the acceleration/deceleration mode is set to linear acceleration/deceleration (P6-07=0).

Pre-Excitation Start

Set Parameter P6-00 to 2 for pre-excitation start, applicable only for SVC and FVC control modes in induction AC asynchronous motors. Pre-exciting the motor before startup can improve the rapid response characteristics of the motor and reduce the starting current, suitable for applications requiring shorter acceleration times. The start sequence is consistent with DC braking restart.

SVC Quick Start

Set Parameter P6-00 to 3, applicable only for SVC control mode in induction motors. SVC quick start can shorten the acceleration time. When the system has significant inertia and requires quick startup, it is available to enable this mode, yet with torque impact.

VF Bidirectional Sweeping

Set Parameter P6-00 to 4, applicable only for VF control mode in induction motors. VF bidirectional sweeping can shorten the acceleration time. When the system has significant inertia and requires quick startup, it is available to enable this mode, yet with torque impact.

7.1.3.2 Start Frequency

To ensure the torque when starting, set an appropriate start frequency. To establish sufficient magnetic flux when the motor starts, maintain the start frequency for a certain period.

The start frequency P6-03 is not subject to the lower limit frequency. However, if the set target frequency is lower than the start frequency, the AC drive does not start but remains in standby mode.

During positive/negative rotation switching, Parameter P6-04 is not applicable. The start frequency hold time is not included in the acceleration time but is included in the running time of the simple PLC.

7.1.3.3 Stop Modes

The AC drive has two stop modes: deceleration stop and free stop. Set Parameter P6-10 to choose the stop mode of the AC driver.

Deceleration Stop

Set Parameter P6-10 to 0 for deceleration stop. When the stop command takes effect, the AC drive lowers the output frequency according to the deceleration time until the frequency drops to 0, at which point the AC drive stops.

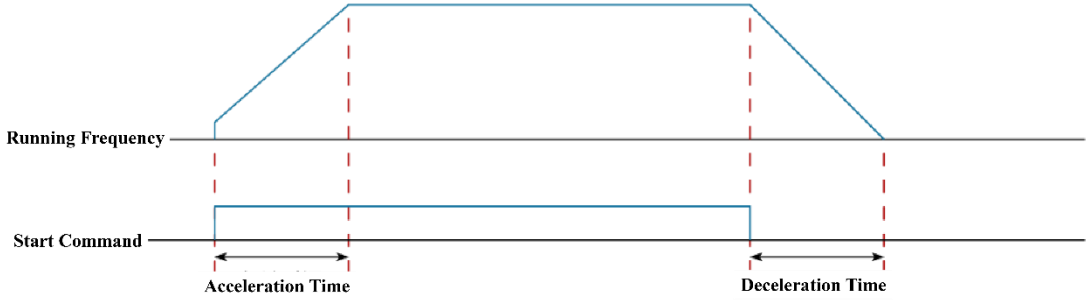


Figure 7-27. Sequence Diagram for Deceleration Stop

Free Stop

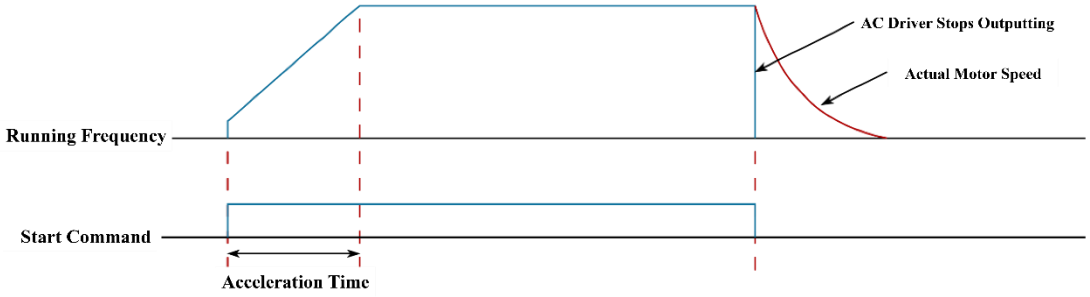


Figure 7-28. Sequence Diagram for Free Stop

7.1.3.4 DC Braking During Shutdown

Set Parameters P6-11 (DC braking start frequency), P6-12 (DC braking wait time), P6-13 (DC braking current), and P6-14 (DC braking time) to choose whether to use DC braking at the end of the stop sequence.

When the running frequency drops to the set value of P6-11, the AC drive stops outputting for a period according to P6-12. DC braking begins after this wait time. This feature can prevent potential overcurrent faults when starting DC braking at high speeds.

For P6-13 Relative Base Value:

1. When the motor's rated current is less than or equal to 80% of the AC driver's rated current, the relative base value is based on the rated current of the motor;
2. When the motor's rated current is greater than 80% of the rated current of the AC driver's rated current, the relative base value is based on 80% of the rated current of the AC driver.

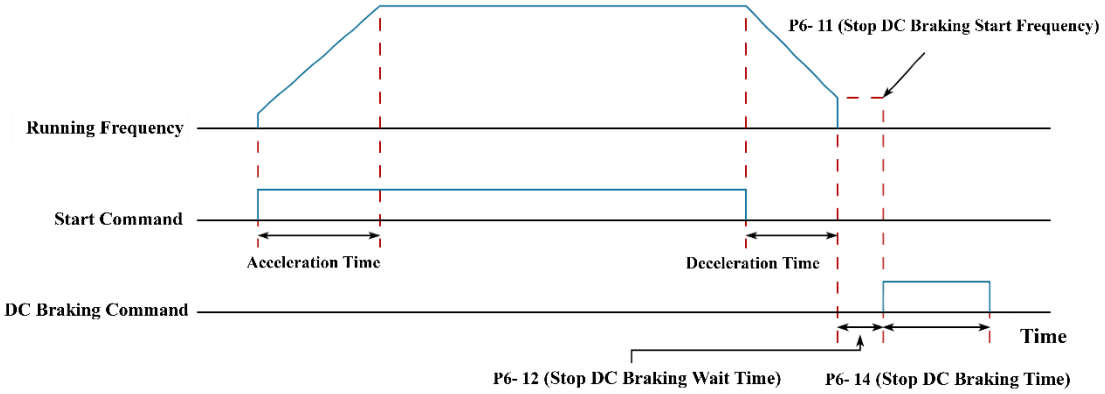


Figure 7-29. Sequence Diagram for DC Braking During Shutdown

7.1.3.5 Acceleration/Deceleration Time Setting

Acceleration time refers to the time required for the AC drive to accelerate from zero frequency to P0-25 (acceleration/deceleration reference frequency). Deceleration time refers to the time required for the AC drive to decelerate from P0-25 (acceleration/deceleration reference frequency) to zero frequency.

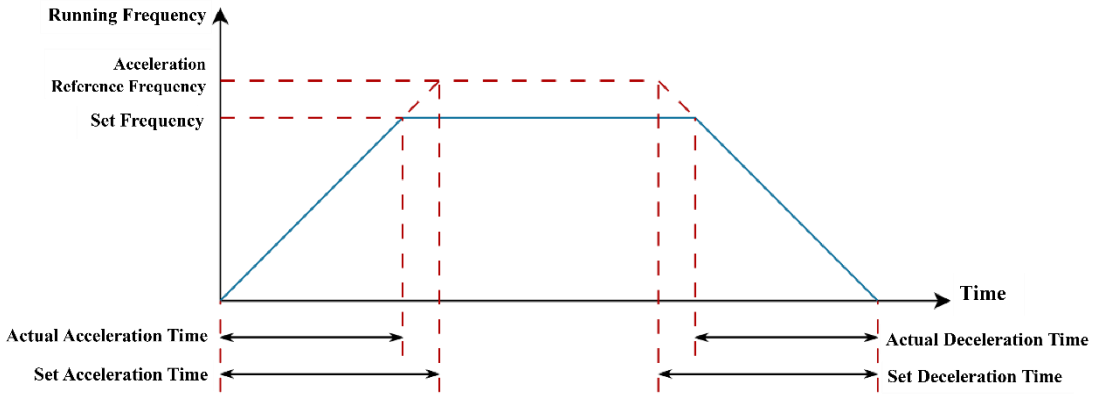


Figure 7-30. Diagram for Acceleration/Deceleration Times

The AC drive provides 4 groups of acceleration/deceleration time. Users can switch among them using digital input terminals DI (Terminal Functions 16 and 17). The 4 groups of acceleration/deceleration time are set through the following parameters:

Group 1: P0-17 and P0-18

Group 2: P8-03 and P8-04

Group 3: P8-05 and P8-06

Group 4: P8-07 and P8-08

Application Example

In the case of using Terminals DI1 and DI2 as input switching terminals, the detailed setting process is as follows:

Step 1: Set Parameters P4-06 and P4-07 to select DI1 and DI2 as input switching terminals;

Parameter	Function Definition	Set Value	Function Description
P4-00	DI1 Terminal Function Selection	16	Acceleration/Deceleration Time Selection Terminal 1
P4-01	DI2 Terminal Function Selection	17	Acceleration/Deceleration Time Selection Terminal 2

Step 2: Set the four groups of acceleration/deceleration time parameters to set the corresponding acceleration/deceleration times;

DI2 Terminal State	DI1 Terminal State	Acceleration/Deceleration Time Selection
OFF	OFF	Group 1: P0-17 and P0-18 (Acceleration Time 1)
OFF	ON	Group 2: P8-03 and P8-04 (Acceleration Time 2)
ON	OFF	Group 3: P8-05 and P8-06 (Deceleration Time 1)
ON	ON	Group 4: P8-07 and P8-08 (Deceleration Time 1)

Step 3: Set Parameter P0-19 (acceleration/deceleration time unit). When modifying this parameter, the decimal places of the 4 groups of acceleration/deceleration time will change accordingly, as will the acceleration/deceleration time values. Please pay special attention when applying;

Step 4: Set Parameter P6-07 (acceleration/deceleration mode) to select the frequency variation mode during startup and shutdown of the AC driver:

● 0: The output frequency increases or decreases linearly.

● 1: In the case of a fixed target frequency, the output frequency increases or decreases along an S-curve. Suitable for applications requiring smooth startup or shutdown, such as elevators and conveyors.

● 2: In the case of real-time dynamic changes in the target frequency, the output frequency increases or decreases along an S-curve in real-time. Suitable for applications requiring high comfort and fast real-time response.

Step 5: Set Parameters P6-08 and P6-09 to set the time ratios of the initial and final segments of the S-curve. In this case, Parameters P6-08 and P6-09 must satisfy: P6-08 + P6-09 ≤ 100.0%.

7.2 Motor Configuration

7.2.1 Motor Tuning

Motor tuning is the process by which the AC drive obtains the parameters of the controlled motor. There are 5 modes of motor tuning (set via Parameter P1-37):

Tuning Mode	Characteristic	Application	Effect
Asynchronous Motor Static Partial Tuning	Only identifies some motor parameters	Suitable for cases where the motor and load are difficult to separate	Good
Asynchronous Motor Dynamic Complete Tuning	Identifies all motor parameters (requiring the validation of encoder parameters under FVC control mode)	Suitable for cases where the motor and load are easy to separate	Optimal
Asynchronous Motor Static Complete Tuning	Identifies all motor parameters	Suitable for cases where the motor and load are difficult to separate	Better
Synchronous On-Load Tuning	Identifies all motor parameters	Suitable for cases where the motor and load are difficult to separate	Better
Synchronous No-Load Tuning	Identifies all motor parameters	Suitable for cases where the motor and load are easy to separate	Optimal

In addition to the 5 modes above, motor parameters can also be entered manually.

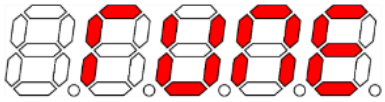
Motor tuning can be performed through the operation panel by giving a running command, as well as through a communication command. Set P0-02 to select the running command source. Modbus, Profibus, and CANopen PKW support communication tuning, while PZD does not support communication tuning. The process of communication tuning includes writing the tuning parameter into P1-37/A2-37 and then writing the running command.

Application Example

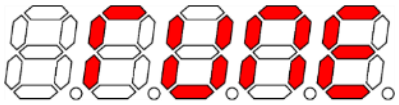
Here is an example of the motor tuning method using the parameters of Motor 1 (P0-24 = 0, Motor Parameter Group 1). If you want to tune Motor 2, set P0-24 to 1 (Motor Parameter Group 2), and the following tuning steps are similar to that of Motor 1. Refer to Group A2 for related parameters.

● Asynchronous Motor Static Partial Tuning

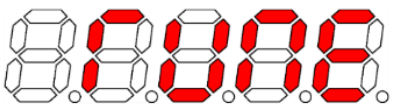
Step	Description
1	After powering on, set the AC driver's running command source to the operation panel (P0-02 = 0).
2	Enter the motor's nameplate parameters (P1-00 ~ P1-05).

3	Set Parameter P1-37 to 1, and press ENTER to confirm. The keypad displays: 
4	After pressing RUN on the operation panel, the motor does not rotate, but the AC drive energizes the motor, and the operation indicator turns on. When the display information disappears and returns to the normal parameter, the tuning is complete. After this tuning process, the AC drive automatically calculates the values of P1-06 ~ P1-08.

● Asynchronous Motor Dynamic Complete Tuning

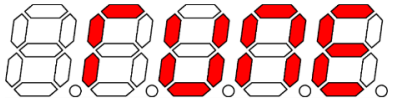
Step	Description
1	After powering on, set the AC driver's running command source to the operation panel (P0-02 = 0).
2	Enter the motor's nameplate parameters (P1-00 ~ P1-05).
3	Enter the encoder parameters (P1-27, P1-28, P1-30, and P1-34).
4	Set Parameter P1-37 to 2, and press ENTER to confirm. The keypad displays: 
5	After pressing RUN on the operation panel, the AC drive drives the motor to accelerate/decelerate, rotate in either direction, the operation indicator turns on, and the tuning operation lasts for a certain period. When the display information disappears and returns to the normal parameter, the tuning is complete. After this tuning process, the AC drive automatically calculates the values of P1-06 ~ P1-10 and P1-30.

● Asynchronous Motor Static Complete Tuning

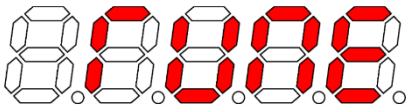
Step	Description
1	After powering on, set the AC driver's running command source to the operation panel (P0-02 = 0).
2	Enter the motor's nameplate parameters (P1-00 ~ P1-05).
3	Set Parameter P1-37 to 3, and press ENTER to confirm. The keypad displays: 
4	After pressing RUN on the operation panel, the motor does not rotate, but the AC drive energizes the motor, and the operation indicator turns on.

	When the display information disappears and returns to the normal parameter, the tuning is complete. After this tuning process, the AC drive automatically calculates the values of P1-06 ~ P1-10.

● Synchronous On-Load Tuning

Step	Description
1	After powering on, set the AC driver's running command source to the operation panel (P0-02 = 0).
2	Enter the motor's nameplate parameters (P1-00 ~ P1-05).
3	Set Parameter P1-37 to 11, and press ENTER to confirm. The keypad displays: 
4	After pressing RUN on the operation panel, the motor does not rotate, but the AC drive energizes the motor, and the operation indicator turns on. When the display information disappears and returns to the normal parameter, the tuning is complete. After this tuning process, the AC drive automatically calculates the values of P1-16 ~ P1-18 and P1-20.

● Synchronous No-Load Tuning

Step	Description
1	After powering on, set the AC driver's running command source to the operation panel (P0-02 = 0).
2	Enter the motor's nameplate parameters (P1-00 ~ P1-05).
3	Set Parameter P1-37 to 12, and press ENTER to confirm. The keypad displays: 
4	After pressing RUN on the operation panel, the AC drive drives the motor to accelerate/decelerate, rotate in either direction, the operation indicator turns on, and the tuning operation lasts for a certain period. When the display information disappears and returns to the normal parameter, the tuning is complete. After this tuning process, the AC drive automatically calculates the values of P1-16 ~ P1-18 and P1-20.

7.2.2 Second Motor Parameters

WD400 supports switching between 2 groups of motor parameter: Motor 1 parameters correspond to Parameter Group P1; Motor 2 parameters correspond to Parameter Group A2. Switching between the first and second motor parameters can be realized in two ways:

1. Select the currently valid motor parameter group via Parameter P0-24. Set P0-24 to 0 to choose Motor Parameter Group 1; set P0-24 to 1 to choose Motor Parameter Group 2.
2. Select the currently valid motor parameter group via DI terminal function selection. Any of the DI1 to DI10 (P4-00 to P4-09) terminals can be set to 41 (motor selection terminal). If the DI terminal is inactive, Motor Parameter Group 1 is selected; if the DI terminal is active, Motor Parameter Group 2 is selected.

If any of the P4-00 to P4-09 terminals is set to 41, the DI terminal takes priority in determining which motor is selected, regardless of Parameter P0-24. Only when none of the P4-00 to P4-09 terminals are set to 41 does the motor selection depend on P0-24.

Switching between the 2 motor parameter groups is not permitted during operation. If motor switching is necessary, the AC drive must be stopped first, otherwise, the AC drive will report an Err49 fault.

7.2.3 Motor Control Mode Selection

The motor control mode is selected via Parameter P0-01. Set Parameter P0-01to 0 for sensorless vector control (SVC); set to 1 for field-oriented vector control (FVC); set to 2 for V/F control (speed open-loop control). The 3 motor control modes are suitable for the following scenarios:

● Sensorless Vector Control (SVC): Open-loop vector control suitable for high-performance control applications, where a single AC drive can only control one motor. Examples include machine tools, centrifuges, wire drawing machines, and injection molding machines.

● Field-Oriented Vector Control (FVC): Closed-loop vector control requiring an encoder on the motor and a PG card matching the encoder type on the AC driver. Suitable for applications demanding high precision in speed control or torque control, where a single AC drive can only control one motor. Examples include high-speed papermaking machinery, hoisting machinery, and elevators.

● V/F Control (Speed Open-Loop Control): Suitable for applications with low load requirements or where a single AC drive controls multiple motors, such as fans and pumps.

7.3 Control Interface

7.3.1 Digital Input and Output Terminals

Digital Input (DI) Terminal Function

WD400 comes standard with either 5 or 7 (depending on the model) multi-functional digital input terminals (including DI5 which can be used as a high-speed pulse input terminal). If additional digital input terminals are needed, an optional IO expansion card can be selected. The functions of DI terminals can be defined by setting Parameters P4-00 ~ P4-09.

Digital Output (DO) Terminal Function

WD400 comes standard with 1 multi-functional digital output terminal (DO1), 1 or 2 (depending on the model) multi-functional relay output terminals (TA/TB/TC), and 1 FM terminal. FM and

DO1 are subject to transistor-type outputs capable of driving 24V DC low-voltage signal circuits; TA/TB/TC are relay outputs capable of driving 250V AC control circuits. If additional digital output terminals are needed, an optional IO expansion card can be selected. The functions of DO terminals can be defined by setting Parameters P5-00 ~ P5-06.

Terminal	Parameter	Output Characteristic
FM-COM	P5-06 (P5-00=0)	Transistor (to output high-frequency pulses): 10Hz ~ 100kHz; Drive Capability: 24V DC, 50mA
	P5-01 (P5-00=1)	Transistor, Drive Capability: 24V DC, 50mA

Terminal Name	Parameter	Output Characteristic
TA1/TB1/TC1	P5-02	Relay, Drive Capability: 250V AC, 3A
TA2/TB2/TC2	P5-03	Relay, Drive Capability: 250V AC, 3A (IO Expansion Card or High-power Model)
DO1-COM	P5-04	Transistor, Drive Capability: 24V DC, 50mA
DO2-COM	P5-05	Transistor, Drive Capability: 24V DC, 50mA (IO Expansion Card)

7.3.2 Analog Input Terminals

WD400 comes standard with 2 analog input terminals (AI1 and AI2). If the analog input terminals are insufficient for the application, an optional IO expansion card can be selected.

Terminal	Name	Type	Input Range	Input Impedance
AI1-GND	Analog Input Terminal 1	Voltage Type (P4-40 bit0=0)	0V DC ~ 10V DC	100kΩ
		Current Type (P4-40 bit0=1)	0mA ~ 20mA	500Ω
AI2-GND	Analog Input Terminal 2	Voltage Type (P4-40 bit1=0)	0V DC ~ 10V DC	100kΩ
		Current Type (P4-40 bit1=1)	0mA ~ 20mA	500Ω

Application Example

Step	Parameter	Description	
1. AI Terminal Selection: Choose the AI input terminal for frequency commands based on the terminal characteristics.	P0-03	P0-03=2	Choose AI1
		P0-03=3	Choose AI2
		P0-03=4	Choose AI3
2. Curve Selection for AI	P4-33	Generally, use the default value	

Voltage(1) and Frequency: Choose any one of the 5 curves.		P4-33=321, where AI1 uses Curve 1, AI2 uses Curve 2, and AI3 uses Curve 3.	
3. Curve Setting for AI Voltage(1) and Frequency: Define the relationship between the AI voltage input and set value.	P4-13 ~ P4-16(2)	Curve 1 Setting	Typical Curve Setting(3)
	P4-18 ~ P4-21	Curve 2 Setting	Typical Curve Setting(4)
	P4-23 ~ P4-27	Curve 3 Setting	Typical Curve Setting(4)
	A6-00 ~ A6-07	Curve 4 Setting	
	A6-08 ~ A6-15	Curve 5 Setting	
	P4-34	AI Below Minimum Input Selection(2)	
	P0-10	When AI is used as the frequency reference, the voltage/current input corresponds to 100.0% of the maximum frequency P0-10.	
4. AI Filter Time	P4-17	Default is 0.1s. Set this parameter according to the need for rapid response and the interference of the on-site signal. Reduce this parameter for faster response requirements; increase it for greater interference at the site.	

(1) For current-type analog inputs, 1mA current corresponds to 0.5V voltage, and 20mA corresponds to 10V.

(2) When the analog input voltage exceeds P4-15 (maximum input), the analog voltage is calculated as the maximum input; similarly, when the analog input voltage is less than P4-13 (minimum input), it is calculated according to the setting of P4-34 (AI below minimum input selection), either P4-13 or 0.0%.

(3) The typical curve settings for AI1 are shown in the following figures:

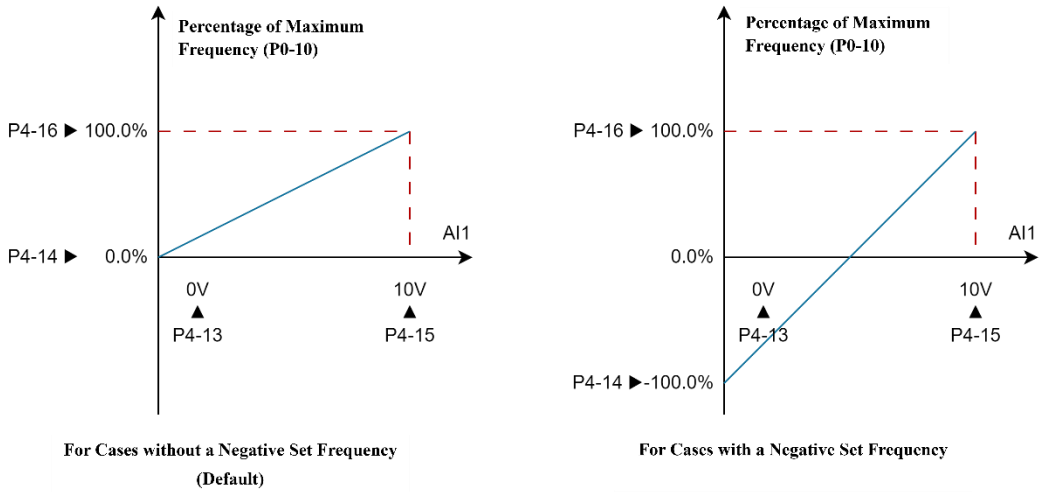


Figure 7-31. Voltage-Type AI1 Typical Curve Setting

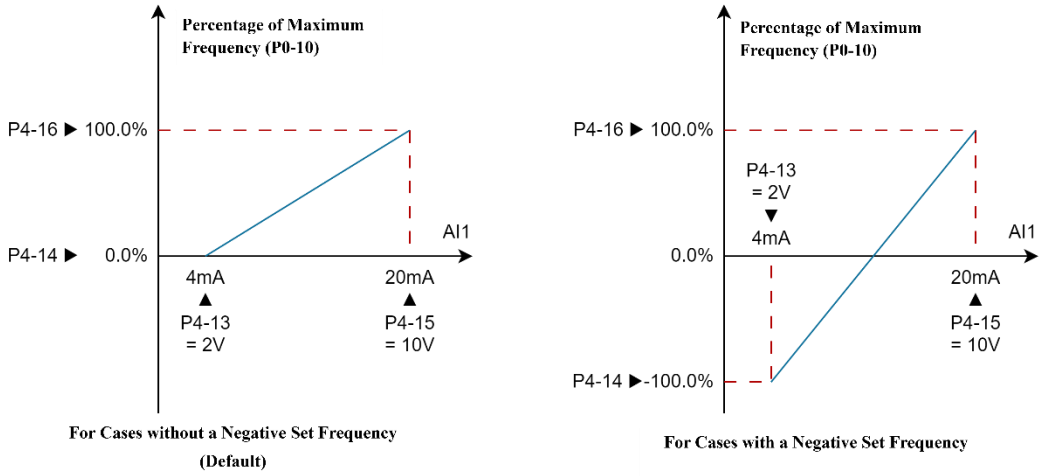


Figure 7-32. Current-Type AI1 Typical Curve Setting

(4) The typical set curve settings for AI2 and AI3 are the same as for AI1.

7.3.3 Analog Output Terminals

WD400 comes standard with 1 or 2 (depending on the model) analog output terminals. If the standard analog output terminals do not satisfy the field application, an optional IO expansion card can be selected.

AO1 and AO2 can be used to indicate internal running parameters in analog form. The indicated parameters can be selected via Parameters P5-07 and P5-08.

Using the AO output curve, zero drift and deviation in output amplitude of the analog output can be corrected. If the zero drift is denoted by b, the gain by k, the actual output by Y, and the standard output by X, then the actual output is Y=kX+b.

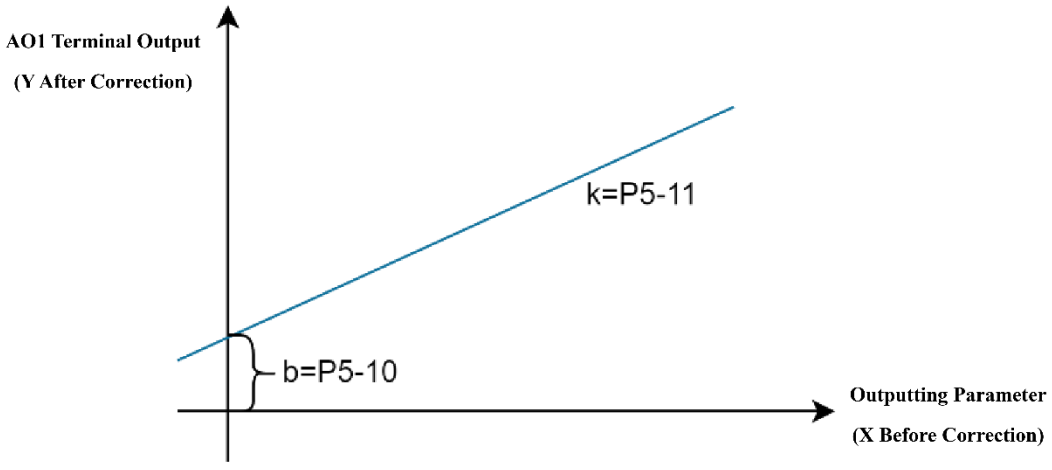


Figure 7-33. AO Signal Correction Characteristic Curve

The zero drift coefficient 100% corresponds to 10V (or 20mA). Zero drift = zero drift coefficient × 10V (or 20mA). Standard output refers to the quantity represented by the analog output 0V~10V (or 0mA~20mA) when there is no zero drift and gain correction.

Related Parameters

P5-07 ~ P5-08 and P5-10 ~ P5-13

These parameters are generally used to correct the zero drift and output amplitude deviation of the analog output and define the required AO output curve.

Application Example

Analog output 0V ~ 10V (0mA ~ 20mA) corresponds to 0% ~ 100%.

When the AO output function is 1 (set frequency), if the set frequency is 50% of the maximum frequency, the gain is set to 1.00, and the zero drift coefficient is set to 0.0%, then the AO output voltage is 10V × 50% = 5V.

When the AO output function is 0 (running frequency), if it is desired that the output be 8V at a frequency of 0Hz, and 4V at a frequency of 40Hz, the gain and zero drift coefficient can be calculated according to the equations below.

Equation for the gain:

$$K = \frac{(Y1 - Y2) * Xmax}{(X1 - X2) * Ymax}$$

Equation for the zero drift:

$$b = \frac{(X1 * Y2) - (X2 * Y1)}{(X1 - X2) * Ymax} * 100\%$$

where, the frequency 0Hz, Y1 is the output 8V, X2 is the frequency 40Hz, Y2 is the output 4V, Xmax is the maximum output frequency (P0-10) 50Hz, Ymax is the maximum output voltage 10V. According to the equations, the AO gain should be set to -0.5, and the AO zero drift coefficient should be set to 80%.

Analog Output Content	Maximum Value (Xmax)
0: Running Frequency	Maximum Output Frequency (P0-10)
1: Set Frequency	Maximum Output Frequency (P0-10)
2: Output Current	Twice the Rated Motor Current
3: Output Torque (Absolute Value)	Twice the Rated Motor Torque
4: Output Power	Twice the Rated Motor Power
5: Output Voltage	1.2 Times the Rated Motor Voltage
6: PULSE Input	100.0kHz
7: AI1	10V
8: AI2	10V
9: AI3	10V
10: Length	Maximum Set Length (PB-05)
11: Count Value	Maximum Count Value (PB-08)
12: Communication Setting	AO Communication Setting
13: Motor Speed	Maximum Output Frequency (P0-10)

14: Output Current	1000.0A
15: Output Voltage	1000.0V
16: Output Torque (Actual Value)	Twice the Rated Motor Torque
17：Actual Output Torque	Twice the Torque Upper Limit

Output Signal Type	Maximum Value (Ymax)
Voltage	10V
Current	20mA

7.3.4 Digital Pulse Input (DI5)

Frequency commands are given via the high-speed pulse input on Terminal DI5. Specifications for the pulse command signal include voltage range 16.8V ~ 31.2V and frequency range 0kHz ~ 100kHz.

Application Example

Step	Parameter	Description
1. Select Digital Pulse Input (DI5) as Frequency Command	P0-03、P4-04	Set P0-03=5 to choose pulse setting (DI5) as the primary frequency command. Set P4-04=30 to select DI5 terminal function selection as the pulse frequency input.
2. Set the Relationship Curve Between Pulse Frequency and Set Frequency	P4-28 ~ P4-31	Typical Curve Setting(1)
3. Set Maximum Frequency	P0-10	When pulse input is used as the frequency command, the 100.0% set value corresponds to the maximum frequency (P0-10).
4. Set PULSE Filter Time	P4-32	Set the PULSE filter time to prevent signal interference.

(1) The typical curve setting when digital pulse input is used as a frequency command is shown in the figure below:

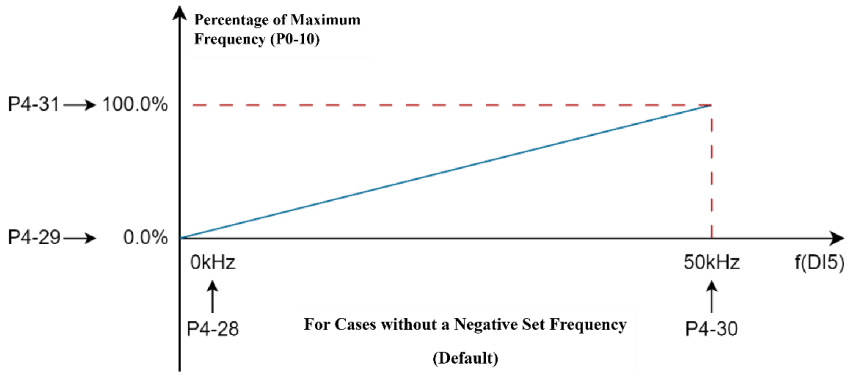


Figure 7-34. Typical Curve Setting When DI5 Serves as a Frequency Command

7.3.5 Pulse Output Terminal (FM)

FM (pulse output) 0 ~ 100kHz (P5-09) corresponds to 0% ~ 100%. When the FM output function is 1 (set frequency), if the set frequency of the AC drive is 50% of the maximum frequency, and P5-09 is set to 100kHz, then the output frequency of the FM terminal is 100kHz × 50% = 50kHz.

Related Parameters
P5-00, P5-06, and P5-09

7.4 Control Performance

7.4.1 Overcurrent Control

Overcurrent Stall

During acceleration, constant speed, and deceleration, if the current exceeds the overcurrent stall action current, the overcurrent control function will suppress excessive current. When the current exceeds the overcurrent stall action current, the output frequency is reduced until the current returns below the stall point, and the frequency begins to accelerate towards the target frequency, automatically lengthening the acceleration time. If the actual acceleration time does not satisfy the application, the overcurrent stall action current can be appropriately increased.

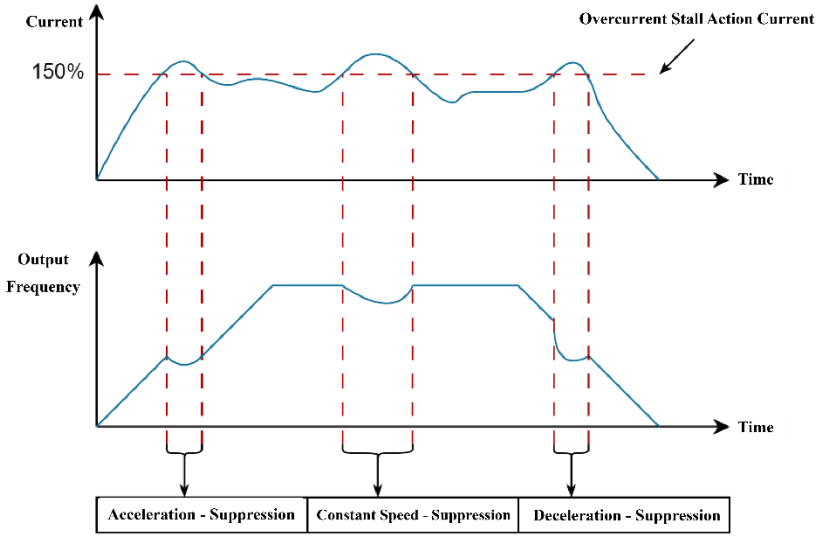


Figure 7-35. Overcurrent Stall Action Diagram

Multi-Speed Overcurrent Stall

In the high-frequency region, the motor's drive current is relatively small. Compared with the region where the running frequency is lower than the rated frequency, the same stall current can cause a significant speed drop in the motor. To improve the operating characteristics of the motor, the stall action current setting for the region where the running frequency is higher than the rated frequency can be reduced. In applications such as centrifuges, where the operating frequency is high, multiple weak magnetic fields are required, and the load inertia is large, this method can significantly enhance the acceleration performance and effectively prevent motor stalling.

$$\text{Overcurrent Stall action Current that Exceeds the Rated Frequency} = \frac{\text{fn}}{\text{fs}} * \text{k} * \text{LimitCur}$$

where, fs is the operating frequency, fn is the motor's rated frequency, k is P3-21 (high-speed overcurrent stall action current compensation coefficient), and LimitCur is P3-18 (overcurrent stall action current).

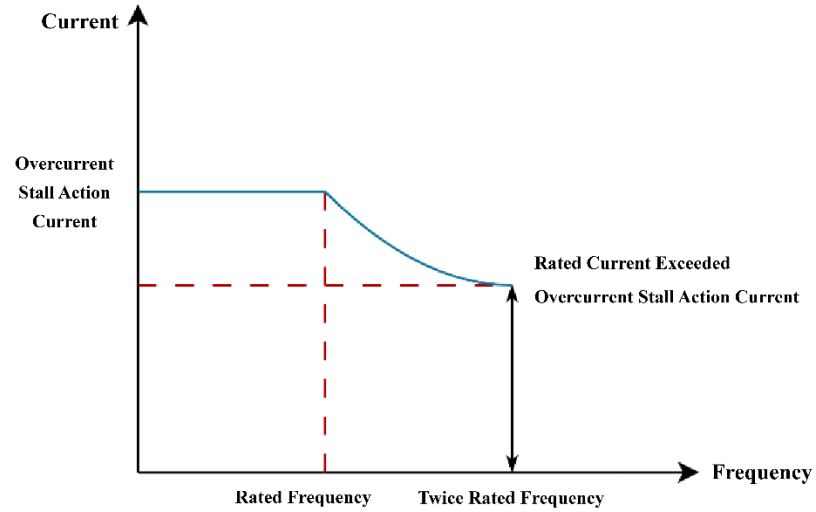


Figure 7-36. High-Speed Overcurrent Stall Action Diagram

For motors with a power higher than 55kW and a carrier frequency lower than 2kHz, please reduce the overcurrent stall action current value (P3-18) to avoid insufficient torque due to the activated cycle-by-cycle current limit function.

Related Parameters
P3-18 ~ P3-21

7.4.2 Overvoltage Control

When the bus voltage reaches the overvoltage stall action voltage setpoint, the actual speed of the motor is greater than the speed corresponding to the inverter's output frequency, indicating the motor is in a generating state. To protect system safety and avoid tripping protection, the inverter initiates the overvoltage stall protection function, reducing the output frequency, which automatically lengthens the actual deceleration time. If the actual deceleration time does not meet the system requirements, the excitation gain can be appropriately increased.

Related Parameters
P3-10, P3-11, P3-22 ~ P3-26, P9-03 ~ P9-04, and P9-08

When using and adding braking resistors, or using energy feedback units, please note:
● Set P3-10 (over-excitation gain) value to 0, otherwise it may cause excessive current during operation.
● Set P3-23 (overvoltage stall enable) value to 0, otherwise it may cause extended deceleration time.

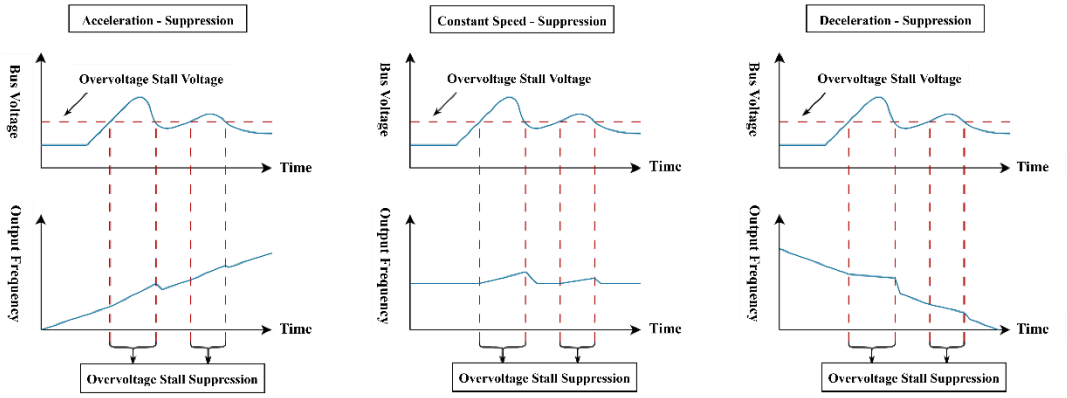


Figure 7-37. Overvoltage Stall Action Diagram

7.4.3 Speed Loop

Speed loop PI parameters are divided into a high-speed group and a low-speed group. When the running frequency is less than P2-02 (switching frequency 1), the speed loop PI regulation parameters are P2-00 (speed loop proportional gain 1) and P2-01 (speed loop integral time 1). When the running frequency is greater than P2-05 (switching frequency 2), the speed loop PI regulation parameters are P2-03 (speed loop proportional gain 2) and P3-04 (speed loop integral time 2). Between switching frequencies 1 and 2, the speed loop PI parameters are linearly switched between the two groups, as shown in the figure below:

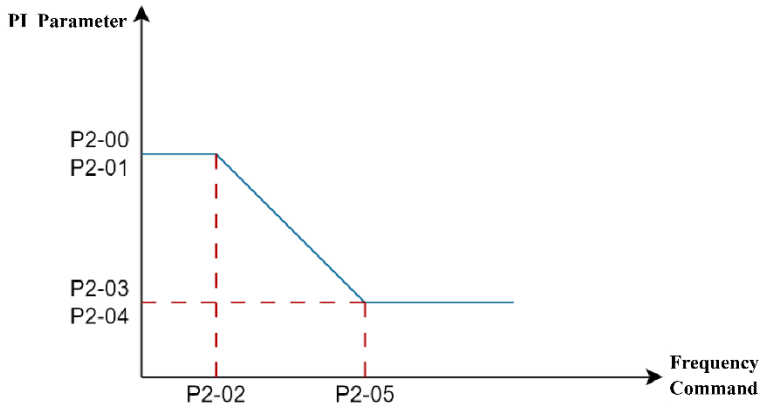


Figure 7-38. Speed Loop PI Parameter Diagram

The dynamic response characteristics of vector control can be adjusted through setting the proportional coefficient and integral time of the speed controller. Increasing the proportional gain and decreasing the integral time can both speed up the dynamic response of the speed loop; however, excessive proportional gain or too small an integral time can cause the system to oscillate.

It is recommended to perform the process: If the factory parameters do not meet the application, make minor adjustments based on the factory-set parameters. First increase the proportional gain to ensure the system does not oscillate; then decrease the integral time to achieve a fast response while minimizing overshoot.

Related Parameters
P2-00 ~ P2-05

If the PI parameters are improperly configured, it may lead to excessive speed overshoot and even an overvoltage fault during the overshoot recovery.

7.4.4 Current Loop

The vector control current loop PI regulation parameters are divided into an excitation group and a torque group. These parameters are automatically obtained after complete tuning of the asynchronous motor and generally do not require modification.
The integral controller of the current loop is not set in the dimension of integration time but rather by directly setting the integration gain. If the PI gain of the current loop is set too high, it can cause oscillation in the entire control loop. When there is significant current oscillation or torque fluctuation, the PI proportional gain or integration gain can be manually reduced.

Related Parameters
P2-13 ~ P2-16

7.4.5 Torque Upper Limit

7.4.5.1 Speed Control Torque Upper Limit

Under vector control (FVC or SVC), there are 2 control modes: speed control and torque control (A0-00), with different torque upper limits.
In speed control mode, there are 8 ways to set the torque upper limit source. During motoring state, the torque upper limit source is selected by P2-09; during generating state, the torque upper limit source is selected by P2-11. If P2-11 is set to 1 ~ 8, the torque upper limit is differentiated between motoring and generating states. In the motoring state, the full-scale torque limit is set by P2-10 (torque upper limit in motoring state is based the motor's rated current); in the generating state, the full-scale torque upper limit is set by P2-12, as shown in the figure below:

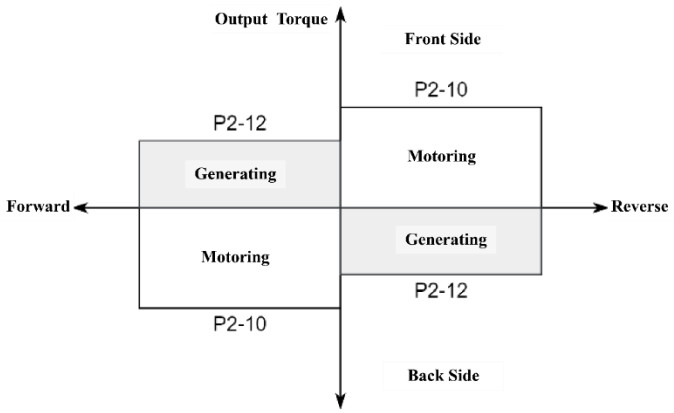


Figure 7-39 Speed Control Torque Limit Diagram

Power limitation can effectively reduce the voltage surge on the busbar during the braking process of the motor, preventing overvoltage faults. The power generation upper limit P2-23 is a percentage of the motor's rated power. If an overvoltage still occurs after enabling the power generation upper limit, continue to reduce P2-23.

Related Parameters

P2-09 ~ P2-12 and P2-22 ~ P2-23

7.4.5.2 Torque Control Torque Upper Limit

1. Speed/Torque Control Mode Setting (A0-00)

The multi-functional digital DI terminals have 2 functions related to torque control: torque control prohibition (Function 29) and speed/torque control switch (Function 46). These 2 terminals need to be used in conjunction with A0-00 to switch between speed and torque control.

● When the speed/torque control switch terminal (Function 46) is inactive, the control mode is determined by A0-00. If the function is active, the control mode is the inverse of the value set of A0-00.

● When the torque control prohibition terminal is active (Function 29), the AC drive is fixed in speed control mode.

2. Torque Setting (A0-01, A0-03) in Torque Control Mode

A0-01 is used to select the torque command, with a total of 8 torque command options.

3. Torque Control Upper Limit Frequency Setting (A0-05, A0-06)

When the AC drive is under torque control, if the load torque is less than the output torque of the motor, the motor speed will continuously increase. To prevent accidents such as runaway in the mechanical system, the maximum speed of the motor must be limited under torque control. The acceleration and deceleration times for the upper limit frequency under torque control are set via P8-07 (acceleration) / P8-08 (deceleration).

This parameter is used to set the maximum forward or reverse running frequency of the AC drive under torque control mode. To achieve dynamic continuous adjustment of the maximum frequency of torque control, use upper limit frequency control.

4. Torque Control Torque Acceleration/Deceleration Time Setting (A0-07, A0-08)

In torque control mode, the difference between the motor output torque and the load torque determines the speed change rate of the motor and the load. Therefore, the motor speed may change rapidly, causing noise or excessive mechanical stress. By setting the acceleration and deceleration times for torque control, the speed changes of the motor can be smoother.

For example, when 2 motors are rigidly connected to drive the same load, one AC drive is set as the master running speed control mode, while the other is set as the slave running torque control. The actual output torque of the master serves as the torque command for the slave. In this case, the slave needs to quickly follow the master's torque, so the acceleration and deceleration times for the slave's torque control are 0.00s.

Related Parameters

A0-00 ~ A0-01, A0-03, A0-05 ~ A0-08, P8-07 ~ P8-08, and P4-00 ~ P4-09

7.4.5.3 Vector Control Slip Gain

In SVC control mode, adjusting the slip gain of vector control can improve the steady speed accuracy of the motor. For example, when the motor speed is lower than the output frequency of the AC driver, it is available to increase the vector control slip gain.

In FVC control mode, adjusting the slip gain of vector control can change the output current of the AC drive under the same load. For example, in large-capacity AC drives, if the load-carrying capacity is weak, it is available to gradually reduce this parameter. Generally, there is no need for adjustment.

Related Parameters

P2-06

7.4.6 Weak Magnetic Speed Regulation

During weak magnetic operation, when the motor speed exceeds the rated speed, the rated torque decreases due to the weakening of the magnetic field. To ensure constant torque operation, the motor's current increases proportionally with the speed, leading to overheating and inability to operate normally. The maximum voltage output coefficient indicates the AC driver's ability to enhance the maximum load capacity in the field weakening region of the motor. Adjusting the maximum voltage output coefficient (A5-05) can improve the maximum load capacity of the motor in the field weakening region, but it also increases the ripple current in the motor, which can increase the heating of the motor. Decreasing A5-05 reduces the ripple current and the heat generated by the motor, but also reduces the maximum load capacity of the motor. Generally, there is no need for adjustment.

Related Parameters

A5-05 and P2-21

7.5 Application Control

7.5.1 Jog Operation

In certain application scenarios, brief low-speed operation of the AC drive is required to test the condition of the equipment. At such times, jog operation is adopted. During jog operation, the start mode is fixed as direct start (P6-00=0), and the stop mode is fixed as deceleration stop (P6-10=0). The relationship between the output frequency and the acceleration and deceleration times during jog operation is illustrated in the figure below:

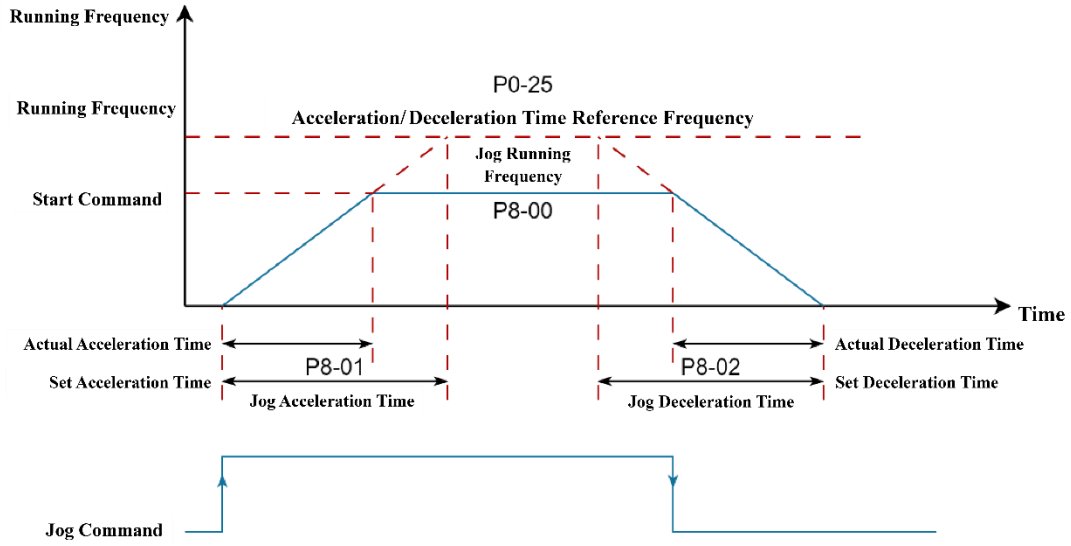


Figure 7-40. Jog Operation Diagram

Related Parameters

P0-02, P0-25, P7-01, P8-00 ~ P8-02, P8-13, and P8-27

Application Example

Step	Forward Jog	Reverse Jog
1	Set P7-01 (MF.K) to 3 (forward jog).	Set P7-01 (MF.K) to 4 (reverse jog). Set P8-13 (reverse frequency prohibition) to 0 to allow reverse running.
2	Set P0-02 (command source) to 0 (operation panel)	Set P0-02 (command source) to 0 (operation panel)
3	Set P8-00 (jog running frequency), P8-01 (jog acceleration time), and P8-02 (jog deceleration time).	Set P8-00 (jog running frequency), P8-01 (jog acceleration time), and P8-02 (jog deceleration time).
4	When the AC drive is in the stopped state, press and hold the MF.K button and the AC drive jogs forward; release the MF.K button and the AC drive decelerates to stop.	When the AC drive is in the stopped state, press and hold the MF.K button and the AC drive jogs in reverse; release the MF.K button and the AC drive decelerates to stop.

7.5.2 Frequency Detection

7.5.2.1 Frequency Detection (FDT)

This function is used to set the detection value of the output frequency and the hysteresis value for releasing the output action. The hysteresis value is effective only during deceleration, and hysteresis value is not detected during acceleration. The frequency detection function is illustrated in the figure below:

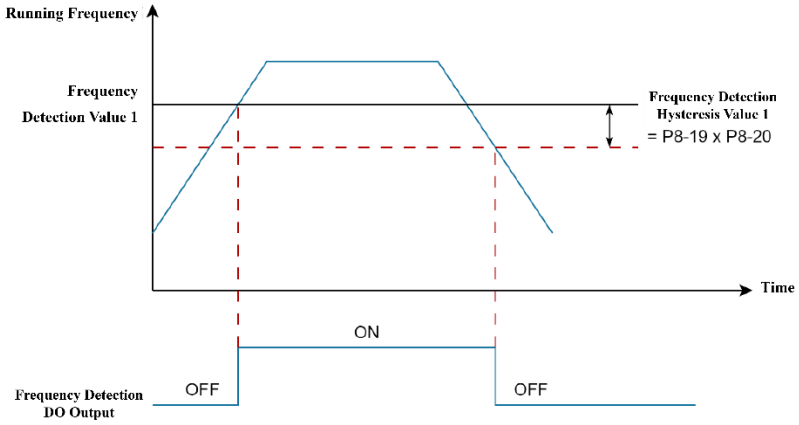


Figure 7-41. Frequency Detection Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-19	Frequency Detection Value 1	50.00Hz	During acceleration, when the output frequency reaches P8-19, the DO output becomes valid. During deceleration, when the output frequency drops below (P8-19 x (1.00 - P8-20)), the DO output becomes invalid.
P8-20	Frequency Detection Hysteresis Value 1	5.0%	

Parameter	Function Definition	Default	Description
P8-28	Frequency Detection Value 2	50.00Hz	During acceleration, when the output frequency reaches P8-19, the DO output becomes valid. During deceleration, when the output frequency drops below (P8-19 x (1.00 - P8-20)), the DO output becomes invalid.
P8-29	Frequency Detection Hysteresis Value 2	5.0%	

7.5.2.2 Hopping Frequency

By setting the hopping frequency, the AC drive can bypass the mechanical resonance point of the load. WD400 supports 2 hopping frequency points. If both hopping frequencies are set to 0, the hopping frequency function is deactivated.

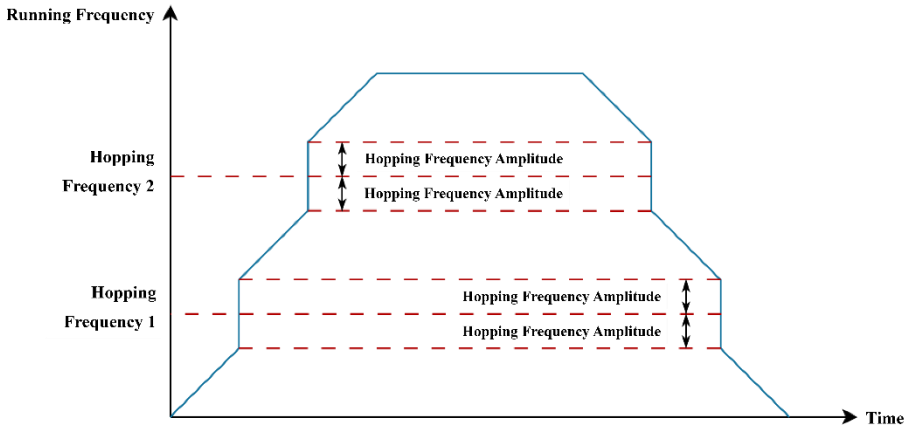


Figure 7-42. Hopping Frequency Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-09	Hopping Frequency 1	0.00Hz	By setting the hopping frequency, the AC drive can bypass the mechanical resonance point of the load. This parameter represents the first hopping frequency point; set to 0 to deactivate the first hopping frequency function.
P8-10	Hopping Frequency 2	0.00Hz	By setting the hopping frequency, the AC drive can bypass the mechanical resonance point of the load. This parameter represents the second hopping frequency point; set to 0 to deactivate the second hopping frequency function.
P8-11	Hopping Frequency Amplitude	0.00Hz	During acceleration, when the running frequency reaches the hopping frequency boundary, the AC drive skips the hopping frequency, with a hopping amplitude of twice P8-11; During deceleration, when the running frequency reaches the hopping frequency boundary, the AC drive skips the hopping frequency, with a hopping amplitude of twice P8-11.
P8-22	Hopping Frequency During Acceleration/Deceleration	0	0: Invalid 1: Valid When P8-22=1, during acceleration/deceleration, if the running frequency reaches the hopping frequency boundary, the AC drive skips this frequency

			segment; otherwise, it does not skip.

7.5.2.3 Reverse Frequency Prohibition

Reverse frequency prohibition is set via Parameter P8-13. The reverse frequency prohibition diagram is shown in the figure below:

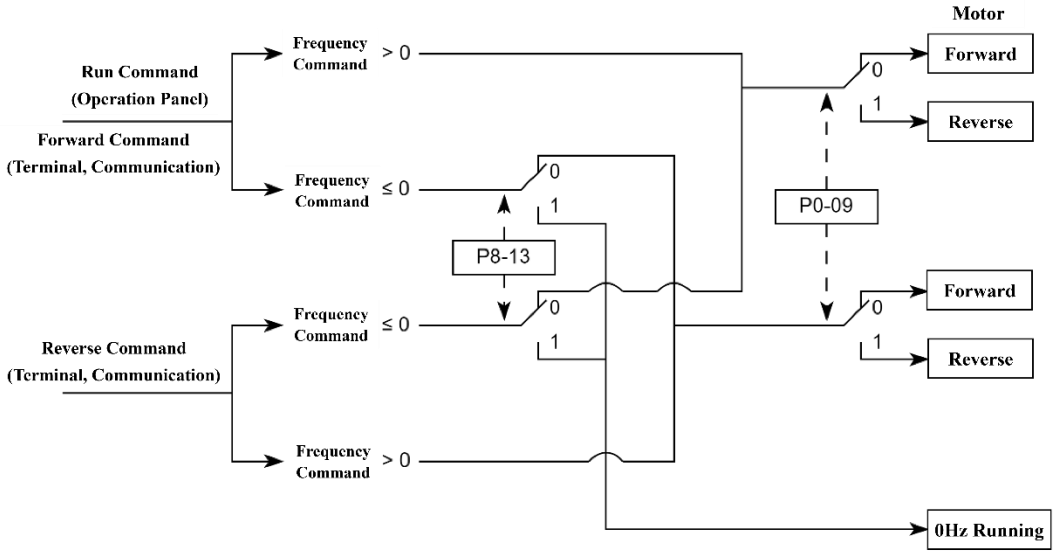


Figure 7-43. Reverse Frequency Prohibition Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-13	Reverse Frequency Prohibition	0	0: Reverse Allowed 1: Reverse Prohibited When P8-13=1, upon inputting a reverse command to the AC driver, the motor operates at a zero frequency.
P0-09	Running Direction Selection	0	0: Default Direction 1: Opposite of Default Direction Set this parameter to change the motor's running direction without altering its wiring, essentially by adjusting any two of the motor's lines (U, V, W).

7.5.2.4 Frequency Arrival Detection Amplitude

The frequency arrival detection amplitude is P8-21 x P0-10 (maximum frequency). When the AC driver's running frequency is within the setting range (set frequency ± detection amplitude), the DO terminal output is valid.

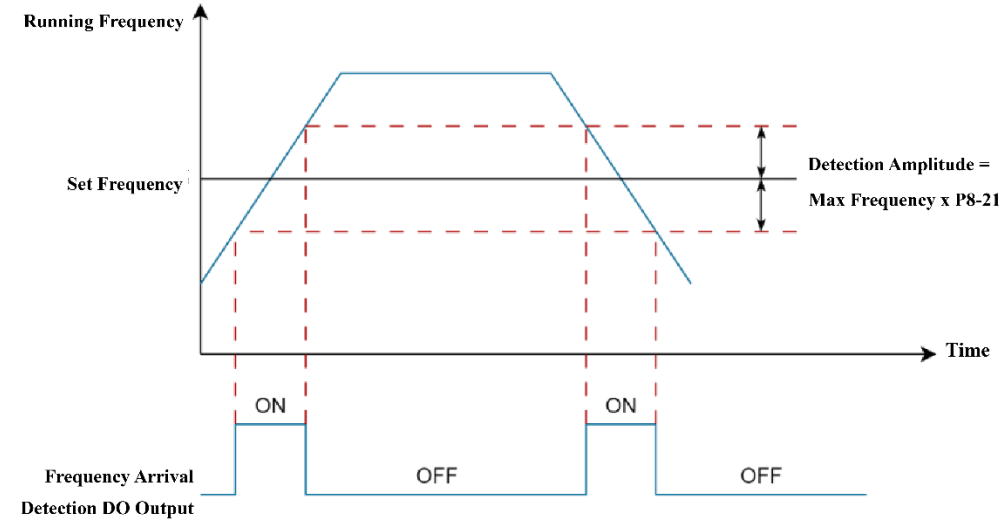


Figure 7-44. Sequence Diagram for Frequency Arrival Detection Amplitude

Related Parameters

Parameter	Function Definition	Default	Description
P8-21	Frequency Arrival Detection Amplitude	0.00%	0.00 ~ 100%

7.5.2.5 Acceleration/Deceleration Time Switch Frequency Point

This function is used to automatically select different acceleration/deceleration times based on the running frequency range during AC drive operation. If the DI terminal function is set to 16 (acceleration/deceleration time selection terminal 1) or 17 (acceleration/deceleration time selection terminal 2), this function is invalid. During acceleration, if the running frequency is less than P8-25, Acceleration Time 2 is selected; if the running frequency is greater than P8-25, acceleration time 1 is selected. During deceleration, if the running frequency is greater than P8-26, deceleration time 1 is selected; if the running frequency is less than P8-26, deceleration time 2 is selected.

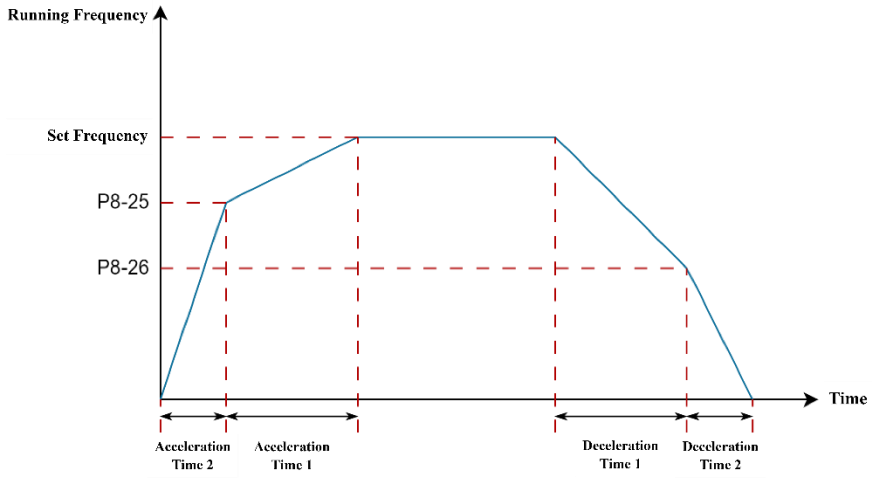


Figure 7-45 Acceleration/Deceleration Time Switching Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-25	Acceleration Time 1/Acceleration Time 2 Switch Frequency Point	0.00Hz	0.00 ~ P0-10 Hz
P8-26	Deceleration Time 1/Deceleration Time 2 Switch Frequency Point	0.00Hz	0.00 ~ P0-10 Hz

7.5.2.6 Arbitrary Frequency Arrival Detection Value

When the AC driver's running frequency is within the setting range, the DO terminal output is valid. The setting range is (frequency detection value ± frequency detection amplitude x maximum frequency).

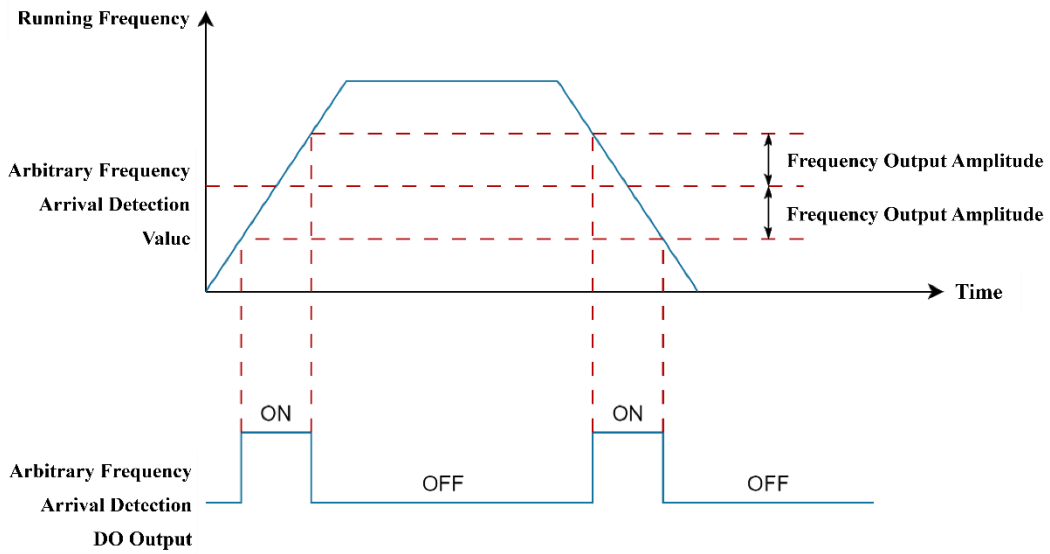


Figure 7-46 Arbitrary Frequency Arrival Detection Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-30	Frequency Arrival Detection Value 1	50.00Hz	0.00 ~ P0-10 Hz
P8-31	Frequency Arrival Detection Amplitude 1	0.0%	0.0 ~ 100.0%
P8-32	Frequency Arrival Detection Value 2	50.00Hz	0.00 ~ P0-10 Hz
P8-33	Frequency Arrival Detection Amplitude 2	0.0%	0.0 ~ 100.0%

7.5.3 Current Detection

7.5.3.1 Zero Current Detection

When the output current of the AC drive is lower than or equal to the zero current detection level (P8-34) and persists for longer than the zero current detection delay time (P8-35), the DO terminal output is valid.

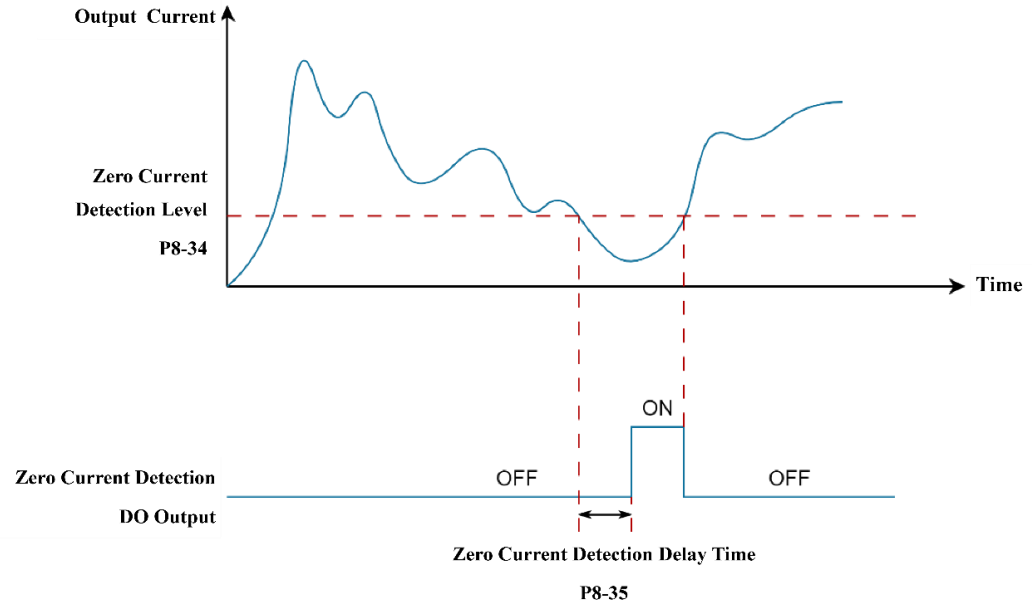


Figure 7-47. Zero Current Detection Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-34	Zero Current Detection Level	5.0%	0.0 ~ 300.0%
P8-35	Zero Current Detection Delay Time	0.10s	0.01 ~ 600.00s

7.5.3.2 Output Current Exceeded

When the output current of the AC drive exceeds the amplitude of output current exceeded (P8-36) and persists for longer than the detection delay time of output current exceeded (P8-37), the DO terminal output is valid.

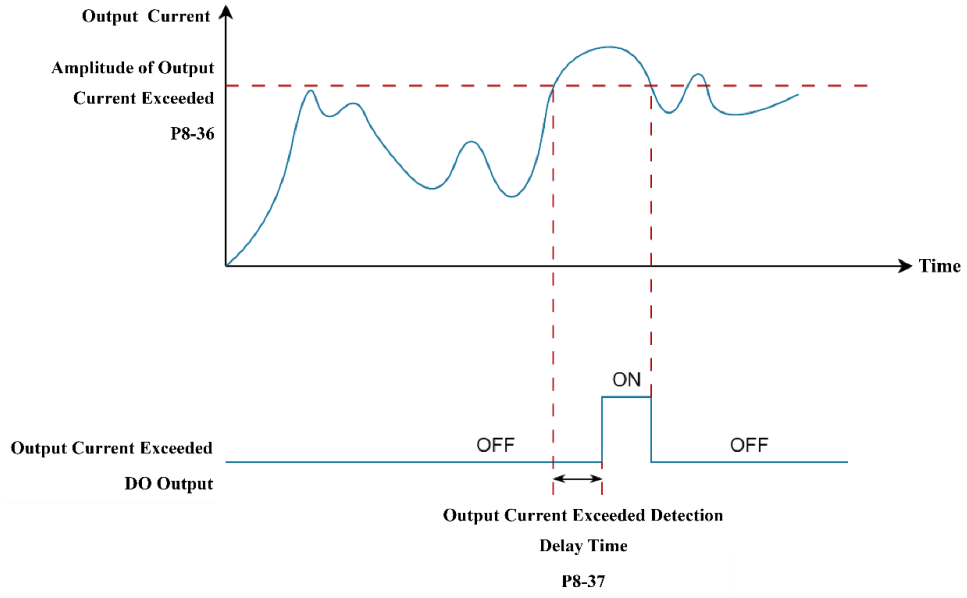


Figure 7-48. Sequence Diagram for Output Current Exceeded Detection

Related Parameters

Parameter	Function Definition	Default	Description
P8-36	Amplitude of Output Current Exceeded	200.0%	0.0 ~ 300.0%
P8-37	Detection Delay Time of Output Current Exceeded	0.00s	0.00 ~ 600.00s

7.5.3.3 Arbitrary Current Reached

When the output current of the AC drive is within the range ((arbitrary current reached ± width of arbitrary current reached) × motor rated current), the DO terminal output is valid.

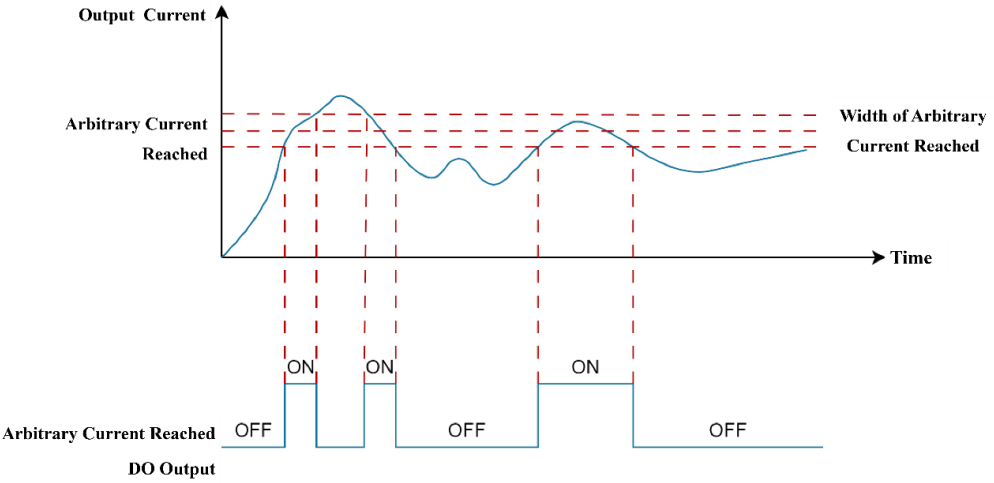


Figure 7-49. Sequence Diagram for Arbitrary Current Reached

Related Parameters

Parameter	Function Definition	Default	Description
P8-38	Arbitrary Current Reached 1	100.0%	0.0 ~ 300.0%
P8-39	Width of Arbitrary Current Reached 1	0.0%	0.0 ~ 300.0%
P8-40	Arbitrary Current Reached 2	100.0%	0.0 ~ 300.0%
P8-41	Width of Arbitrary Current Reached 2	0.0%	0.0 ~ 300.0%

7.5.4 Forward/Reverse Dead Time

Between forward and reverse running, the transition time when the output is at 0 Hz is known as the forward/reverse dead time.

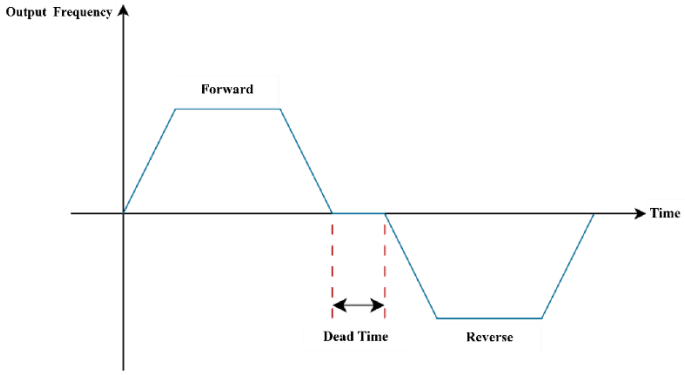


Figure 7-50 Forward/Reverse Dead Time Diagram

Related Parameters

Parameter	Function Definition	Default	Description
P8-12	Forward/Reverse Dead Time	0.0s	0.0 ~ 3000.0s

7.5.5 Timing Function

Each time the AC drive starts, it begins timing from zero. Upon reaching the timed running time (P8-44), the AC drive automatically stops, and the DO terminal output is valid. The remaining running time can be checked via U0-20.

If the cumulative power-on time (P7-08) exceeds the set power-on arrival time (P8-16), the AC drive will report Err38 fault, and the DO terminal output is valid.

If the cumulative running time (P7-09) exceeds the set running arrival time (P8-17), the AC drive will report Err37 fault, and the DO terminal output is valid.

Related Parameters

Parameter	Function Definition	Default	Description
P8-42	Timing Function Selection	0	0: Invalid 1: Valid
P8-43	Timed Running Time Selection	0	0: P8-44 (Timed Running Time) Setting 1: AI1 2: AI2 3: AI3 If set to 0, Timing = P8-44. If set to 1/2/3, Timing = (AI voltage ÷ 10V) × P8-44; 100% AI scale corresponds to P8-44.
P8-44	Timed Running Time	0.0m	0.0 ~ 6500.0m
P8-16	Set Power-on Arrival Time	0h	0 ~ 65000h
P8-17	Set Running Arrival Time	0h	0 ~ 65000h

7.5.6 Length Control Function

The length pulse for the length control function can only be collected via the DI5 terminal. The function selection of the DI5 terminal must be set to 27 (length count input).

Actual length (PB-06) = Terminal sampled pulse count ÷ Pulses per meter (PB-07). When the actual length (PB-06) exceeds the set length (PB-05), the DO terminal output is valid (Function 10: Length Reached). During length control, a length reset operation can be performed via the multi-functional DI terminal (DI Function 28).

In length control mode, direction is not recognized; length is calculated based solely on pulse count. An automatic shutdown system can be realized by reporting the DO output signal for "length reached" to the AC driver's shutdown input terminal.

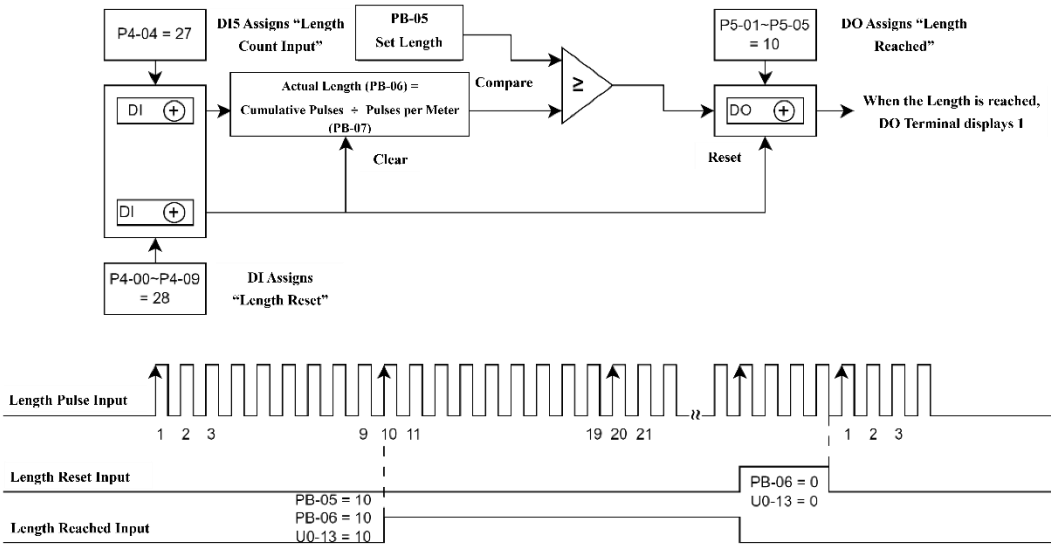


Figure 7-51. Length Control Function Diagram

Related Parameters

P4-00 ~ P4-09, P5-01 ~ P5-05, and PB-05 ~ PB-07

7.5.7 Counting Function

Count values need to be collected via the DI terminal (use the DI5 port for higher pulse frequencies), and the DI terminal function is set to 25 (counter input).

When the count value reaches the set count value (PB-08), the DO terminal output is valid (Function 8: Set Count Value Reached); when the count value reaches the specified count value (PB-09), the DO terminal output is valid (Function 9: Specified Count Value Reached). A counter reset operation can be performed via the multi-functional DI terminal (DI Function 26).

Count values can be retained even after powering off. An automatic shutdown system can be realized by reporting the DO output signal for "count value reached" to the AC driver's shutdown input terminal.

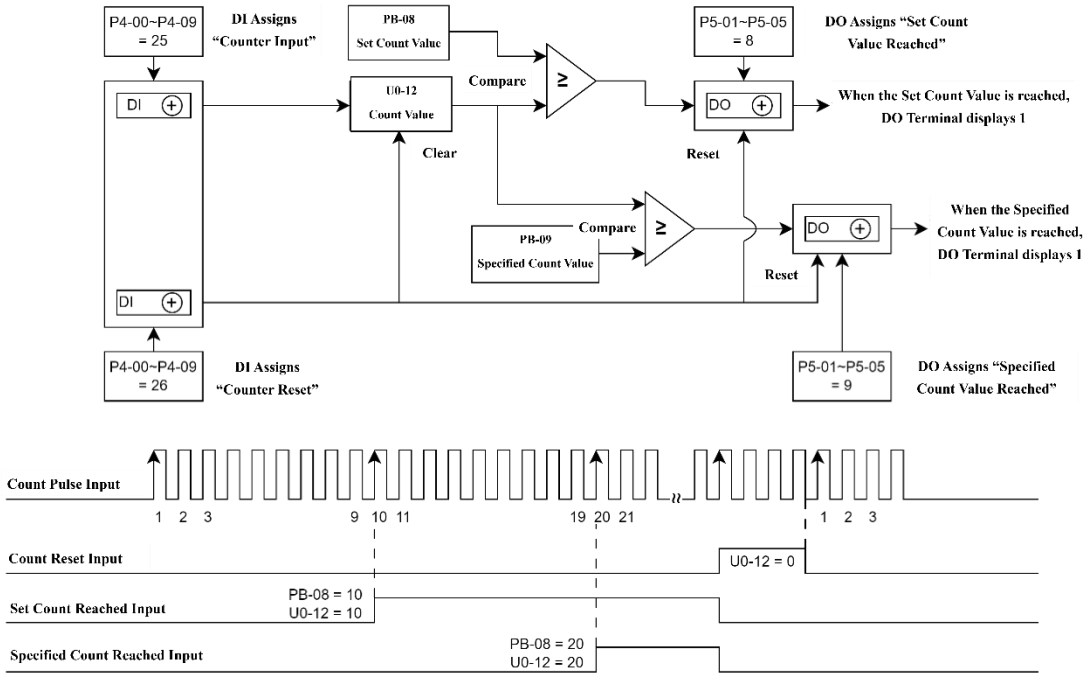


Figure 7-52. Counting Function Diagram

Related Parameters

P4-00 ~ P4-09, P5-01 ~ P5-05, and PB-08 ~ PB-09

7.6 Faults and Protection

7.6.1 Start Protection

Set P8-18 to 1 to provide startup safety protection for the AC drive to prevent the motor from responding to a run command unknowingly during power-on or fault reset. It can protect against the following two situations:

1. If the AC drive powers on with an active run command (for example, the terminal run command is closed before power-on), the AC drive will not respond to the run command until the run command is withdrawn once and then reactivated.
2. If the AC drive resets a fault with an active run command, the AC drive will not respond to the run command until the run command is withdrawn to eliminate the operation protection state.

Parameter	Function Definition	Default	Description
P8-18	Start Protection Selection	0	0: No Protection 1: Protection

7.6.2 Setting of Undervoltage Point, Overvoltage Point, and Rapid Current Limiting Protection

Parameter	Function Definition	Default	Description
A5-06	Undervoltage Point Setting	Model-Based	200.0 ~ 2000.0V During operation, if the bus voltage is lower than this set value, the AC drive will send an alarm (Err08).
A5-09	Overvoltage Point Setting	Model-Based	200.0 ~ 2000.0V If the bus voltage is equal to or higher than this set value, the AC drive will send an alarm (Err05 ~ 07).
A5-04	Rapid Current Limiting Enable	1	0: Disable 1: Enable It is recommended to turn off this feature in lifting applications.

7.6.3 Phase Loss Protection

Parameter	Function Definition	Default	Description
P9-12	Input Phase Loss/Contactor Pulling In Protection Selection	11	Ones: Input Phase Loss Protection 0: Disallow 1: Allow Tens: Contactor Pulling In Protection 0: Disallow 1: Allow
P9-13	Output Phase Loss Protection Selection	01	Ones: Output Phase Loss Protection (Running) 0: Disallow 1: Allow (Note: If set to 0 and an actual output phase loss occurs, no fault will be reported. At this time, the actual current

			is slightly higher than the displayed current on the panel, posing a risk; use cautiously.) Tens: Output Phase Loss Protection (Before Running) 0: Disallow 1: Allow (Note: Detection of output phase loss takes several seconds during operation. For applications where the AC drive is at risk starting after a phase loss or operates at low frequencies, enable this feature to quickly detect whether there is an output phase loss at startup. However, for applications with strict startup time requirements, it is recommended not to enable this feature.)

7.6.4 Motor Overheat Protection

Parameter	Function Definition	Default	Description
P9-56	Motor Temperature Sensor Type	0	0: No Sensor 1: PT100 2: PT1000 The motor temperature sensor signal comes from the IO expansion card. It supports PT100 and PT1000 sensors. If applying, correctly set the sensor type. The motor temperature value is displayed in U0-34.
P9-57	Motor Overheat Protection Threshold	110℃	0 ~ 200℃ When the motor temperature exceeds the motor overheat protection threshold, the AC drive will send an alarm (Err31) and handle it according to the selected fault protection action (P9-48).
P9-58	Motor Overheat Pre-Alarm Threshold	90℃	0 ~ 200℃ When the motor temperature exceeds the motor overheat pre-alarm threshold, the DO terminal output is valid (Function 39: Motor Overheat Output).

7.6.5 Motor Overload Protection

To provide effective protection for different load motors, the overload protection gain must be set according to the motor's overload capability. The motor overload protection follows an inverse-time characteristic curve, with the longest overload duration of 80 minutes and the shortest of 10 seconds.

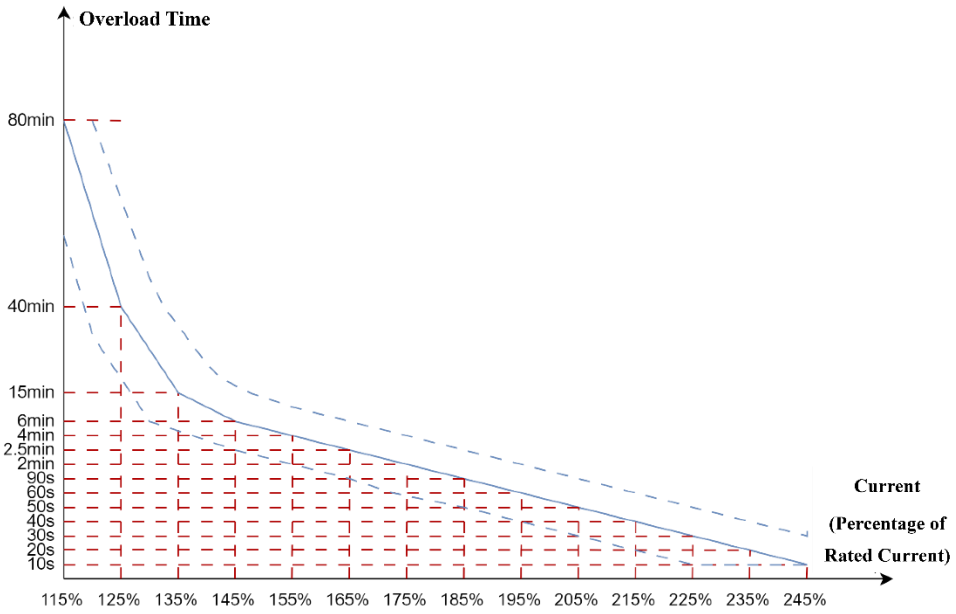


Figure 7-53. Inverse-Time Characteristic Curve of Motor Overload Protection

Overload Multiple	Protection Time	Overload Multiple	Protection Time
115%	80min	185%	90s
125%	40min	195%	60s
135%	15min	205%	50s
145%	6min	215%	40s
155%	4min	225%	30s
165%	2.5min	235%	20s
175%	2min	245%	10s

Example 1:

Assuming the motor has a rated current of 100A, if P9-01 is set to 1.00, according to the diagram above, when the motor's running current reaches 125% (125A) of the rated current, the AC drive will report a motor overload fault after 40 minutes. If P9-01 is set to 1.20, then according to the diagram above, when the motor's running current reaches 125% (125A) of the rated current, the AC drive will report a motor overload fault (Err30) after 40 × 1.2 = 48 minutes.

Example 2:

The motor will report a motor overload fault after operating at 150% of the rated current for 2 minutes (Tt). According to the motor overload characteristic curve, the 150% (I) current is within the interval between 145% (I1) and 155% (I2), where the 145% current trips after 6 minutes (T1),

and the 155% current trips after 4 minutes (T2). Thus, the 150% rated current trips after 5 minutes (T) under the default setting. The equation is as follows:

$$T = T2 + \frac{(T1 - T2) * (I - I1)}{(I2 - I1)}$$

T = 4 + (6 - 4) × (150% – 145%) ÷ (155% – 145%) = 5 (minutes)

P9-01 Motor Overload Protection Gain (C) = 2 ÷ 5 = 0.4。The equation is as follows:

$$C = \frac{Tt}{T}$$

ATTENTION

Users should correctly set the value of P9-01 based on the actual overload capability of the motor. Setting this parameter too high could lead to motor overheat damage before the AC drive sends a timely protection alarm.

Motor overload pre-alarm coefficient (P9-02): When the motor overload detection level reaches the set value of this parameter, the multi-functional output terminal DO or fault relay (RELAY) outputs a motor overload pre-alarm signal. This parameter is calculated based on the percentage of time the motor can run at a certain overload level without triggering an overload fault.

For example: When the motor overload protection gain is set to 1.00 and the motor overload pre-alarm coefficient is set to 80%, if the motor current reaches 145% of the rated current and runs for 4.8 minutes (80% × 6 minutes), the multi-functional output terminal DO or fault relay (RELAY) outputs a motor overload pre-alarm signal.

The motor overload pre-alarm function provides a pre-alarm signal to the control system before the motor overload fault protection activates. This pre-alarm coefficient determines the margin before the overload protection triggers. A higher value means a smaller lead time. When the cumulative output current of the AC drive exceeds the product of the overload time (the Y-value of the motor overload protection inverse-time characteristic curve) and the motor overload pre-alarm coefficient, the multi-functional digital DO terminal outputs an effective motor overload pre-alarm signal. In special cases, when the motor overload pre-alarm coefficient is set to 100%, the lead time is zero, and the pre-alarm and overload protection occur simultaneously.

Parameter	Function Definition	Default	Description
P9-00	Motor Overload Protection Selection	1	0: Disallow 1: Allow If set to 0 to disable the protection function, it is suggested to use a thermal relay in front of the motor.
P9-01	Motor Overload Protection Gain	1.00	0.20 ~ 10.00 If adjustment of the motor overload current and time is needed, set this parameter.
P9-02	Motor Overload Pre-Alarm Coefficient	80%	50% ~ 100% This coefficient is used to determine the

			margin before the motor overload protection triggers. A higher value means a smaller lead time.

7.6.6 Load Shedding Protection

Parameter	Function Definition	Default	Description
P9-63	Load Shedding Protection Selection	0	0: Invalid 1: Valid If the load shedding protection function is enabled, when the output current of the AC drive is lower than P9-64 (load shedding detection level) and persists for longer than P9-65 (load shedding detection time), the AC drive executes the load shedding protection action (load shedding action can be selected via P9-49; default to free stop). During the load shedding protection period, if the load recovers, the AC drive will automatically resume operation at the set frequency.
P9-64	Load Shedding Detection Level	10.00%	0.0 ~ 100.0%
P9-65	Load Shedding Detection Time	1.0s	0.0 ~ 60.0s

7.6.7 Overspeed Protection

Parameter	Function Definition	Default	Description
P9-67	Overspeed Detection Value	20.00%	0.0 ~ 50.0% When the actual speed of the motor exceeds the maximum frequency (P0-10) by a value greater than P9-67 (overspeed detection value) and persists for longer than P9-68 (overspeed detection time), the AC drive reports Err47 and handles it according to the selected fault protection action (P9-50).
Parameter	Function Definition	Default	Description
P9-68	Overspeed Detection Time	1.0s	0.0 ~ 60.0s If P9-68 is set to 0.0s, the overspeed fault detection is disabled.

7.6.8 Excessive Speed Deviation Protection

Parameter	Function Definition	Default	Description
P9-69	Excessive Speed Deviation Detection Value	20.00%	0.0 ~ 50.0% When a deviation between the actual speed of the motor and the set frequency is detected, and the deviation exceeds P9-69 (excessive speed deviation detection value) and persists for longer than P9-70 (excessive speed deviation detection time), the AC drive reports Err42 and handles it according to the selected fault protection action (P9-50).
P9-70	Excessive Speed Deviation Detection Time	5.0s	0.0 ~ 60.0s If P9-70 is set to 0.0s, the excessive speed deviation detection is disabled.

7.6.9 Continuous Running Through Instantaneous Power Failure (Ride-Through)

The ride-through function allows the system to continue running during short power interruptions. When a power outage occurs, the AC drive puts the motor into the power generation state, maintaining the bus voltage around the “ride-through action adjustment voltage” to prevent the AC drive from shutting down due to undervoltage, as shown in the figure below:

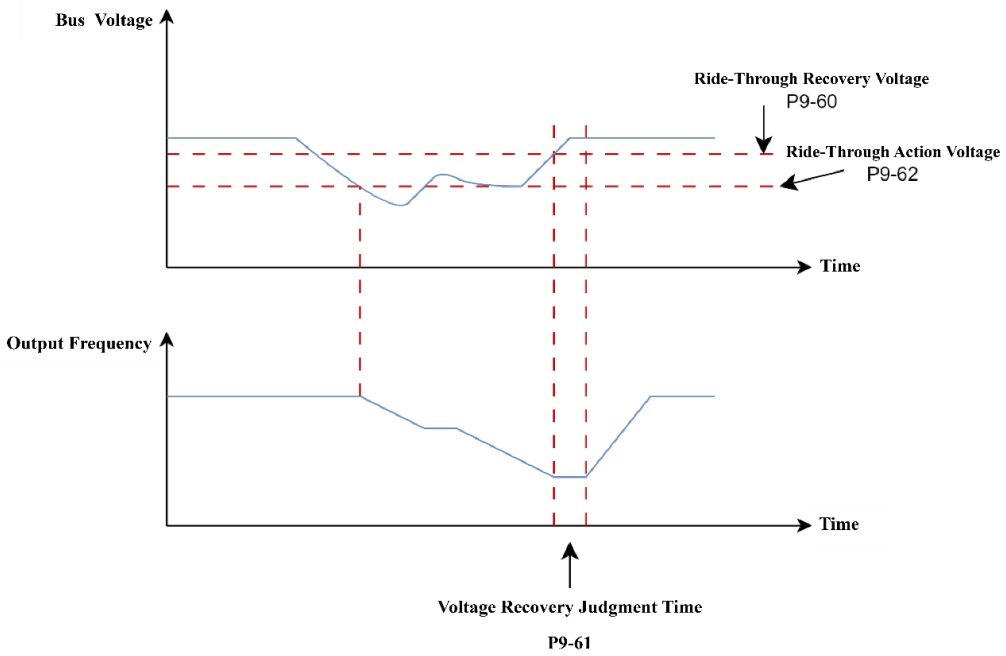


Figure 7-54. Ride-Through Process Diagram

Parameter	Function Definition	Default	Description
P9-59	Ride-Through Function Selection	0	0: Invalid 1: Constant Bus Voltage Control 2: Deceleration Stop 3: Voltage Dip Suppression The AC drive continues running during short power interruptions. When a power outage occurs, the AC drive puts the motor into the power generation state, maintaining the bus voltage around the “ride-through action voltage” to prevent the AC drive from shutting down due to undervoltage. 0: Invalid (ride-through function not used); 1: Constant Bus Voltage Control When a power outage occurs, the bus voltage is maintained around the “ride-through action voltage”. When power is restored, the output frequency of the AC drive returns to the target frequency at the acceleration time; 2: Deceleration Stop When a power outage occurs, the AC drive enters the deceleration stop state. When power is restored, the AC drive continues decelerating to 0Hz and remains shutdown until another run command is given; 3: Voltage Dip Suppression Used to solve the problem of the AC drive shutting down due to undervoltage caused by grid voltage dips. The voltage dip suppression time can be set via P9-77.
P9-60	Ride-Through Recovery Voltage	85%	80 ~ 100% This value is slightly lower than the bus voltage before the power outage. When a power outage occurs, the bus voltage is maintained around P9-62. Once power is restored, the bus voltage rises from P9-62 to P9-60. During this period, the output frequency of the AC drive decreases continuously until the bus voltage reaches P9-60.
P9-61	Ride-Through Voltage	0.5s	0.0 ~ 100.0s

	Recovery Judgment Time		Time for the bus voltage to rise from P9-60 to the required voltage before the power outage.
P9-62	Ride-Through Action Voltage	80%	60 ~ 100% Bus voltage level maintained during power outage. When a power outage occurs, the bus voltage is maintained around P9-62.
P9-71	Ride-Through Gain (Kp)	40	0 ~ 100 Valid only for the "Constant Bus Voltage Control" mode. If the ride-through process easily causes undervoltage, increase the ride-through gain and integral coefficient.
P9-72	Ride-Through Integral Coefficient (Ki)	30	
P9-73	Ride-Through Action Deceleration Time	20.0s	0.0 ~ 300.0s Valid only for the "Deceleration Stop" mode. When the bus voltage falls below P9-62, the AC drive executes deceleration stop, with the deceleration time determined by this parameter rather than P0-18.

7.6.10 Fault Reset

An undervoltage fault (Err08) automatically resets when the bus voltage returns to normal and is not included in the automatic reset count. A ground short circuit fault (Err32) cannot be automatically or manually reset and can only be reset by completely powering down the AC drive and then restarting it. The fault protection action will be executed after the automatic reset count is reached.

Parameter	Function Definition	Default	Description
P9-09	Count of Automatic Fault Resets	0	0 ~ 30 The count of automatic resets allowed for the AC driver. After this count is exceeded, the AC drive remains in the fault state. Special note: An undervoltage fault (Err08) automatically resets when the bus voltage returns to normal and is not included in the automatic reset count.
P9-10	DO Action Selection During Automatic Fault Reset	1	0: No Action 1: Action Whether the digital output terminal's fault output function is valid during the AC driver's automatic reset period. The digital output terminal's fault output

			function is defined by P5-04=2.
P9-11	Interval Time for Automatic Fault Reset	6.0s	0.1 ~ 100.0s Time from the AC driver's fault alarm to automatic reset.

7.6.11 Fault Protection Action Selection

Parameter	Function Definition	Default	Description
P9-47	Fault Protection Action Selection 1	00000	Ones: Motor Overload (Err30) 0: Free Stop 1: Default Stop Mode 2: Continue Running Tens: Input Phase Loss (Err12) Similar to "Ones" Hundreds: Output Phase Loss (Err13) Similar to "Ones" Thousands: External Fault (Err34) Similar to "Ones" Ten Thousands: Communication Fault (Err40) Similar to "Ones"
P9-48	Fault Protection Action Selection 2	00000	Ones: Encoder Fault (Err20) 0: Free Stop Tens: Parameter Read/Write Abnormality (Err19) 0: Free Stop 1: Default Stop Mode Hundreds: AC Drive Overload (Err09) 0: Free Stop 1: Derated Run Thousands: Motor Overheat (Err31) 0: Free Stop 1: Default Stop Mode 2: Continue Running Ten Thousands: Running Time Reached (Err37)

			Similar to “Thousands” The hundreds place is used to select the fault action when the AC drive is overloaded. When the parameter is set to 0, the AC drive reports an overload fault and locks out the output; when set to 1, the AC drive automatically reduces the output current near the rated current to avoid overload faults, but this may result in reduced speed or stalling. For lifting loads, set this parameter to 0.

Parameter	Function Definition	Default	Description
P9-49	Fault Protection Action Selection 3	00000	Ones: User-Defined Fault 1 (Err43) 0: Free Stop 1: Default Stop Mode 2: Continue Running Tens: User-defined Fault 2 (Err44) Similar to “Ones” Hundreds: Power-On Time Reached (Err38) Similar to “Ones” Thousands: Load Shedding (Err39) 0: Free Stop 1: Default Stop Mode 2: Continue running at 7% of the motor rated frequency; if no load shedding, returns to run at the set frequency. Ten Thousands: PID Feedback Lost During Operation (Err41) Similar to “Ones”
P9-50	Fault Protection Action Selection 4	00000	Ones: Excessive Speed Deviation (Err42) 0: Free Stop 1: Default Stop Mode 2: Continue Running Tens: Motor Overspeed (Err47) Similar to “Ones”

			Hundreds: Initial Position Error (Err48) Similar to “Ones” Thousands: Reserved Ten Thousands: Reserved
P9-54	Frequency Selection If Continue Running	0	0: Current Frequency 1: Set Frequency 2: Upper Limit Frequency 3: Lower Limit Frequency 4: Alternate Frequency for Abnormalities When a fault occurs during operation and the process mode for this fault has set to “Continue Running”, the AC drive displays “A**” and runs at the frequency set by P9-54.
P9-55	Alternate Frequency for Abnormalities	100%	0.0 ~ 100.0% (100.0% corresponds to the maximus frequency)

7.7 Monitoring

The monitoring function refers to displaying the status of the AC drive on the LED screen. There are 2 methods to view monitoring parameters:

1. In the stopped or running state, use the left and right buttons on the operation panel to switch the monitoring parameters associated with Display Parameters P7-03, P7-04, and P7-05.

In the running state, there are 32 running state parameters under Parameters P7-03 (Running Display Parameter 1) and P7-04 (Running Display Parameter 2). Users can change the binary bit to choose the corresponding parameter for display. In the stopped state, there are 13 stopped state parameters under Parameter P7-05 (Stop Display Parameter). Users can change the binary bit to choose the corresponding parameter for display. Refer to “P7 - Keypad and Display” under “Complete Parameter Tables”.

When the AC drive powers back on after a power-off, the parameter displayed is the parameter selected before the power-off by default. Not all monitoring parameters under P7-03, P7-04, and P7-05 correspond directly to the monitoring parameter in the U0 group. If the desired monitoring parameter is not found in P7-03, P7-04, and P7-05, try again with Method 2.

2. Use the operation panel to directly enter the U0 parameter group to view monitoring parameters. Refer to “U0 - Monitoring Parameters” under “Complete Parameter Tables”.

7.8 User Settings

7.8.1 User Password

Password Setting

Setting PP-00 establishes the user password. After setting the user password, the password is required to modify or view other parameter settings. Each time exiting the operation and re-entering requires password verification.

1. Password verification is mandatory in function parameter mode.
2. Password verification is mandatory in communication mode. Write the correct user password to address 1F00H for password verification; returning the actual password value indicates successful verification.

Password Cancellation

Setting PP-00 to 0 cancels the user password.

7.8.2 Parameter Initialization

Setting PP-01 to 01 restores most of the parameters to their factory default settings.

The following parameters cannot be restored to factory defaults:

- First Motor Parameters
- Second Motor Parameters
- Fault Record Information
- Cumulative Power-On Time (P7-08)
- Cumulative Running Time (P7-09)
- Cumulative Power Consumption (P7-10)
- PF - Factory Parameters
- AC - AIAO Correction

Setting PP-01 to 02 can clear fault record information, cumulative power-on time (P7-08), cumulative running time (P7-09), and cumulative power consumption (P7-10).

7.8.3 Sleep and Wake-Up

The sleep function, also known as the hibernation function, sets a sleep period within any time frame during a 24-hour cycle. Within this sleep period, the AC drive stops running and goes into sleep mode.

The sleep and wake-up function refers to the AC drive starting to run again and ending sleep mode during the sleep period.

Sleep and wakeup require setting wake-up frequency, sleep frequency, sleep time, etc. Normally, please set the wake-up frequency (P8-49) to be equal to or greater than the sleep frequency (P8-51). If both the wakeup frequency and the sleep frequency are set to 0.00Hz, the sleep and wakeup functions become invalid.

In the case of PID is computing and the sleep function is enabled, set PA-28 (PID Shutdown Operation) to 1 (Calculation During Stop) if PID should continue calculation; set PA-28 (PID Shutdown Operation) to 0 (No Calculation During Stop) if PID should stop calculation.

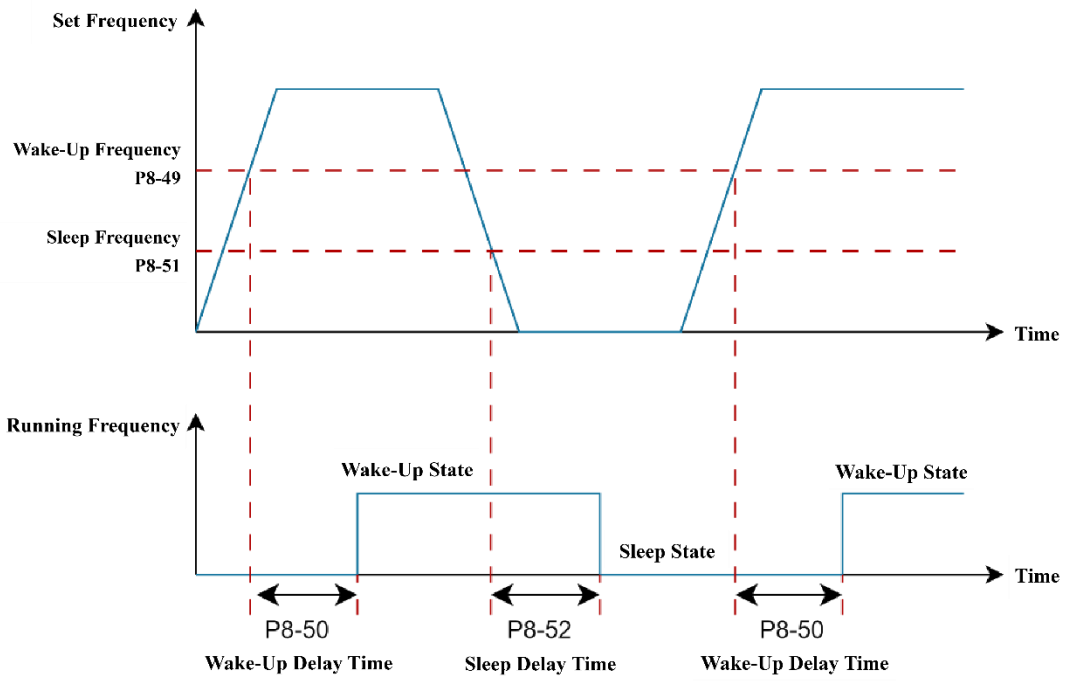


Figure 7-55. Sleep and Wake-Up Function Configuration

Parameter	Function Definition	Default	Description
P8-49	Wake-Up Frequency	0.00Hz	P8-51 ~ P0-10 Hz If the AC drive is in sleep mode and the current run command is valid, when the set frequency is equal to or higher than the wake-up frequency and the wakeup delay time has elapsed, the AC drive starts directly.
P8-50	Wake-Up Delay Time	0.0s	0.0 ~ 6500.0s
P8-51	Sleep Frequency	0.00Hz	0.00 ~ P8-49 Hz During AC drive operation, when the set frequency is equal to or lower than the wake-up frequency and the wakeup delay time has elapsed, the AC drive goes into sleep mode and decelerate to shop.
P8-52	Sleep Delay Time	0.0s	0.0 ~ 6500.0s

8. Complete Parameter Tables

P0 - Basic Function Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P0-00 F000H	Load Characteristic 1: Heavy Load 2: Light Load	1～2	1	Read-Only
P0-01 F001H	Motor Control Mode 1 0:SVC Control (Sensorless Vector Control) 1: FVC Control (Vector Control with Speed Sensor) 2: V/F Control (Open-Loop Speed Control)	0 ~ 2	0	Shutdown Change
P0-02 F002H	Command Source Selection 0: Operation Panel Command Channel 1: Terminal Command Channel 2: Communication Command Channel	0 ~ 2	0	Real-Time Change
P0-03 F003H	Primary Frequency Source X Selection 0: Digital Setting (Power-Off Memory unavailable) 1: Digital Setting (Power-Off Memory available) 2: AI1 3: AI2 4: AI3 5: PULSE Setting (DI5) 6: Multi-Segment Command 7: Simple PLC 8: PID 9: Communication Reference	0 ~ 9	0	Shutdown Change
P0-04 F004H	Auxiliary Frequency Source Y Selection 0: Digital Setting (Power-Off Memory unavailable) 1: Digital Setting (Power-Off Memory available) 2: AI1 3: AI2 4: AI3 5: PULSE Setting (DI5) 6: Multi-Segment Command	0 ~ 9	0	Shutdown Change

	7: Simple PLC 8: PID 9: Communication Reference			
P0-05 F005H	Auxiliary Frequency Source Y Range Selection (Overlay)	0 ~ 1	0	Real-Time Change
	0: Relative to Maximum Frequency 1: Relative to Frequency Source X			
P0-06 F006H	Auxiliary Frequency Source Y Range (Overlay)	0 ~ 150%	100%	Real-Time Change
P0-07 F007H	Frequency Source Overlay Selection	0 ~ 34	0	Real-Time Change
	Ones: Frequency Command Selection 0: Primary Frequency Source X 1: Primary-Auxiliary Operation Result (operation relation determined by tens) 2: Switch between Primary Frequency Source X and Auxiliary Frequency Source Y 3: Switch between Primary Frequency Source X and Primary-Auxiliary Operation Result 4: Switch between Auxiliary Frequency Source Y and Primary-Auxiliary Operation Result Tens: Primary-Auxiliary Operation Relation of Frequency Command 0: Primary Frequency Plus Auxiliary Frequency 1: Primary Frequency Minus Auxiliary Frequency 2: Take the Maximum 3: Take the Minimum			
P0-08 F008H	Preset Frequency	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
P0-09 F009H	Running Direction Selection	0 ~ 1	0	Real-Time Change
	0: Default Direction 1: Opposite of Default Direction			
P0-10 F00AH	Maximum Frequency	50.00 ~ 500.00Hz	50.00Hz	Shutdown Change
P0-11 F00BH	Upper Limit Frequency Source	0 ~ 5	0	Shutdown Change

	0: P0-12 Setting 1: AI1 2: AI2 3: AI3 4: PULSE Setting (DI5) 5: Communication Reference			
P0-12 F00CH	Upper Limit Frequency	P0-14 ~ P0-10Hz	50.00Hz	Real-Time Change
P0-13 F00DH	Upper Limit Frequency Offset	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P0-14 F00EH	Lower Limit Frequency	0.00 ~ P0-12Hz	0.00Hz	Real-Time Change
P0-15 F00FH	Carrier Frequency	0.5 ~ 16.0kHz	Model Determination	Real-Time Change
P0-16 F010H	Carrier Frequency Adjustment with Temperature 0: NO 1: YES	0 ~ 1	1	Real-Time Change
P0-17 F011H	Acceleration Time 1	0.0 ~ 6500.0s	20.0s	Real-Time Change
P0-18 F012H	Deceleration Time 1	0.0 ~ 6500.0s	20.0s	Real-Time Change
P0-19 F013H	Acceleration/Deceleration Time Unit 0: 1 Second 1: 0.1 Second 2: 0.01 Second	0 ~ 2	1	Shutdown Change
P0-21 F015H	Auxiliary Frequency Source Offset (Overlay)	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P0-22 F016H	Frequency Command Decimal Places	1 ~ 2	2	Unchangeable

	1: 0.1Hz 2: 0.01Hz			
P0-23 F017H	Digital Set Frequency Stop Memory Selection 0: No Memory 1: Memory	0 ~ 1	0	Real-Time Change
P0-24 F018H	Motor Parameter Group Selection 0: Motor Parameter Group1 1: Motor Parameter Group2	0 ~ 1	0	Shutdown Change
P0-25 F019H	Acceleration/Deceleration Time Reference Frequency 0: Maximum Frequency (P0-10) 1: Set Frequency 2: 100Hz	0 ~ 2	0	Shutdown Change
P0-26 F01AH	UP/DOWN Reference Frequency (Running) 0: Running Frequency 1: Set Frequency	0 ~ 1	0	Shutdown Change
P0-27 F01BH	Command Source Binding to Frequency Source Ones: Operation Panel Command Binding to Frequency Source Selection 0: No Binding 1: Digital Setting Frequency 2: AI1 3: AI2 4: AI3 5: PULSE Setting (DI5) 6: Multi-Segment Speed 7: Simple PLC 8: PID 9: Communication Reference Tens: Terminal Command Binding to Frequency Source Selection Hundreds: Communication Command Binding to Frequency Source Selection	0 ~ 9999	0	Real-Time Change
P0-28 F01CH	Communication Protocol Selection 0: Modbus Protocol 1: Profibus-DP Protocol, CANopen Protocol	0 ~ 1	0	Shutdown Change

P1 - First Motor Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P1-00 F100H	Motor Type Selection	0～2	0	Shutdown Change
	0: Standard Asynchronous Motor 1: Variable Frequency Asynchronous Motor 2: Permanent Magnet Synchronous Motor 3: Reluctance Synchronous Motor			
P1-01 F101H	Motor Rated Power	0.1 ~ 1000.0kW	Model Determination	Shutdown Change
P1-02 F102H	Motor Rated Voltage	1 ~ 2000V	Model Determination	Shutdown Change
P1-03 F103H	Motor Rated Current	0.01 ~ 655.35A	Model Determination	Shutdown Change
P1-04 F104H	Motor Rated Frequency	0.01 ~ P0-10Hz	Model Determination	Shutdown Change
P1-05 F105H	Motor Rated Speed	1 ~ 65535rpm	Model Determination	Shutdown Change
P1-06 F106H	Asynchronous Motor Stator Resistance	0.001 ~ 65.535Ω	Model Determination	Shutdown Change
P1-07 F107H	Asynchronous Motor Rotor Resistance	0.001 ~ 65.535Ω	Model Determination	Shutdown Change
P1-08	Asynchronous Motor	0.01 ~	Model	Shutdown

F108H	Leakage Reactance	655.35mH	Determination	Change
P1-09 F109H	Asynchronous Motor Mutual Reactance	0.01 ~ 655.35mH	Model Determination	Shutdown Change
P1-10 F10AH	Asynchronous Motor No-load Current	0.1 ~ P1-03 A	Model Determination	Shutdown Change
P1-16 F110H	Synchronous Motor Stator Resistance	0.001 ~ 65.535Ω	Model Determination	Shutdown Change
P1-17 F111H	Synchronous Motor D-Axis Inductance	0.01 ~ 655.35mH	Model Determination	Shutdown Change
P1-18 F112H	Synchronous Motor Q-Axis Inductance	0.01 ~ 655.35mH	Model Determination	Shutdown Change
P1-20 F114H	Synchronous Motor Back EMF	0.0 ~ 6553.5V	Model Determination	Shutdown Change
P1-27 F11BH	Encoder Lines	1 ~ 65535	Model Determination	Shutdown Change
P1-28 F11CH	Encoder Type	0 ~ 4	Model Determination	Shutdown Change
	0: ABZ Incremental Encoder 1: ABZ Differential Encoder with UVW Signals 2: Resolver Encoder 3: ABZ Differential Encoder with Sine/Cosine Signals 4: UVW Encoder with Cable Saving Mode			
P1-29 F11DH	Speed Feedback PG Selection	0 ~ 1	Model Determination	Shutdown Change

	0: Primary PG Card 1: Auxiliary PG Card			
P1-30 F11EH	Encoder AB Phase Sequence 0: Forward 1: Reverse	0 ~ 1	Model Determination	Shutdown Change
P1-31 F11FH	Encoder Installation Angle	0.0 ~ 359.9°	Model Determination	Shutdown Change
P1-32 F120H	UVW Signal Direction	0 ~ 65535	Model Determination	Shutdown Change
P1-33 F121H	UVW Signal Zero Position Angle	0.0 ~ 6553.5	Model Determination	Shutdown Change
P1-34 F122H	Resolver Pole Pairs	1 ~ 65535	Model Determination	Shutdown Change
P1-36 F124H	Speed Feedback PG Break Detection Time	0.0 ~ 10.0s	Model Determination	Shutdown Change
P1-37 F125H	Tuning Selection 0: No Action 1: Asynchronous Motor Static Partial Tuning 2: Asynchronous Motor Dynamic Tuning 3: Asynchronous Motor Static Complete Tuning 11: Synchronous On-Load Tuning 12: Synchronous No-Load Tuning	0 ~ 12	0	Shutdown Change

P2 - First Motor Vector Control Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P2-00 F200H	Speed Loop Proportional Gain 1	1 ~ 100	30	Real-Time Change
P2-01 F201H	Speed Loop Integral Time 1	0.01 ~ 10.00s	0.50s	Real-Time Change
P2-02 F202H	Switching Frequency 1	0.00 ~ P2-05Hz	5.00Hz	Real-Time Change
P2-03 F203H	Speed Loop Proportional Gain 2	1 ~ 100	20	Real-Time Change
P2-04 F204H	Speed Loop Integral Time 2	0.01 ~ 10.00s	1.00s	Real-Time Change
P2-05 F205H	Switching Frequency 2	P2-02 ~ P0-10Hz	10.00Hz	Real-Time Change
P2-06 F206H	Vector Control Slip Gain	50 ~ 200%	100%	Real-Time Change
P2-07 F207H	SVC Speed Feedback Filter Time	0.000 ~ 0.100s	0.015s	Real-Time Change
P2-08 F208H	Vector Control Over-Excitation Gain	0 ~ 200	64	Real-Time Change
P2-09 F209H	Speed Control (Drive) Torque Upper Limit Source 0: Upper Limit Digital Setting (P2-10) 1: AI1 2: AI2 3: AI3 4: PULSE Setting (DI5) 5: Communication Reference 6: MIN (AI1, AI2) 7: MAX (AI1, AI2)	0 ~ 7	0	Real-Time Change

P2-10 F20AH	Speed Control (Drive) Torque Upper Limit Digital Setting	0.0 ~ 200.0%	150.0%	Real-Time Change
P2-11 F20BH	Speed Control (Brake) Torque Upper Limit Source 0: Upper Limit Digital Setting (P2-10) 1: AI1 2: AI2 3: AI3 4: PULSE Setting (DI5) 5: Communication Reference 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 8: Upper Limit Digital Setting (P2-12)	0 ~ 8	0	Real-Time Change
P2-12 F20CH	Speed Control (Brake) Torque Upper Limit Digital Setting	0.0 ~ 200.0%	150.0%	Real-Time Change
P2-13 F20DH	Excitation Regulation Proportional Gain	0 ~ 60000	2000	Real-Time Change
P2-14 F20EH	Excitation Regulation Integral Gain	0 ~ 60000	1300	Real-Time Change
P2-15 F20FH	Torque Regulation Proportional Gain	0 ~ 60000	2000	Real-Time Change
P2-16 F210H	Torque Regulation Integral Gain	0 ~ 60000	1300	Real-Time Change
P2-18 F212H	Synchronous Motor Weak Magnetic Mode	0~1	1	Stop Change
P2-19 F213H	Synchronous Motor Weak Magnetic Coefficient	1~50	5	Real-Time Change
P2-20 F214H	Maximum Weak Magnetic Current	1~300	50	Stop Change

P2-21 F215H	Weak Magnetic Field Maximum Torque Coefficient	10~500	100	Real-Time Change

P2-22 F216H	Power Generation Limit Enable 0: Invalid 1: Valid	0 ~ 1	0	Real-Time Change
P2-23 F217H	Power Generation Upper Limit	0.0 ~ 200.0%	0.0%	Real-Time Change

P2-24 F218H	Torque Limit Mode 0: No differentiation between motoring and generating 1: Differentiation between motoring and generating	0~1	0	Stop Change
P2-25 F219H	SVC Mode Encoder Speed Measurement Enable 0: Speed measurement disable 1: Speed measurement enable	0~1	0	Real-Time Change
P2-26 F21AH	Encoder Line Count Error Masking 0: Not Shielded 1: Shielded	0~1	0	Real-Time Change
P2-27 F21BH	Weak Magnetic Depth	1~50	5	Real-Time Change
P2-28 F21CH	Initial Position Detection Current	50~180%	80%	Real-Time Change
P2-29 F21DH	Initial Position Detection 0: Detect each startup 1: Do not detect 2: Detect on first startup after power-up Initial position angle detection is generally used for SVC. Its advantages include no reversal at startup, but the downside is some noise during startup. It must be set to 0 for applications where reversal is not allowed at startup and the rotor position of the motor changes after stopping; otherwise, it can be set to 1 or 2. FVC only detects under ABZ encoder conditions and only during the first operation after power-up; it is advised not to modify this setting to avoid the risk of runaway.	0~2	0	Real-Time Change

P2-30 F21EH	Speed Loop Mode Selection	0~1	0	Real-Time Change
P2-31 F21FH	Maximum Output Adjustment Coefficient Synchronous Machine Salient Pole Adjustment Coefficient	50~500	100	Real-Time Change
P2-32 F220H	Maximum Torque Current Ratio Control Enable 0: Disable 1: Enable	0~1	0	Real-Time Change
P2-33 F221H	Feedforward Compensation Mode 0: No compensation 1: Add back electromotive force feedforward compensation 2: Add voltage feedforward compensation Only valid in FVC mode.	0~2	0	Real-Time Change
P2-34 F222H	Current Loop KP during Tuning	1~100	6	Real-Time Change
P2-35 F223H	Current Loop KI during Tuning	1~100	6	Real-Time Change
P2-36 F224H	Z Signal Correction Enable	0~1	1	Real-Time Change
P2-37 F225H	Synchronous Machine SVC Speed Filter Level	10~1000	100	Real-Time Change
P2-38 F226H	Synchronous Machine SVC Speed Estimation Proportional Gain	5~200	40	Real-Time Change
P2-39 F227H	Synchronous Machine SVC Speed Estimation Integral Gain	5~500	30	Real-Time Change
P2-40 F228H	Synchronous Machine SVC Initial Excitation Current Limit	0~200	30	Real-Time Change
P2-41 F229H	Synchronous Machine SVC Minimum Carrier Frequency	0.8~P0-15 kHz	1.5kHz	Real-Time Change

P2-42 F22AH	Low Frequency Operation Mode	0~1	0	Real-Time Change
P2-43 F22BH	Low Frequency Frequency Step	0.0005~1.0000	0.0010	Real-Time Change
P2-44 F22CH	Synchronous Machine Initial Position Angle Detection Current	0~120	50	Real-Time Change
P2-45 F22DH	Synchronous Machine SVC Speed Tracking	0~1	0	Real-Time Change
P2-46 F22EH	Zero Servo Enable	0~1	0	Real-Time Change
P2-47 F22FH	Zero Servo Switching Frequency	0.00~P2-02 Hz	0.30Hz	Real-Time Change
P2-48 F230H	Zero Servo Speed Loop Proportional Gain	1~100	10	Real-Time Change
P2-49 F231H	Zero Servo Speed Loop Integral Time	0.01~10.00	0.50	Real-Time Change
P2-50 F232H	Stop Inversion Disable	0~1	0	Real-Time Change
P2-51 F233H	Online Tuning Enable 0: Disable 1: Tune before first operation after power-up 2: Tune before operation	0~2	0	Real-Time Change
P2-52 F234H	Online Back Electromotive Force Identification 0: Disable 1: Enable	0~1	0	Stop Change
P2-53 F235H	Initial Position Compensation Angle	0.0~359.9°	0.0°	Real-Time Change

P3 - V/F Control Parameters 1

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P3-00 F300 H	V/F Curve Setting 0: Straight-Line V/F Curve 1: Multi-Point V/F Curve 2: Square V/F Curve 3: 1.2-Power V/F Curve 4: 1.4-Power V/F Curve 5: Reserved 6: 1.6-Power V/F Curve 7: Reserved 8: 1.8-Power V/F Curve 9: Reserved 10: Complete V/F Separation 11: Half V/F Separation	0 ~ 11	0	Shutdown Change
P3-01 F301H	Torque Boost	0.0 ~ 30.0%	Model Determination	Real-Time Change
P3-02 F302H	Torque Boost Cutoff Frequency	0.00 ~ P0-10Hz	50.00Hz	Shutdown Change
P3-03 F303H	Multi-Point V/F Frequency Point 1	0.00 ~ P3-05Hz	0.00Hz	Shutdown Change
P3-04 F304H	Multi-Point V/F Voltage Point 1	0.0 ~ 100.0%	0.0%	Shutdown Change
P3-05 F305H	Multi-Point V/F Frequency Point 2	P3-03 ~ P3-07Hz	0.00Hz	Shutdown Change
P3-06 F306H	Multi-Point V/F Voltage Point 2	0.0 ~ 100.0%	0.0%	Shutdown Change
P3-07	Multi-Point V/F Frequency	P3-05 ~	0.00Hz	Shutdown

F307H	Point 3	P1-04Hz		Change

P3-08 F308H	Multi-Point V/F Voltage Point 3	0.0 ~ 100.0%	0.0%	Shutdown Change
P3-09 F309H	Slip Compensation Coefficient	0.0 ~ 200.0%	0.0%	Real-Time Change
P3-10 F30AH	V/F Overexcitation Gain	0 ~ 200	64	Real-Time Change
P3-11 F30BH	V/F Oscillation Suppression Gain	0 ~ 100	Model Determination	Real-Time Change
P3-12 F30CH	V/F Oscillation Suppression Gain Mode	0 ~ 4	3	Real-Time Change
P3-13 F30DH	V/F Separation Voltage Source 0: Digital Setting (P3-14) 1: AI1 2: AI2 3: AI3 4: PULSE Setting (DI5) 5: Multi-Segment Command 6: Simple PLC 7: PID 8: Communication Reference	0 ~ 8	0	Real-Time Change
P3-14 F30EH	V/F Separation Voltage Source Digital Setting	0 ~ P1-02 V	0V	Real-Time Change
P3-15 F30FH	V/F Separation Voltage Rise Time	0.0 ~ 1000.0s	0.0s	Real-Time Change
P3-16 F310H	V/F Separation Voltage Drop Time	0.0 ~ 1000.0s	0.0s	Real-Time Change

P3-17 F311H	V/F Separation Stop Mode Selection	0 ~ 1	0	Shutdown Change
	0: Frequency/voltage reduce to 0 independently 1: Voltage reduces to 0 before frequency reduces			

P3-18 F312H	Overcurrent Stall Action Current	50 ~ 200%	Model Determination	Shutdown Change
P3-19 F313H	Overcurrent Stall Suppression 0: Invalid 1: Valid	0 ~ 1	1	Shutdown Change
P3-20 F314H	Overcurrent Stall Suppression Gain	0 ~ 100	20	Real-Time Change
P3-21 F315H	Double Speed Overcurrent Stall Action Current Compensation Coefficient	50 ~ 200%	50%	Shutdown Change
P3-22 F316H	Overvoltage Stall Action Voltage	650.0 ~ 800.0V	Model Determination	Shutdown Change
P3-23 F317H	Overvoltage Stall Suppression 0: Invalid 1: Valid	0 ~ 1	1	Shutdown Change
P3-24 F318H	Overvoltage Stall Suppression Frequency Gain	0 ~ 100	30	Real-Time Change
P3-25 F319H	Overvoltage Stall Suppression Voltage Gain	0 ~ 100	30	Real-Time Change
P3-26 F31AH	Overvoltage Stall Maximum Rising Frequency Limit	0 ~ 50Hz	5Hz	Shutdown Change
P3-27	Slip Compensation Filter	0.1 ~ 10.0s	0.5s	Shutdown

F31BH	Time			Change

P4 - Input Terminals

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P4-00 F400H	DI1 Terminal Function Selection	0 ~ 63	1	Shutdown Change
	0: No Function 1: Forward (FWD) Running 2: Reverse (REV) Running 3: Three-Wire Run Control 4: Forward Jog (FJOG) 5: Reverse Jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free Stop 9: Fault Reset (RESET) 10: Running Pause 11: External Fault Normally Open Input 12: Multi-Segment Command Terminal 1 13: Multi-Segment Command Terminal 2 14: Multi-Segment Command Terminal 3 15: Multi-Segment Command Terminal 4 16: Acceleration/Deceleration Selection Terminal 1 17: Acceleration/Deceleration Selection Terminal 2 18: Frequency Command Switching 19: UP/DOWN Setting Reset 20: Control Command Switch Terminal 1 21: Acceleration/Deceleration Prohibited 22: PID Pause 23: Simple PLC Status Reset 24: Swing Frequency Pause 25: Counter Input 26: Counter Reset 27: Length Count Input 28: Length Reset 29: Torque Control Prohibited 30: Pulse Frequency Input (DI5 Only) 31: Reserved 32: Immediate DC Brake 33: External Fault Normally Closed Input			

	34: Frequency Modification Enabled 35: PID Action Direction Reverse 36: External Stop/Shutdown Terminal 1 37: Control Command Switch Terminal 2 38: PID Integral Pause 39: Frequency Source X/Preset Frequency Switch 40: Frequency Source Y/Preset Frequency Switch 41: Motor Terminal Selection Function 42: Reserved 43: PID Parameter Switch 44: User-Defined Fault 1 45: User-Defined Fault 2 46: Speed Control/Torque Control Switch 47: Emergency Stop 48: External Stop/Shutdown Terminal 1 49: Deceleration DC Brake 50: Running Time Reset 51: Two-Wire/Three-Wire Control Switch 52: Reverse Prohibited 53 ~ 63: Reserved			
P4-01 F401H	DI2 Terminal Function Selection	0 ~ 63	8	Shutdown Change
	Same as P4-00			
P4-02 F402H	DI3 Terminal Function Selection	0 ~ 63	9	Shutdown Change
	Same as P4-00			
P4-03 F403H	DI4 Terminal Function Selection	0 ~ 63	12	Shutdown Change
	Same as P4-00			
P4-04 F404H	DI5 Terminal Function Selection	0 ~ 63	13	Shutdown Change
	Same as P4-00			
P4-05 F405H	DI6 Terminal Function Selection	0 ~ 63	0	Shutdown Change
	Same as P4-00			
P4-06 F406H	DI7 Terminal Function Selection	0 ~ 63	0	Shutdown Change
	Same as P4-00			
P4-07 F407H	DI8 Terminal Function Selection	0 ~ 63	0	Shutdown Change

<table>
<tr><td></td><td colspan="4">Same as P4-00</td></tr>
<tr><td>P4-08
F408H</td><td>DI9 Terminal Function Selection</td><td>0 ~ 63</td><td>0</td><td>Shutdown Change</td></tr>
<tr><td></td><td colspan="4">Same as P4-00</td></tr>
<tr><td>P4-09
F409H</td><td>DI10 Terminal Function Selection</td><td>0 ~ 63</td><td>0</td><td>Shutdown Change</td></tr>
<tr><td></td><td colspan="4">Same as P4-00</td></tr>
<tr><td>P4-10
F40AH</td><td>DI Filter Time</td><td>0.000 ~ 1.000s</td><td>0.010s</td><td>Real-Time Change</td></tr>
<tr><td>P4-11
F40BH</td><td>Terminal Command Mode</td><td>0 ~ 3</td><td>0</td><td>Shutdown Change</td></tr>
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 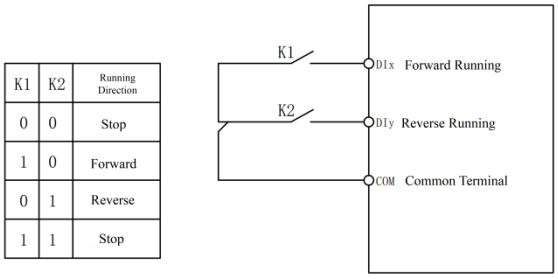

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 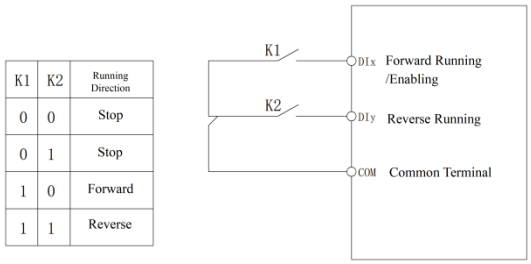

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 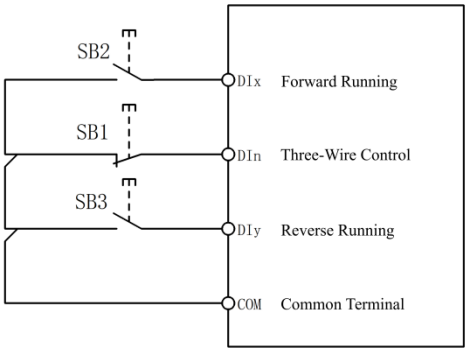
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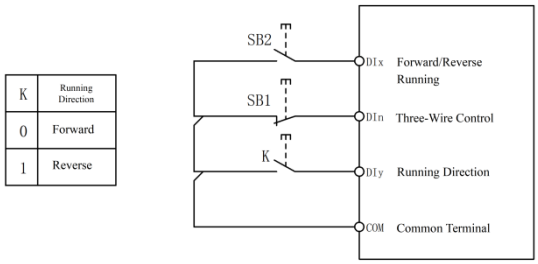
	3: Three-Wire Type 2  			
P4-12 F40CH	Terminal UP/DOWN Change Rate	0.001 ~ 65.535Hz/s	1.000Hz/s	Real-Time Change
P4-13 F40DH	AI Curve 1 Minimum Input	0.00 ~ P4-15 V	0.00V	Real-Time Change
P4-14 F40EH	AI Curve 1 Minimum Input Setting	-100.0 ~ 100.0%	0.0%	Real-Time Change
P4-15 F40FH	AI Curve 1 Maximum Input	P4-13 ~ 10.00V	10.00V	Real-Time Change
P4-16 F410H	AI Curve 1 Maximum Input Setting	-100.0~100.0%	100.0%	Real-Time Change
P4-17 F411H	AI1 Filter Time	0.00 ~ 10.00s	0.10s	Real-Time Change
P4-18 F412H	AI Curve 2 Minimum Input	0.00 ~ P4-20 V	0.00V	Real-Time Change
P4-19 F413H	AI Curve 2 Minimum Input Setting	-100.0 ~ 100.0%	0.0%	Real-Time Change
P4-20 F414H	AI Curve 2 Maximum Input	P4-18 ~ 10.00V	10.00V	Real-Time Change
P4-21 F415H	AI Curve 2 Maximum Input Setting	-100.0~100.0%	100.0%	Real-Time Change

P4-22 F416H	AI2 Filter Time	0.00 ~ 10.00s	0.10s	Real-Time Change
P4-23 F417H	AI Curve 3 Minimum Input	-10.00 ~ P4-25 V	-10.00V	Real-Time Change
P4-24 F418H	AI Curve 3 Minimum Input Setting	-100.0 ~ 100.0%	-100.0%	Real-Time Change
P4-25 F419H	AI Curve 3 Maximum Input	P4-23 ~ 10.00V	10.00V	Real-Time Change
P4-26 F41AH	AI Curve 3 Maximum Input Setting	-100.0~100.0%	100.0%	Real-Time Change
P4-27 F41BH	AI3 Filter Time	0.00 ~ 10.00s	0.10s	Real-Time Change
P4-28 F41CH	PULSE Minimum Input	0.00 ~ P4-30 kHz	0.00kHz	Real-Time Change
P4-29 F41DH	PULSE Minimum Input Setting	-100.0 ~ 100.0%	0.0%	Real-Time Change
P4-30 F41EH	PULSE Maximum Input	P4-28 ~ 100.00kHz	50.00kHz	Real-Time Change
P4-31 F41FH	PULSE Maximum Input Setting	-100.0 ~ 100.0%	100.0%	Real-Time Change
P4-32 F420H	PULSE Filter Time	0.00 ~ 10.00s	0.10s	Real-Time Change
P4-33 F421H	AI Curve Selection Ones: AI1 Curve Selection 1: Curve 1 (2 Points, P4-13 ~ P4-16) 2: Curve 2 (2 Points, P4-18 ~ P4-21) 3: Curve 2 (2 Points, P4-23 ~ P4-26)	111H ~ 555H	321H	Real-Time Change

	4: Curve 4 (4 Points, A6-00 ~ A6-07) 5: Curve 5 (4 Points, A6-08 ~ A6-15) Tens: AI2 Curve Selection 1: Curve 1 (2 Points, P4-13 ~ P4-16) 2: Curve 2 (2 Points, P4-18 ~ P4-21) 3: Curve 2 (2 Points, P4-23 ~ P4-26) 4: Curve 4 (4 Points, A6-00 ~ A6-07) 5: Curve 5 (4 Points, A6-08 ~ A6-15) Hundreds: AI3 Curve Selection 1: Curve 1 (2 Points, P4-13 ~ P4-16) 2: Curve 2 (2 Points, P4-18 ~ P4-21) 3: Curve 2 (2 Points, P4-23 ~ P4-26) 4: Curve 4 (4 Points, A6-00 ~ A6-07) 5: Curve 5 (4 Points, A6-08 ~ A6-15)			
P4-34 F422H	AI Lower Limit Selection	000H ~ 111H	000H	Real-Time Change
	Ones: AI1 Below Minimum Input Setting 0: Minimum Input Setting 1: 0.0% Tens: AI2 Below Minimum Input Setting 0: Minimum Input Setting 1: 0.0% Hundreds: AI3 Below Minimum Input Setting 0: Minimum Input Setting 1: 0.0%			
P4-35 F423H	DI1 Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
P4-36 F424H	DI2 Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
P4-37 F425H	DI3 Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
P4-38 F426H	DI Terminal Active Mode Selection 1	00000 ~ 11111	00000	Real-Time Change
	Ones: DI1 0: Active High 1: Active Low Tens: DI2 0: Active High 1: Active Low			

	Hundreds: DI3 0: Active High 1: Active Low Thousands: DI4 0: Active High 1: Active Low Ten Thousands: DI5 0: Active High 1: Active Low			
P4-39 F427H	DI Terminal Active Mode Selection 2	00000 ~ 11111	00000	Real-Time Change
	Ones: DI6 0: Active High 1: Active Low Tens: DI7 0: Active High 1: Active Low Hundreds: DI8 0: Active High 1: Active Low Thousands: DI9 0: Active High 1: Active Low Ten Thousands: DI10 0: Active High 1: Active Low			
P4-40 F428H	AI Mode Selection	000H ~ 707H	700H	Real-Time Change
	Hexadecimal to Binary Conversion ,upper 8 bits are disconnect judgment, lower 8 bits are voltage type/current type selection. bit0: AI1, bit1: AI2, bit2: AI3, (0: Voltage type; 1: Current type) bit8: AI1, bit9: AI2, bit10: AI3, (0: Reset on disconnect; 1: Maintain last value on disconnect)			

P5 - Output Terminals

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P5-00 F500H	Multi-Function Terminal Output Selection	0 ~ 1	0	Real-Time Change
	0: Pulse Output (FMP) 1: Digital Output/ON-OFF Output(FMR)			
P5-01 F501H	FMR Output Function Selection	0 ~ 42	0	Real-Time Change
	0: No Output 1: AC Drive Running 2: Fault Stop Output 3: Frequency (Level) Detection FDT1 Output 4: Frequency Reached 5: Zero Speed Running (Stop OFF) 6: Motor Overload Pre-Alarm 7: AC Drive Overload Pre-Alarm 8: Set Count Value Reached 9: Specified Count Value Reached 10: Length Reached 11: Simple PLC Cycle Completed 12: Cumulative Running Time Reached 13: Frequency Limited 14: Torque Limited 15: Ready to Run 16: AI1>AI2 17: Upper Limit Frequency Reached 18: Lower Limit Frequency Reached (Stop OFF) 19: Undervoltage (Status) Output 20: Communication Control 21: Reserved 22: Reserved 23: Zero Speed Running (Stop ON) 24: Cumulative Power-On Time Reached 25: Frequency (Level) Detection FDT2 Output 26: Output When Frequency 1 Reached 27: Output When Frequency 2 Reached 28: Current 1 Reached Output 29: Current 2 Reached Output			

	30: Timing Reached Output 31: AI1 Input Exceeded 32: Load Shedding 33: Reverse Running 34: Zero Current State 35: Module Temperature Reached 36: Output Current Exceeded 37: Lower Limit Frequency Reached (Stop ON) 38: Alarm or Fault Output 39: Motor Overheat Output 40: Running Time Reached 41: Fault Stop (Except Undervoltage) Output 42: Stop Brake Output			
P5-02 F502H	Control Board Relay Output Function Selection	0 ~ 42	2	Real-Time Change
	Same as P5-01			
P5-03 F503H	Expansion Card Relay Output Function Selection	0 ~ 42	0	Real-Time Change
	Same as P5-01			
P5-04 F504H	DO1 Output Function Selection	0 ~ 42	1	Real-Time Change
	Same as P5-01			
P5-05 F505H	Expansion Card DO2 Output Function Selection	0 ~ 42	4	Real-Time Change
	Same as P5-01			
P5-06 F506H	FMP Output Function Selection	0 ~ 17	0	Real-Time Change
	0: Running Frequency (100.0% corresponds to maximum frequency F0-10) 1: Set Frequency (100.0% corresponds to maximum frequency F0-10) 2: Output Current (100.0% corresponds to twice the motor rated current) 3: Output Torque (Absolute Value) (100.0% corresponds to twice the motor rated torque, absolute value) 4: Output Power (100.0% corresponds to twice the motor rated power) 5: Output Voltage (100.0% corresponds to 1.2 times the motor rated voltage) 6: PULSE Input (100.0% corresponds to 100.0kHz) 7: AI1 (100.0% corresponds to 10V) 8: AI2 (100.0% corresponds to 10V) 9: AI3 (Expansion Card) (100.0% corresponds to 10V) 10: Length (100.0% corresponds to PB-05) 11: Count Value (100.0% corresponds to PB-08)			

	12: Communication Setting (100.0% corresponds to AO Communication Set) 13: Motor Speed (100.0% corresponds to maximum frequency F0-10) 14: Output Current (100.0% corresponds to 1000.0A) 15: Bus Voltage (100.0% corresponds to 1000.0V) 16: Output Torque (100.0% corresponds to twice the motor rated torque, actual value) 17: Actual Output Torque (100.0% corresponds to twice the torque upper limit)			
P5-07 F507H	AO1 Output Function Selection	0 ~ 17	0	Real-Time Change
	Same as P5-06			
P5-08 F508H	Expansion Card AO2 Output Function Selection	0 ~ 17	1	Real-Time Change
	Same as P5-06			
P5-09 F509H	Maximum FMP Output Frequency	0.01 ~ 100.00kHz	50.00kHz	Real-Time Change
	Same as P5-06			
P5-10 F50AH	AO1 Zero Offset Coefficient	-100.0 ~ 100.0%	0.0%	Real-Time Change
	Same as P5-06			
P5-11 F50BH	AO1 Gain	-10.00 ~ 10.00	1.00	Real-Time Change
P5-12 F50CH	AO2 Zero Offset Coefficient	-100.0 ~ 100.0%	0.0%	Real-Time Change
	Same as P5-06			
P5-13 F50DH	AO2 Gain	-10.00 ~ 10.00	1.00	Real-Time Change
P5-17 F511H	FMR Output Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
	Same as P5-06			
P5-18 F512H	RELAY1 Output Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
P5-19 F513H	RELAY2 Output Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
	Same as P5-06			
P5-20 F514H	DO1 Output Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change

	Same as P5-06

P5-21 F515H	DO2 Output Delay Time	0.0 ~ 3600.0s	0.0s	Real-Time Change
	Same as P5-06			
P5-22 F516H	DO Output Terminal Active State Selection	00000 ~ 11111	00000	Real-Time Change
	Ones: FMR 0: Positive Logic 1: Negative Logic Tens: RELAY1 0: Positive Logic 1: Negative Logic Hundreds: RELAY2 0: Positive Logic 1: Negative Logic Thousands: DO1 0: Positive Logic 1: Negative Logic Tens Thousands: DO2 0: Positive Logic 1: Negative Logic			
P5-23 F517H	AO Mode Selection	0H ~ 3H	0H	Real-Time Change
	Hexadecimal conversion to binary, lower 8 bits for voltage/current type selection bit0: AO1, bit1: AO2, (0: Voltage type; 1: Current type)			

P6- Start/Stop Control

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P6-00 F600H	Start Mode	0 ~ 3	0	Real-Time Change
	0: Direct Start 1: Speed Tracking Restart 2: Pre-Excitation Start (for asynchronous motors) 3: SVC Quick Start			
P6-01 F601H	Speed Tracking Method	0 ~ 2	0	Real-Time Change
	0: Start from Stopping Frequency 1: Start from Operating Frequency 2: Start from Maximum Frequency			
P6-02 F602H	Speed Tracking Rate	1 ~ 100	20	Unchangeable
P6-03 F603H	Start Frequency	0.00 ~ 10.00Hz	0.00Hz	Real-Time Change
P6-04 F604H	Start Frequency Hold Time	0.0 ~ 100.0s	0.0s	Shutdown Change
P6-05 F605H	Start DC Brake Current	0 ~ 100	50	Shutdown Change
P6-06 F606H	Start DC Brake Time	0.0 ~ 100.0s	0.0s	Shutdown Change
P6-07 F607H	Acceleration/Deceleration Mode	0 ~ 2	0	Shutdown Change
	0: Linear Acceleration/Deceleration 1: Static S-Curve Acceleration/Deceleration 2: Dynamic S-Curve Acceleration/Deceleration			
P6-08 F608H	S-Curve Initial Segment Time Ratio	0.0 ~ 100.0%	30.0%	Shutdown Change
P6-09	S-Curve Final Segment Time Ratio	0.0 ~	30.0%	Shutdown

F609H		100.0%		Change
P6-10 F60AH	Stop Mode 0: Deceleration Stop 1: Free Stop	0 ~ 1	0	Real-Time Change
P6-11 F60BH	Stop DC Brake Start Frequency	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P6-12 F60CH	Stop DC Brake Wait Time	0.0 ~ 100.0s	0.0s	Real-Time Change
P6-13 F60DH	Stop DC Brake Current	0.0 ~ 100.0%	50.0%	Real-Time Change
P6-14 F60EH	Stop DC Brake Time	0.0s ~ 100.0s	0.0s	Real-Time Change
P6-15 F60FH	Brake Utilization Rate	0 ~ 100%	100.0%	Real-Time Change
P6-16 F610H	Speed Tracking Closed-Loop Current (KP)	0 ~ 1000	500	Unchangeable
P6-17 F611H	Speed Tracking Closed-Loop Current (KI)	0 ~ 1000	800	Unchangeable
P6-18 F612H	Speed Tracking Closed-Loop Current Magnitude	30 ~ 200%	100%	Unchangeable
P6-19 F613H	Speed Tracking Closed-Loop Current Lower Limit	10 ~ 100%	30%	Unchangeable
P6-20 F614H	Speed Tracking Voltage Rise Time	0.5 ~ 3.0s	1.1s	Unchangeable
P6-21 F615H	Demagnetization Time (SVC Active)	0.00s ~ 5.00s	0.50s	Real-Time Change

P7 - Keypad and Display

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P7-01 F701H	MF.K Function Selection	0 ~ 4	0	Shutdown Change
	0: MF.K Invalid 1: Switch between operation panel and terminal or communication command channel (valid only when command source is terminal or communication) 2: Forward/Reverse switching (valid only when command source is operation panel) 3: Forward Jog (valid only when command source is operation panel) 4: Reverse Jog (valid only when command source is operation panel)			
P7-02 F702H	STOP/RESET Function	0 ~ 1	1	Real-Time Change
	0: Only Active in Keypad Control Mode 1: Active in Any Control Modes			
P7-03 F703H	LED Running Display Parameter 1	0 ~ FFFFH	1FH	Real-Time Change
	Hexadecimal to binary conversion. For corresponding bits, 0 indicates not displayed; 1 indicates displayed. bit0: Running Frequency (Hz) bit1: Set Frequency (Hz) bit2: Bus Voltage (V) bit3: Output Voltage (V) bit4: Output Current (A) bit5: Output Power (kW) bit6: Output Torque (%) bit7: DI Input Status bit8: DO Output Status bit9: AI1 Voltage (V) bit10: AI2 Voltage (V) bit11: AI3 Voltage (V) bit12: Count Value bit13: Length Value bit14: Load Speed Display bit15: PID Setting			
P7-04 F704H	LED Running Display Parameter 2	0 ~ FFFFH	0H	Real-Time Change
	bit0: PID Feedback			

	Hexadecimal to binary conversion. For corresponding bits, 0 indicates not displayed; 1 indicates displayed. bit1: PLC Phase bit2: PULSE Input Frequency (kHz) bit3: Feedback Frequency (Hz) bit4: Remaining Running Time bit5: AI1 Voltage (V) Before Correction bit6: AI2 Voltage (V) Before Correction bit7: AI3 Voltage (V) Before Correction bit8: Motor Speed bit9: Current Power-On Time (Hour) bit10: Current Running Time (Min) bit11: PULSE Input Frequency (Hz) bit12: Communication Setting Value bit13: Encoder Feedback Speed bit14: Primary Frequency X Display bit15: Auxiliary Frequency X Display			
P7-05 F705H	LED Stop Display Parameter	0 ~ FFFFH	33H	Real-Time Change
	Hexadecimal to binary conversion. For corresponding bits, 0 indicates not displayed; 1 indicates displayed. bit0: Set Frequency (Hz) bit1: Bus Voltage (V) bit2: DI Input Status bit3: DO Output Status bit4: AI1 Voltage (V) bit5: AI2 Voltage (V) bit6: AI3 Voltage (V) bit7: Count Value bit8: Length Value bit9: PLC Phase bit10: Load Speed bit11: PID Setting bit12: PULSE Input Frequency (kHz)			
P7-06 F706H	Load Transmission Ratio	0.001 ~ 65.000	1.000	Real-Time Change
	Indicates the ratio of actual load to motor speed			
P7-07 F707H	Load Speed Display Decimal Places	10~23	20	Real-Time Change

	Units: Number of decimal points for U0-14 0: 0 decimal places 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places Tens: Number of decimal points for U0-19/U0-29 0: 0 decimal places 1: 1 decimal place 2: 2 decimal places			
P7-08 F708H	Accumulated Power-On Time	0~65535h	0.00	Unchangeable
	Inverter's Cumulative Power-On Time			
P7-09 F709H	Cumulative Running Time	0 ~ 65535h	0h	Unchangeable
	Inverter's Cumulative Operating Time			
P7-10 F70AH	Cumulative Power Consumption	0~65535kWh	0kWh	Unchangeable
	Inverter's Cumulative Power Consumption			
P7-11 F70BH	Function Version Number	0.00 ~ 655.35	0.00	Unchangeable
P7-12 F70CH	Load Speed Display Decimal Places	00 ~ 22	20	Real-Time Change
	Ones: Decimal Places for U0-14 0: No Decimal Places 1: One Decimal Places 2: Two Decimal Places Tens: Decimal Places for U0-19/U0-29 0: No Decimal Places 1: One Decimal Places 2: Two Decimal Places			
P7-13 F70DH	Cumulative Power-On Time	0 ~ 65535h	0h	Unchangeable
P7-14 F70EH	Cumulative Power Consumption	0.00 ~ 655.35	0.00	Unchangeable
P7-15 F70FH	Temporary Performance Version Number	0.00 ~ 655.35	0.00	Unchangeable
P7-16 F710H	Temporary Function Version Number	0.00 ~ 655.35	0.00	Unchangeable

P8 - Auxiliary Functions

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P8-00 F800H	Jog Running Frequency	0.00 ~ P0-10Hz	2.00Hz	Real-Time Change
P8-01 F801H	Jog Acceleration Time	0.0 ~ 6500.0s	20.0s	Real-Time Change
P8-02 F802H	Jog Deceleration Time	0.0 ~ 6500.0s	20.0s	Real-Time Change
P8-03 F803H	Acceleration Time 2	0.0 ~ 6500.0s	20.0s	Real-Time Change
P8-04 F804H	Deceleration Time 2	0.0 ~ 6500.0s	20.0s	Real-Time Change
P8-05 F805H	Acceleration Time 3	0.0 ~ 6500.0s	20.0s	Real-Time Change
P8-06 F806H	Deceleration Time 3	0.0 ~ 6500.0s	20.0s	Real-Time Change
P8-07 F807H	Acceleration Time 4	0.0 ~ 6500.0s	0.0s	Real-Time Change
P8-08 F808H	Deceleration Time 4	0.0 ~ 6500.0s	0.0s	Real-Time Change
P8-09 F809H	Hopping Frequency 1	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P8-10 F80AH	Hopping Frequency 2	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P8-11 F80BH	Hopping Frequency Amplitude	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change

P8-12 F80CH	Forward/Reverse Dead Time	0.0 ~ 3000.0s	0.0s	Real-Time Change
P8-13 F80DH	Reverse Frequency 0: Allowed 1: Prohibited	0 ~ 1	0	Real-Time Change
P8-14 F80EH	"Frequency Below Lower Limit Frequency" Running Mode 0: Run at Lower Limit Frequency 1: Stop 2: Run at Zero Speed	0 ~ 2	0	Real-Time Change
P8-15 F80FH	Droop Rate	0.00 ~ 10.00Hz	0.0Hz	Real-Time Change
P8-16 F810H	Set Power-on Arrival Time	0 ~ 65000h	0h	Real-Time Change
P8-17 F811H	Set Running Arrival Time	0 ~ 65000h	0h	Real-Time Change
P8-18 F812H	Start Protection Selection 0: No Protection 1: Protection	0 ~ 1	0	Real-Time Change
P8-19 F813H	Frequency Detection Value 1	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
P8-20 F814H	Frequency Detection Hysteresis Value 1	0.0 ~ 100.0%	5.0%	Real-Time Change
P8-21 F815H	Detection Width (when frequency reached)	0.0 ~ 100.0%	0.0%	Real-Time Change
P8-22 F816H	Hopping Frequency During Acceleration/Deceleration 0: Invalid 1: Valid	0 ~ 1	0	Real-Time Change

P8-25 F819H	Switch Frequency Point at 1/2 Acceleration Time	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P8-26 F81AH	Switch Frequency Point at 1/2 Deceleration Time	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
P8-27 F81BH	Terminal Jog Priority 0: Invalid 1: Valid	0 ~ 1	0	Real-Time Change
P8-28 F81CH	Frequency Detection Value 2	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
P8-29 F81DH	Frequency Detection Hysteresis Value 2	0.0 ~ 100.0%	5.0%	Real-Time Change
P8-30 F81EH	Frequency Arrival Detection Value 1	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
P8-31 F81FH	Frequency Arrival Detection Amplitude 1	0.0 ~ 100.0%	0.0%	Real-Time Change
P8-32 F820H	Frequency Arrival Detection Value 2	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
P8-33 F821H	Frequency Arrival Detection Amplitude 2	0.0 ~ 100.0%	0.0%	Real-Time Change
P8-34 F822H	Zero Current Detection Level	0.0 ~ 300.0%	5.0%	Real-Time Change
P8-35 F823H	Zero Current Detection Delay Time	0.01 ~ 600.00s	0.10s	Real-Time Change
P8-36 F824H	Amplitude of Output Current Exceeded	0.0 ~ 300.0%	200.0%	Real-Time Change
P8-37 F825H	Detection Delay Time of Output Current Exceeded	0.00 ~ 600.00s	0.00s	Real-Time Change

P8-38 F826H	Arbitrary Current Reached 1	0.0 ~ 300.0%	100.0%	Real-Time Change
P8-39 F827H	Width of Arbitrary Current Reached 1	0.0 ~ 300.0%	0.0%	Real-Time Change
P8-40 F828H	Arbitrary Current Reached 2	0.0 ~ 300.0%	100.0%	Real-Time Change
P8-41 F829H	Width of Arbitrary Current Reached 2	0.0 ~ 300.0%	0.0%	Real-Time Change
P8-42 F82AH	Timing Function Selection 0: Invalid 1: Valid	0 ~ 1	0	Shutdown Change
P8-43 F82BH	Timed Running Time Selection 0: P8-44 Setting 1: AI1 2: AI2 3: AI3	0 ~ 3	0	Shutdown Change
P8-44 F82CH	Timed Running Time	0.0 ~ 6500.0min	0.0min	Shutdown Change
P8-45 F82DH	AI1 Input Voltage Protection Lower Limit	0.00 ~ P8-46V	3.10V	Real-Time Change
P8-46 F82EH	AI1 Input Voltage Protection Upper Limit	P8-45 ~ 11.00V	6.80V	Real-Time Change
P8-47 F82FH	Module Temperature Reached	0 ~ 100℃	75℃	Real-Time Change
P8-48 F830H	Cooling Fan Control 0: Fan Runs During Operation 1: Fan Runs Continuously	0 ~ 1	0	Shutdown Change
P8-49 F831H	Wake-Up Frequency	P8-51 ~ P0-10Hz	0.00Hz	Real-Time Change

P8-50 F832H	Wake-Up Delay Time	0.0 ~ 6500.0s	0.0s	Real-Time Change
P8-51 F833H	Sleep Frequency	0.00 ~ P8-49Hz	0.00Hz	Real-Time Change
P8-52 F834H	Sleep Delay Time	0.0 ~ 6500.0s	0.0s	Real-Time Change
P8-53 F835H	Running Arrival Time Setting	0.0 ~ 6500.0min	0.0min	Shutdown Change
P8-54 F836H	Output Power Correction Factor	0.0 ~ 200.0%	100.0%	Real-Time Change

P9 - Faults and Protection

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
P9-00 F900H	Motor Overload Protection Selection 0: Prohibited 1: Allowed	0 ~ 1	1	Real-Time Change
P9-01 F901H	Motor Overload Protection Gain	0.20 ~ 10.00	1.00	Real-Time Change
P9-02 F902H	Motor Overload Pre-Alarm Coefficient	50 ~ 100%	80%	Real-Time Change
P9-03 F903H	Overvoltage Stall Gain	0 ~ 100	30	Real-Time Change
P9-04 F904H	Overvoltage Stall Protection Voltage	200~2000V	Model-Based	Real-Time Change
P9-05 F905H	Overcurrent Stall Gain	0 ~ 100	20	Real-Time Change
P9-06 F906H	Overcurrent Stall Protection Current	50 ~ 200A	150A	Real-Time Change
P9-07 F907H	Ground Short Circuit Protection Selection Ones: Ground Short Circuit Protection (Running) 0: Invalid 1: Valid Tens: Ground Short Circuit Protection (Before Running) 0: Invalid 1: Valid	00 ~ 11	01	Real-Time Change
P9-08 F908H	Brake Unit Action Initial Voltage	200.0~2000.0 V	Model-Based	Shutdown Change
P9-09 F909H	Count of Automatic Fault Resets	0~30	0	Real-Time Change

P9-10 F90AH	DO Action Selection During Automatic Fault Reset 0: No Action 1: Action	0 ~ 1	1	Real-Time Change
P9-11 F90BH	Interval Time for Automatic Fault Reset	0.1 ~ 100.0s	6.0s	Real-Time Change
P9-12 F90CH	Input Phase Loss/Contactor Pulling In Protection Selection Ones: Input Phase Loss Protection 0: Prohibited 1: Allowed Tens: Contactor Pulling In Protection 0: Prohibited 1: Allowed	0 ~ 11	11	Real-Time Change
P9-13 F90DH	Output Phase Loss Protection Selection Ones: Output Phase Loss Protection (Running) 0: Prohibited 1: Allowed Tens: Output Phase Loss Protection (Before Running) 0: Prohibited 1: Allowed	0 ~ 11	01	Real-Time Change
P9-14 F90EH	First Fault Type 0: No Fault 1: IGBT Fault (Err01) 2: Overcurrent During Acceleration (Err02) 3: Overcurrent During Deceleration (Err03) 4: Overcurrent at Constant Speed (Err04) 5: Overvoltage During Acceleration (Err05) 6: Overvoltage During Deceleration (Err06) 7: Overvoltage at Constant Speed (Err07) 8: Undervoltage Fault (Err08) 9: AC Drive Overload (Err09) 10: Module Overheat (Err10) 11: Reserved (Err11) 12: Input Phase Loss (Err12) 13: Output Phase Loss (Err13) 14: Reserved (Err14)	0 ~ 99	0	Unchangeable

	15: Reserved (Err15) 16: Reserved (Err16) 17: Current Detection Fault (Err17) 18: Pre-Charge Fault (Err18) 19: EEPROM Read/Write Fault (Err19) 20: Encoder Fault (Err20) 21: Reserved (Err21) 22: Reserved (Err22) 23: Parameter Self-Tuning Fault (Err23) 24: Reserved (Err24) 25: Reserved (Err25) 26: Reserved (Err26) 27: Reserved (Err27) 28: Reserved (Err28) 29: Reserved (Err29) 30: Motor Overload (Err30) 31: Motor Overheat (Err31) 32: Ground Short Circuit Fault (Err32) 33: Charging Resistor Overload (Err33) 34: External Device Fault (Err34) 35: Reserved (Err35) 36: Data Exchange Fault (Err36) 37: Cumulative Running Time Reached (Err37) 38: Cumulative Power-On Time Reached (Err38) 39: Underload (Err39) 40: Communication Fault (Err40) 41: PID Feedback Loss During Operation (Err41) 42: Excessive Speed Deviation (Err42) 43: User-Defined Fault 1 (Err43) 44: User-Defined Fault 2 (Err44) 45: Cycle-by-Cycle Current Limit Fault (Err45) 46: Reserved (Err46) 47: Motor Overspeed (Err47) 48: Magnetic Pole Position Detection Failure (Err48) 49: Motor Switching Fault During Operation (Err49) 50: SVC Stall Fault (Err50) 51: STO Fault (Err51) 52: Brake Resistor Short Circuit (Err52) 53: Brake Resistor Continuous Switch-On Timeout (Err53) 54: Abnormal Back EMF (Err54)

	55: Brake Pipe Overload (Err55) 56 ~ 99: Reserved			
P9-15 F90FH	Second Fault Type	0 ~ 99	0	Unchangeable
	Same as P9-14			
P9-16 F910H	Third (Latest) Fault Type	0 ~ 99	0	Unchangeable
	Same as P9-14			
P9-17 F911H	Frequency (Latest Fault)	0.00 ~ 655.35Hz	0.00Hz	Unchangeable
P9-18 F912H	Current (Latest Fault)	0.00 ~ 655.35A	0.00A	Unchangeable
P9-19 F913H	Bus Voltage (Latest Fault)	0.0 ~ 6553.5V	0.00V	Unchangeable
P9-20 F914H	Input Terminal Status (Latest Fault)	0 ~ 9999	0	Unchangeable
P9-21 F915H	Output Terminal Status (Latest Fault)	0 ~ 9999	0	Unchangeable
P9-22 F916H	AC Drive Status (Latest Fault)	0 ~ 65535	0	Unchangeable
P9-23 F917H	Power-On Time (Latest Fault)	0 ~ 65535min	0min	Unchangeable
P9-24 F918H	Running Time (Latest Fault)	0.0 ~ 6553.5min	0.0min	Unchangeable
P9-27 F91BH	Frequency (Second Fault)	0.00 ~ 655.35Hz	0.00Hz	Unchangeable
P9-28 F91CH	Current (Second Fault)	0.00 ~ 655.35A	0.00A	Unchangeable
P9-29 F91DH	Bus Voltage (Second Fault)	0.0 ~ 6553.5V	0.00V	Unchangeable
P9-30 F91EH	Input Terminal Status (Second Fault)	0 ~ 9999	0	Unchangeable

P9-31 F91FH	Output Terminal Status (Second Fault)	0 ~ 9999	0	Unchangeable
P9-32 F920H	AC Drive Status (Second Fault)	0 ~ 65535	0	Unchangeable
P9-33 F921H	Power-On Time (Second Fault)	0 ~ 65535min	0min	Unchangeable
P9-34 F922H	Running Time (Second Fault)	0.0 ~ 6553.5min	0.0min	Unchangeable
P9-37 F925H	Frequency (First Fault)	0.00 ~ 655.35Hz	0.00Hz	Unchangeable
P9-38 F926H	Current (First Fault)	0.00 ~ 655.35A	0.00A	Unchangeable
P9-39 F927H	Bus Voltage (First Fault)	0.0 ~ 6553.5V	0.00V	Unchangeable
P9-40 F928H	Input Terminal Status (First Fault)	0 ~ 9999	0	Unchangeable
P9-41 F929H	Output Terminal Status (First Fault)	0 ~ 9999	0	Unchangeable
P9-42 F92AH	AC Drive Status (First Fault)	0 ~ 65535	0	Unchangeable
P9-43 F92BH	Power-On Time (First Fault)	0 ~ 65535min	0min	Unchangeable
P9-44 F92CH	Running Time (First Fault)	0.0 ~ 6553.5min	0.0min	Unchangeable
P9-47 F92FH	Fault Protection Action Selection 1	00000 ~ 22222	00000	Real-Time Change
	Units: Motor Overload (Err30) 0: Free Stop 1: Default Stop Mode 2: Continue Running Tens: Input Phase Loss (Err12) 0: Free Stop 1: Default Stop Mode 2: Continue Running Hundreds: Output Phase Loss (Err13) 0: Free Stop 1: Default Stop Mode 2: Continue Running Thousands: External Fault (Err34)			

	0: Free Stop 1: Default Stop Mode 2: Continue Running Ten of Thousands: Communication Anomaly (Err40) 0: Free Stop 1: Default Stop Mode 2: Continue Running			

P9-48 F930H	Fault Protection Action Selection 2	00000 ~ 22110	00000	Real-Time Change
	Ones: Encoder/PG Card Abnormality (Err20) 0: Free Stop Tens: Parameter Read/Write Anomaly (Err19) 0: Free Stop 1: Default Stop Mode Hundreds:Inverter Overload (Err9) 0: Free Stop 1: Derated Operation Thousands: Motor Overtemperature Fault (Err31) 0: Free Stop 1: Default Stop Mode 2: Continue Running Ten of Thousands: Operation Time Reached (Err37) 0: Free Stop 1: Default Stop Mode 2: Continue Running			
P9-49 F931H	Fault Protection Action Selection 3	00000 ~ 22222	00000	Real-Time Change
	Units: User Custom Fault 1 (Err43) 0: Free Stop 1: Default Stop Mode 2: Continue Running Tens: User Custom Fault 2 (Err44) 0: Free Stop 1: Default Stop Mode 2: Continue Running Hundreds: Power-On Time Reached (Err38) 0: Free Stop 1: Default Stop Mode 2: Continue Running Thousands: Load Loss (Err39) 0: Free Stop 1: Default Stop Mode 2: Continue Running at 7% of the Motor's Rated Frequency Ten of Thousands: Running Time PID Feedback Lost (Err41) 0: Free Stop 1: Default Stop Mode 2: Continue Running			
P9-50 F932H	Fault Protection Action Selection 4	00000 ~ 22222	00000	Real-Time Change
	Ones: Excessive Speed Deviation (Err42) 0: Free Stop 1: Default Stop Mode 2: Continue Running Tens: Motor Overspeed (Err47) 0: Free Stop 1: Default Stop Mode 2: Continue Running Hundreds: Initial Position Error (Err48) 0: Free Stop 1: Default Stop Mode 2: Continue Running			

P9-54 F936H	Frequency Selection If Continue Running 0: Current Frequency 1: Set Frequency 2: Upper Limit Frequency 3: Lower Limit Frequency 4: Alternate Frequency for Abnormalities	0 ~ 4	0	Real-Time Change
P9-55 F937H	Alternate Frequency for Abnormalities	0.0 ~ 100.0%	100%	Real-Time Change
P9-56 F938H	Motor Temperature Sensor Type 0: No Motor Temperature Sensor 1: PT100 2: PT1000	0 ~ 2	0	Real-Time Change
P9-57 F939H	Motor Overheat Protection Threshold	0 ~ 200℃	110℃	Real-Time Change
P9-58 F93AH	Motor Overheat Pre-Alarm Threshold	0 ~ 200℃	90℃	Real-Time Change
P9-59 F93BH	Ride-Through Function Selection 0: Invalid 1: Bus Voltage Constant Control 2: Deceleration Stop 3: Voltage Dip Suppression	0 ~ 2	0	Shutdown Change
P9-60 F93CH	Ride-Through Recovery Voltage	80 ~ 100%	85%	Shutdown Change
P9-61 F93DH	Ride-Through Voltage Recovery Judgment Time	0.0 ~ 100.0s	0.5s	Shutdown Change
P9-62 F93EH	Ride-Through Action Voltage	60 ~ 100%	80%	Shutdown Change
P9-63 F93FH	Load Shedding Protection Selection 0: Invalid	0 ~ 1	0	Real-Time Change

	1: Valid			
P9-64 F940H	Load Shedding Detection Level	0.0 ~ 100.0%	10.0%	Real-Time Change
P9-65 F941H	Load Shedding Detection Time	0.0 ~ 60.0s	1.0s	Real-Time Change
P9-67 F943H	Overspeed Detection Value	0.0 ~ 50.0%	20%	Real-Time Change
P9-68 F944H	Overspeed Detection Time	0.0 ~ 60.0s	1.0s	Real-Time Change
P9-69 F945H	Excessive Speed Deviation Detection Value	0.0 ~ 50.0%	20%	Real-Time Change
P9-70 F946H	Excessive Speed Deviation Detection Time	0.0 ~ 60.0s	5.0s	Real-Time Change
P9-71 F947H	Ride-Through Gain (Kp)	0 ~ 100	40	Real-Time Change
P9-72 F948H	Ride-Through Integral Coefficient (Ki)	0 ~ 100	30	Real-Time Change
P9-73 F949H	Ride-Through Action Deceleration Time	0.0 ~ 300.0s	20.0s	Real-Time Change

P9-74 F94AH	UVW Encoder Fault Enable	0~1	1	Real-Time Change
P9-75 F94BH	Initial Position Fault Enable	0~11	11	Real-Time Change
	Tens: Load Zero Position Angle Tuning Fault Enable 0: Disable; 1: Enable			
P9-76 F94CH	Encoder Disconnection Detection Enable	0 ~1	1	Real-Time Change

P9-77 F94DH	Voltage Dip Suppression Time	0.1 ~600.0S	0.5S	Real-Time Change

PA - Process Control PID Functions

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
PA-00 FA00H	PID Reference Source	0 ~ 6	0	Real-Time Change
	0: Function Code (PA-01) Setting 1: AI1 2: AI2 3: AI3 4: PULSE Setting (DI5) 5: Communication Reference 6: Multi-Segment Command Reference			
PA-01 FA01H	PID Value Reference	0.0 ~ 100.0%	50.0%	Real-Time Change
	When this parameter value is set to 100%, it corresponds to the maximum value of the feedback quantity.			
PA-02 FA02H	PID Feedback Source	0 ~ 8	0	Real-Time Change
	0: AI1 1: AI2 2: AI3 3: AI1-AI2 4: PULSE Setting (DI5) 5: Communication Reference 6: AI1+AI2 7: MAX (AI1, AI2) 8: MIN (AI1, AI2)			
PA-03 FA03H	PID Action Direction	0 ~ 1	0	Real-Time Change
	0: Direct Action (If the feedback signal is less than the PID setpoint, the inverter output frequency increases.) 1: Reverse Action (If the feedback signal is less than the PID setpoint, the inverter output frequency decreases.)			
PA-04 FA04H	PID Reference Feedback Range	0 ~ 65535	1000	Real-Time Change
	Dimensionless unit, used only to display current PID setpoint and feedback quantity.			
PA-05 FA05H	Proportional Gain (Kp1)	0.0 ~ 1000.0	20.0	Real-Time Change

	Kp determines the speed at which the deviation decreases, the larger the Kp, the faster the deviation decreases.			
PA-06 FA06H	Integral Time (Ti1)	0.01 ~ 10.00s	2.00s	Real-Time Change
	Ti determines the strength of integral adjustment, the shorter the integral time, the stronger the adjustment.			
PA-07 FA07H	Derivative Time (Td1)	0.000 ~ 10.000s	0.000s	Real-Time Change
	Td determines the strength of the adjustment of the rate of change of deviation, the longer the differential time, the stronger the adjustment.			
PA-08 FA08H	PID Reverse Cutoff Frequency	0.00 ~ P0-10Hz	0.00Hz	Real-Time Change
	Minimum value for current PID output.			
PA-09 FA09H	PID Deviation Limit	0.0 ~ 100.0%	0.0%	Real-Time Change
	No adjustment is needed when the deviation value is within the PID deviation limit.			
PA-10 FA0AH	PID Derivative Amplitude Limit	0.00 ~ 100.00%	0.10%	Real-Time Change
	Limit PID differential action within a small range to avoid system oscillation.			
PA-11 FA0BH	PID Reference Change Time	0.00 ~ 650.00s	0.00s	Real-Time Change
	Indicates the time required for the PID setpoint to change from 0.0% to 100.0%.			
PA-12 FA0CH	PID Feedback Filter Time	0.00 ~ 60.00s	0.00s	Real-Time Change
	Filtering helps reduce the impact of interference on the feedback quantity but may reduce the responsiveness of the closed-loop system process.			
PA-13 FA0DH	PID Output Filter Time	0.00 ~ 60.00s	0.00s	Real-Time Change
PA-15 FA0FH	Proportional Gain (Kp2)	00.0 ~ 1000.0	20.0	Real-Time Change
	Kp determines the speed at which the deviation decreases, the larger the Kp, the faster the deviation decreases.			
PA-16 FA10H	Integral Time (Ti2)	0.01 ~ 10.00s	2.00s	Real-Time Change
	Ti determines the strength of integral adjustment, the shorter the integral time, the stronger the adjustment.			
PA-17 FA11H	Derivative Time (Td2)	0.000 ~ 10.000s	0.000s	Real-Time Change

	Td determines the strength of the adjustment of the rate of change of deviation, the longer the differential time, the stronger the adjustment.			
PA-18 FA12H	PID Parameter Switch	0 ~ 3	0	Real-Time Change
	0: No Switch 1: Switch Via DI Terminal 2: Auto Switch Based on Deviation 3: Auto Switch Based on Running Frequency			
PA-19 FA13H	PID Parameter Switch Deviation 1	0.0 ~ PA-20 %	20.0%	Real-Time Change
	When this parameter value is set to 100%, it corresponds to the maximum deviation between the setpoint and feedback.			
PA-20 FA14H	PID Parameter Switch Deviation 2	PA-19 ~ 100.0%	80.0%	Real-Time Change
	When this parameter value is set to 100%, it corresponds to the maximum deviation between the setpoint and feedback.			
PA-21 FA15H	PID Initial Value	0.0 ~ 100.0%	0.0%	Real-Time Change
	At startup, the inverter outputs the initial PID value, and closed-loop adjustment calculations begin after PA-22.			
PA-22 FA16H	PID Initial Value Hold Time	0.00 ~ 650.00s	0.00s	Real-Time Change
	See description in PA-21.			
PA-23 FA17H	Maximum value of two consecutive output deviations.	0.0~100.00%	1.00%	Real-Time Change
PA-24 FA18H	Minimum value of two consecutive output deviations.	0.0~100.00%	1.00%	Real-Time Change
PA-25 FA19H	PID Integral Attributes	0~11	0	Real-Time Change
	Units: Integral Separation 0: Inactive; 1: Active Tens: Stop integrating after reaching limit value 0: Continue integrating; 1: Stop integrating			
PA-26 FA1AH	PID Feedback Loss Detection Value	0.0 ~ 100.0%	0.0%	Real-Time Change

	Used to determine if PID feedback is lost; a fault is reported if the feedback quantity is below PA-26 and continues for PA-27; if this parameter is 0, feedback loss is not determined.			
PA-27 FA1BH	PID Feedback Loss Detection Time	0.0 ~ 20.0s	0.0s	Real-Time Change
	See description in PA-26.			
PA-28 FA1CH	PID Calculation During Stop	0 ~ 1	0	Real-Time Change
	0: No Calculation During Stop 1: Calculation During Stop			

PB - Swing Frequency, Length, and Count

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
PB-00 FB05H	Swing Frequency Setting Method	0~1	0	Real-Time Change
	0: Relative to Center Frequency (Set Frequency) 1: Relative to Maximum Frequency			
PB-01 FB06H	Swing Frequency Amplitude	0.0~100.0%	0.0%	Real-Time Change
	PB-00=0: When relative to center frequency, 100% corresponds to set frequency. PB-00=1: When relative to maximum frequency, 100% corresponds to maximum frequency.			
PB-02 FB07H	Jump Frequency Amplitude	0.0~50.0%	0.0%	Real-Time Change
PB-03 FB08H	Swing Frequency Period	0.1~3000.0s	10.0s	Real-Time Change
PB-04 FB09H	Triangle Wave Rising Time of Swing Frequency	0.1~100.0%	50.0%	Real-Time Change
	Percentage of triangle wave rising time relative to swing frequency period PB-03 Triangle Wave Rising Time = Swing Frequency Period PB-03 × Triangle Wave Rising Time PB-04 Triangle Wave Falling Time = Swing Frequency Period PB-03 × (1 - Triangle Wave Rising Time PB-04)			

PC - Multi-Segment Commands

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
PC-00 FC00H	Multi-Segment Command 0	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-01 FC01H	Multi-Segment Command 1	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-02 FC02H	Multi-Segment Command 2	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-03 FC03H	Multi-Segment Command 3	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-04 FC04H	Multi-Segment Command 4	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-05 FC05H	Multi-Segment Command 5	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-06 FC06H	Multi-Segment Command 6	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-07 FC07H	Multi-Segment Command 7	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-08 FC0H	Multi-Segment Command 8	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-09 FC09H	Multi-Segment Command 9	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-10 FC0AH	Multi-Segment Command 10	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-11 FC0BH	Multi-Segment Command 11	-100.0 ~ 100.0%	0.0%	Real-Time Change

PC-12 FC0CH	Multi-Segment Command 12	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-13 FC0DH	Multi-Segment Command 13	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-14 FC0EH	Multi-Segment Command 14	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-15 FC0FH	Multi-Segment Command 15	-100.0 ~ 100.0%	0.0%	Real-Time Change
PC-16 FC10H	Simple PLC Running Mode 0: Stop After One Cycle 1: Hold Final Value After One Cycle 2: Start Another Cycle	0 ~ 2	0	Real-Time Change
PC-17 FC11H	Simple PLC Power-Off Memory Selection Ones: Power-Off Memory Selection 0: No Power-Off Memory 1: Power-Off Memory Tens: Shutdown Memory Selection 0: No Shutdown Memory 1: Shutdown Memory	00 ~ 11	00	Real-Time Change
PC-18 FC12H	PLC Segment 0 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-19 FC13H	PLC Segment 0 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-20 FC14H	PLC Segment 1 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-21 FC15H	PLC Segment 1 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change

PC-22 FC16H	PLC Segment 2 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-23 FC17H	PLC Segment 2 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-24 FC18H	PLC Segment 3 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-25 FC19H	PLC Segment 3 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-26 FC1AH	PLC Segment 4 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-27 FC1BH	PLC Segment 4 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-28 FC1CH	PLC Segment 5 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-29 FC1DH	PLC Segment 5 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-30 FC1EH	PLC Segment 6 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-31 FC1FH	PLC Segment 6 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-32 FC20H	PLC Segment 7 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change

PC-33 FC21H	PLC Segment 7 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-34 FC22H	PLC Segment 8 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-35 FC23H	PLC Segment 8 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-36 FC24H	PLC Segment 9 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-37 FC25H	PLC Segment 9 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-38 FC26H	PLC Segment 10 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-39 FC27H	PLC Segment 10 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-40 FC28H	PLC Segment 11 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-41 FC29H	PLC Segment 11 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-42 FC2AH	PLC Segment 12 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-43 FC2BH	PLC Segment 12 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change

PC-44 FC2CH	PLC 13 Segment Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-45 FC2DH	PLC Segment 13 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-46 FC2EH	PLC Segment 14 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-47 FC2FH	PLC Segment 14 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-48 FC30H	PLC Segment 15 Running Time	0.0 ~ 6500.0s(h)	0.0s(h)	Real-Time Change
PC-49 FC31H	PLC Segment 15 Acceleration/Deceleration Time Selection	0 ~ 3	0	Real-Time Change
PC-50 FC32H	Units for PLC Running Time 0: Second (s) 1: Hour (h)	0 ~ 1	0	Real-Time Change
PC-51 FC33H	Reference Method for Multi-Segment Command 0 0: Function Code (PC-00) Reference 1: AI1 2: AI2 3: AI3 4: PULSE 5: PID 6: Preset Frequency (P0-08)	0 ~ 6	0	Real-Time Change

PD - Communication Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
PD-00 FD00H	Baud Rate	0002 ~ 6009	5005	Real-Time Change
	Ones: MODBUS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Tens: Reserved Hundreds: Reserved Thousands: CANlink Baud Rate 0: 20 1: 50 2: 100 3: 125 4: 250 5: 500 6: 1M			
PD-01 FD01H	MODBUS Data Format	0 ~ 3	0	Real-Time Change
	0: No Check (8-N-2) 1: Even Parity Check (8-E-1 2: Odd Parity Check (8-O-1) 3: No Check (8-N-1)			
PD-02 FD02H	Local Address	1 ~ 247	1	Real-Time Change
PD-03 FD03H	MODBUS Response Delay	0 ~ 20ms	2ms	Real-Time Change
PD-04 FD04H	Communication Timeout	0.0 ~ 60.0s	0.0s	Real-Time Change

PD-05 FD05H	Data Transmission Format Selection Ones: MODBUS 0: Non-standard MODBUS Protocol 1: Standard MODBUS Protocol Tens: Profibus-DP 0: PPO1 Format 1: PPO2 Format 2: PPO3 Format 3: PPO4 Format	00 ~ 31	31	Real-Time Change
PD-06 FD06H	Communication Read Current Resolution 0: 0.01A 1: 0.1A	0 ~ 1	0	Real-Time Change
PD-08 FD08H	Expansion Card Communication Timeout	0.0 ~ 60.0s	0.0s	Real-Time Change

PF - Factory Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
PF-00 FF00H	Factory Password	0 ~ 65535	0	Real-Time Change
PF-01 FF01H	AC Drive Model	1 ~ 537	11	Shutdown Change
PF-02 FF02H	AC Drive Type 1: Heavy Load 2: Light Load	1 ~ 2	1	Shutdown Change
PF-03 FF03H	AC Drive Power	0.0 ~ 6553.5kW	3.7kW	Unchangeable
PF-04 FF04H	Temperature Curve	1 ~ 4	1	Shutdown Change
PF-05 FF05H	UV Two-Phase Current Sampling Gain Deviation	90.0 ~ 110.0%	100%	Shutdown Change
PF-08 FF08H	Voltage Correction Factor	85.0 ~ 140.0%	100%	Real-Time Change
PF-09 FF09H	Current Correction Factor	85.0 ~ 115.0%	100%	Real-Time Change
PF-10 FF0AH	Number of Displayed Performance Tuning Function Codes	0 ~ 3030	0	Real-Time Change
PF-11 FF0BH	AIAO Correction Function Code Display	000 ~ 111H	000H	Shutdown Change
PF-12 FF0CH	View Memory Address	0000 ~ 3FFFH	0000H	Real-Time Change

PP - Function Code Management

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
PP-00 1F00H	User Password	0 ~ 65535	0	Real-Time Change
PP-01 1F01H	Parameter Initialization 0: No Action 1: Restore Factory Parameters (excluding motor parameters) 2: Clear Log Information 4: Backup Current User Parameters 501: Restore User Backup Parameters	0~2	0	Shutdown Change
PP-02 1F02H	Display of Function Parameter Groups Selection Units: U Group Display Selection 0: Do Not Display; 1: Display Tens: A Group Display Selection 0: Do Not Display; 1: Display Hundreds: B Group Display Selection 0: Do Not Display; 1: Display Thousands: C Group Display Selection 0: Do Not Display; 1: Display	0 ~ 1111	0011	Shutdown Change
PP-03 1F03H	Display of Preference Parameter Groups Selection	0 ~ 11	0	Real-Time Change
PP-04 1F04H	Parameter Modification Attribute 0: Function Code Parameters Can Be Modified 1: Function Code Parameters Cannot Be Modified	0 ~ 1	0	Real-Time Change

A0 - Torque Control Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
A0-00 A000H	Speed/Torque Control Mode Selection 0: Speed Control 1: Torque Control	0 ~ 1	0	Stop Change
A0-01 A001H	Torque Setting Selection (Torque Control Mode) 0: Digital Setting (A0-03) 1: AI1 2: AI2 3: AI3 4: PULSE 5: Communication Reference 6: MIN (AI1, AI2) 7: MAX (AI1, AI2)	0 ~ 7	0	Stop Change
A0-03 A003H	Digital Torque Setting (Torque Control Mode)	-200.0 ~ 200.0%	150.0%	Real-Time Change
A0-05 A005H	Maximum Forward Frequency (Torque Control Mode)	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
A0-06 A006H	Maximum Reverse Frequency (Torque Control Mode)	0.00 ~ P0-10Hz	50.00Hz	Real-Time Change
A0-07 A007H	Torque Boost Filter Time	0.00 ~ 650.00s	0.00s	Real-Time Change
A0-08 A008H	Torque Drop Filter Time	0.00 ~ 650.00s	0.00s	Real-Time Change

A2 - Second Motor Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
A2-00 A200H	Motor Type Selection	0～2	0	Shutdown Change
	0: Standard Asynchronous Motor 1: Variable Frequency Asynchronous Motor 2: Permanent Magnet Synchronous Motor 3: Reluctance Synchronous Motor			
A2-01 A201H	Motor Rated Power	0.1 ~ 1000.0kW	Model-Based	Shutdown Change
A2-02 A202H	Motor Rated Voltage	1 ~ 2000V	Model-Based	Shutdown Change
A2-03 A203H	Motor Rated Current	0.01 ~ 655.35A	Model-Based	Shutdown Change
A2-04 A204H	Motor Rated Frequency	0.01 ~ P0-10Hz	Model-Based	Shutdown Change
A2-05 A205H	Motor Rated Speed	1 ~ 65535rpm	Model-Based	Shutdown Change
A2-06 A206H	Asynchronous Motor Stator Resistance	0.001 ~ 65.535Ω	Model-Based	Shutdown Change
A2-07 A207H	Asynchronous Motor Rotor Resistance	0.001 ~ 65.535Ω	Model-Based	Shutdown Change
A2-08 A208H	Asynchronous Motor Leakage Reactance	0.01 ~ 655.35mH	Model-Based	Shutdown Change
A2-09 A209H	Asynchronous Motor Mutual Reactance	0.01 ~ 655.35mH	Model-Based	Shutdown Change
A2-10 A20AH	Asynchronous Motor No-load Current	0.1~A2-03 A	Model-Based	Shutdown Change

A2-16 A210H	Synchronous Motor Stator Resistance	0.001 ~ 65.535Ω	Model-Based	Shutdown Change
A2-17 A211H	Synchronous Motor D-Axis Inductance	0.01 ~ 655.35mH	Model-Based	Shutdown Change
A2-18 A212H	Synchronous Motor Q-Axis Inductance	0.01 ~ 655.35mH	Model-Based	Shutdown Change
A2-20 A214H	Synchronous Motor Back EMF	0.0 ~ 6553.5V	Model-Based	Shutdown Change
A2-27 A21BH	Encoder Lines	1 ~ 65535	Model-Based	Shutdown Change
A2-28 A21CH	Encoder Type 0: ABZ Incremental Encoder 1: ABZ Differential Encoder with UVW Signals 2: Resolver Encoder 3: ABZ Differential Encoder with Sine/Cosine Signals 4: UVW Encoder with Cable Saving Mode	0 ~ 4	Model-Based	Shutdown Change
A2-29 A21DH	Speed Feedback PG Selection 0: Primary PG Card 1: Auxiliary PG Card	0 ~ 1	Model-Based	Shutdown Change
A2-30 A21EH	Encoder AB Phase Sequence 0: Forward 1: Reverse	0 ~ 1	Model-Based	Shutdown Change
A2-31 A21FH	Encoder Installation Angle	0.0 ~ 359.9°	Model-Based	Shutdown Change
A2-32 A220H	UVW Signal Direction	0 ~ 65535	Model-Based	Shutdown Change
A2-33 A221H	UVW Signal Zero Position Angle	0.0 ~ 6553.5	Model-Based	Shutdown Change

A2-34 A222H	Resolver Pole Pairs	1 ~ 65535	Model-Based	Shutdown Change
A2-36 A224H	Speed Feedback PG Break Detection Time	0.0 ~ 10.0s	Model-Based	Shutdown Change
A2-37 A225H	Tuning Selection 0: No Action 1: Asynchronous Motor Static Partial Tuning 2: Asynchronous Motor Dynamic Tuning 3: Asynchronous Motor Static Complete Tuning 11: Synchronous On-Load Tuning 12: Synchronous No-Load Tuning	0 ~ 12	0	Shutdown Change
A2-38 A226H	Speed Loop Proportional Gain 1	1~100	30	Real-Time Change
A2-39 A227H	Speed Loop Integral Time 1	0.01~10.00s	0.50s	Real-Time Change
A2-40 A228H	Switching Frequency 1	0.00~A2-43 Hz	5.00Hz	Real-Time Change
A2-41 A229H	Speed Loop Proportional Gain 2	1~100	20	Real-Time Change
A2-42 A22AH	Speed Loop Integral Time 2	0.01~10.00s	1.00s	Real-Time Change
A2-43 A22BH	Switching Frequency 2	A2-40~P0-10 Hz	10.00Hz	Real-Time Change
A2-44 A22CH	Vector Control Slip Gain	50~200%	100%	Real-Time Change
A2-45 A22DH	SVC Speed Feedback Filter Time	0.000~0.100s	0.015s	Real-Time Change

A2-46 A22EH	Vector Control Over-Excitation Gain	0~200	64	Real-Time Change
A2-47 A22FH	Speed Control (Drive) Torque Limit Source 0: Upper Limit Digital Setting (A2-48) 1: AI1; 2: AI2; 3: AI3 4: PULSE Pulse Setting (DI5); 5: Communication Given 6: MIN(AI1, AI2); 7: MAX(AI1, AI2)	0~7	0	Real-Time Change
A2-48 A230H	Speed Control (Drive) Torque Upper Limit Digital Setting	0.0~200.0%	150.0%	Real-Time Change
A2-49 A231H	Speed Control (Braking) Torque Limit Source 0: Upper Limit Digital Setting (A2-48) 1: AI1; 2: AI2; 3: AI3 4: PULSE Pulse Setting (DI5); 5: Communication Given 6: MIN(AI1, AI2); 7: MAX(AI1, AI2) 8: Upper Limit Digital Setting (A2-50)	0~8	0	Real-Time Change
A2-50 A232H	Speed Control (Braking) Torque Upper Limit Digital Setting	0.0~200.0%	150.0%	Real-Time Change
A2-51 A233H	Excitation Adjustment Proportional Gain	0~60000	2000	Real-Time Change
A2-52 A234H	Excitation Adjustment Integral Gain	0~60000	1300	Real-Time Change
A2-53 A235H	Torque Adjustment Proportional Gain	0~60000	2000	Real-Time Change
A2-54 A236H	Torque Adjustment Integral Gain	0~60000	1300	Real-Time Change
A2-55 A237H	Speed Loop Integral Attributes 0: Integral Separation Inactive 1: Integral Separation Active	0~1	0	Real-Time Change
A2-72	Initial Position Detection	0~2	0	Real-Time

A248H				Change
	0: Detect at Each Startup 1: Do Not Detect 2: Detect on First Power Up After Startup Initial position angle detection is generally used in SVC. Its advantage is that there is no reverse rotation at startup, and the disadvantage is that there is some noise at startup. For situations where reverse rotation is not allowed at startup and the rotor position of the motor changes after stopping, it must be set to 0, in other cases it can be set to 1 or 2. FVC only detects in the case of an ABZ encoder and on the first power-up, and it is recommended not to change this setting to avoid the risk of runaway.			
A2-73 A249H	Speed Loop Mode Selection	0~1	0	Real-Time Change
A2-74 A24AH	Maximum Output Adjustment Coefficient	50~500	100	Real-Time Change
A2-75 A24BH	Bus Voltage Frequency Limit Enable Based on	0~1	0	Real-Time Change
A2-76 A24CH	Feedforward Compensation Mode	0~2	0	Real-Time Change
	0: No Compensation 1: Add Back Electromotive Force Feedforward Compensation 2: Add Voltage Feedforward Compensation Only valid in FVC mode.			
A2-77 A24DH	Current Loop Tuning KP	1~100	6	Real-Time Change
A2-78 A24EH	Current Loop Tuning KI	1~100	6	Real-Time Change
A2-79 A24FH	Z-Signal Correction Enable	0~1	1	Real-Time Change
A2-80 A250H	Synchronous Motor SVC Speed Filtering Level	10~1000	100	Real-Time Change
A2-81 A251H	Synchronous Motor SVC Speed Estimation Proportional Gain	5~200	40	Real-Time Change

A2-82 A252H	Synchronous Motor SVC Speed Estimation Integral Gain	5~500	30	Real-Time Change
A2-83 A253H	Synchronous Motor SVC Initial Excitation Current Limit	0~80	30	Real-Time Change
A2-84 A254H	Synchronous Motor SVC Minimum Carrier Frequency	0.8~P0-15 kHz	1.5kHz	Real-Time Change
A2-85 A255H	Low Frequency Operation Mode	0~1	0	Real-Time Change
A2-86 A256H	Low Frequency Step Size	0.0005~1.0000	0.0010	Real-Time Change
A2-87 A257H	Low Frequency Braking Current	0~120	50	Real-Time Change
A2-88 A258H	Synchronous Motor SVC Speed Tracking	0~1	0	Real-Time Change
A2-89 A259H	Zero Servo Enable	0~1	0	Real-Time Change
A2-90 A25AH	Switching Frequency	0.00~A2-40 Hz	0.30Hz	Real-Time Change
A2-91 A25BH	Zero Servo Speed Loop Proportional Gain	1~100	10	Real-Time Change
A2-92 A25CH	Zero Servo Speed Loop Integral Time	0.01~10.00	0.50	Real-Time Change
A2-93 A25DH	Stop Inhibition of Reversal	0~1	0	Real-Time Change

A2-94 A25EH	Online Tuning Enable 0: Off 1: Tune before first operation upon power up 2: Tune before running	0~2	0	Real-Time Change
A2-95 A25FH	Online Back EMF Identification 0: Off 1: On	0~1	0	Real-Time Change
A2-96 A260H	Initial Position Compensation Angle	0.0~359.9°	0.0°	Real-Time Change

A5 - Control Optimization Parameters

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
A5-00 A500H	DPWM Switching Upper Limit Frequency	5.00 ~ P0-10Hz	8.00Hz	Real-Time Change
A5-01 A501H	PWM Modulation Mode 0: Asynchronous Modulation 1: Synchronous Modulation	0 ~ 1	0	Real-Time Change
A5-02 A502H	Dead Time Compensation Mode Selection 0: No Compensation 1: Compensation Mode 1	0 ~ 1	0	Real-Time Change
A5-03 A503H	Random PWM Depth	0 ~ 10	0	Real-Time Change
A5-04 A504H	Cycle-by-Cycle Current Limit 0: Disabled 1: Enabled	0 ~ 1	0	Real-Time Change
A5-05 A505H	Overmodulation Factor	100 ~ 110%	105%	Shutdown Change
A5-06 A506H	Undervoltage Point Setting	200.0~2000.0V	Model Determination	Real-Time Change
A5-08 A508H	Dead Time Adjustment	100 ~ 200%	150%	Shutdown Change
A5-09 A509H	Overvoltage Point Setting	200.0~2200.0V	Model Determination	Shutdown Change

A6 - AI Curve Settings

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
A6-00 A600H	AI Curve 4 Minimum Input	-10.00 ~ A6-02 V	0.00V	Real-Time Change
A6-01 A601H	AI Curve 4 Minimum Input Setting	-100.0 ~ 100.0%	0.0%	Real-Time Change
A6-02 A602H	AI Curve 4 Inflection Point 1 Input	A6-00 ~ A6-04 V	3.00V	Real-Time Change
A6-03 A603H	AI Curve 4 Inflection Point 1 Input Setting	-100.0 ~ 100.0%	30.0%	Real-Time Change
A6-04 A604H	AI Curve 4 Inflection Point 2 Input	A6-02 ~ A6-06 V	6.00V	Real-Time Change
A6-05 A605H	AI Curve 4 Inflection Point 2 Input Setting	-100.0 ~ 100.0%	60.0%	Real-Time Change
A6-06 A606H	AI Curve 4 Maximum Input	A6-04 ~ 10.00 V	10.00V	Real-Time Change
A6-07 A607H	AI Curve 4 Maximum Input Setting	-100.0 ~ 100.0%	100.0%	Real-Time Change
A6-08 A608H	AI Curve 5 Minimum Input	-10.00 ~ A6-10 V	-10.00V	Real-Time Change
A6-09 A609H	AI Curve 5 Minimum Input Setting	-100.0 ~ 100.0%	-100.0%	Real-Time Change
A6-10 A60AH	AI Curve 5 Inflection Point 1 Input	A6-08 ~ A6-12 V	-3.00V	Real-Time Change
A6-11 A60BH	AI Curve 5 Inflection Point 1 Input Setting	-100.0 ~ 100.0%	-30.0%	Real-Time Change

A6-12 A60CH	AI Curve 5 Inflection Point 2 Input	A6-10 ~ A6-14 V	3.00V	Real-Time Change
A6-13 A60DH	AI Curve 5 Inflection Point 2 Input Setting	-100.0 ~ 100.0%	30.0%	Real-Time Change
A6-14 A60EH	AI Curve 5 Maximum Input	A6-12 ~ 10.00 V	10.00V	Real-Time Change
A6-15 A60FH	AI Curve 5 Maximum Input Setting	-100.0 ~ 100.0%	100.0%	Real-Time Change
A6-24 A618H	AI1 Set Hopping Point	-100.0 ~ 100.0%	0.0%	Real-Time Change
A6-25 A619H	AI1 Set Hopping Amplitude	0.0 ~ 100.0%	0.1%	Real-Time Change
A6-26 A61AH	AI2 Set Hopping Point	-100.0 ~ 100.0%	0.0%	Real-Time Change
A6-27 A61BH	AI2 Set Hopping Amplitude	0.0 ~ 100.0%	0.1%	Real-Time Change
A6-28 A61CH	AI3 Set Hopping Point	-100.0 ~ 100.0%	0.0%	Real-Time Change
A6-29 A61DH	AI3 Set Hopping Amplitude	0.0 ~ 100.0%	0.1%	Real-Time Change

AC - AIAO Correction

Function Code	Item/Description	Adjustment Range	Factory Setting	Change Mode
AC-00 AC00H	AI1 Measured Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-01 AC01H	AI1 Displayed Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-02 AC02H	AI1 Measured Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-03 AC03H	AI1 Displayed Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-04 AC04H	AI2 Measured Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-05 AC05H	AI2 Displayed Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-06 AC06H	AI2 Measured Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-07 AC07H	AI2 Displayed Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-08 AC08H	AI3 Measured Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-09 AC09H	AI3 Displayed Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-10 AC0AH	AI3 Measured Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-11 AC0BH	AI3 Displayed Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change

AC-12 AC0CH	AO1 Measured Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-13 AC0DH	AO1 Displayed Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-14 AC0EH	AO1 Measured Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-15 AC0FH	AO1 Displayed Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-16 AC10H	AO2 Measured Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-17 AC11H	AO2 Displayed Voltage 1	-10.000 ~ 10.000V	2.000V	Real-Time Change
AC-18 AC12H	AO2 Measured Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change
AC-19 AC13H	AO2 Displayed Voltage 2	-10.000 ~ 10.000V	8.000V	Real-Time Change

U0 - Monitoring Parameters

Function Code	Item/Description (Read-Only)
U0-00 7000H	Running Frequency Minimum Unit: 0.01Hz
U0-01 7001H	Set Frequency Minimum Unit: 0.01Hz
U0-02 7002H	Bus Voltage Minimum Unit: 0.1V
U0-03 7003H	Output Voltage Minimum Unit: 1V
U0-04 7004H	Output Current Minimum Unit: 0.01A
U0-05 7005H	Output Power Minimum Unit: 0.1kW
U0-06 7006H	Output Torque Minimum Unit: 0.10%
U0-07 7007H	DI Input Status Minimum Unit: 1
U0-08 7008H	DO Output Status Minimum Unit: 1
U0-09 7009H	AI1 Voltage Minimum Unit: 0.01V
U0-10 700AH	AI2 Voltage Minimum Unit: 0.01V
U0-11 700BH	AI3 Voltage Minimum Unit: 0.01V
U0-12 700CH	Counter Value Minimum Unit: 1
U0-13 700DH	Length Value Minimum Unit: 1
U0-14 700EH	Load Speed Display Minimum Unit: 1rpm
U0-15 700FH	PID Setting Minimum Unit: 1
U0-16 7010H	PID Feedback Minimum Unit: 1

U0-17 7011H	PLC Phase Minimum Unit: 1
U0-18 7012H	PULSE Input Frequency Minimum Unit: 0.01kHz
U0-19 7013H	Feedback Speed Minimum Unit: 0.01Hz
U0-20 7014H	Remaining Running Time Minimum Unit: 0.1min
U0-21 7015H	AI1 Voltage Before Correction Minimum Unit: 0.001V
U0-22 7016H	AI2 Voltage Before Correction Minimum Unit: 0.001V
U0-23 7017H	AI3 Voltage Before Correction Minimum Unit: 0.001V
U0-24 7018H	Motor Speed Minimum Unit: 1rpm
U0-25 7019H	Current Power-On Time Minimum Unit: 1min
U0-26 701AH	Current Running Time Minimum Unit: 0.1min
U0-27 701BH	PULSE Input Frequency Minimum Unit: 1Hz
U0-28 701CH	Communication Setting Value Minimum Unit: 0.01%
U0-29 701DH	Encoder Feedback Speed Minimum Unit: 0.01Hz
U0-30 701EH	Primary Frequency X Display Minimum Unit: 0.01Hz
U0-31 701FH	Auxiliary Frequency X Display Minimum Unit: 0.01Hz
U0-32 7020H	View Arbitrary Memory Address Minimum Unit: 1
U0-33 7021H	Synchronous Motor Rotor Position Minimum Unit: 1°
U0-34 7022H	Motor Temperature Minimum Unit: 0.10℃
U0-35 7023H	Target Torque Minimum Unit: 1%
U0-36	Resolver Position

7024H	Minimum Unit: 1
U0-37 7025H	Power Factor Angle Minimum Unit: 0.1°
U0-38 7026H	ABZ Position Minimum Unit: 1
U0-39 7027H	V/F Separation Target Voltage Minimum Unit: 1V
U0-40 7028H	V/F Separation Output Voltage Minimum Unit: 1V
U0-45 702DH	Fault Information Minimum Unit: 1
U0-58 703AH	Motor Revolutions Minimum Unit: 1
U0-59 703BH	Set Frequency Minimum Unit: 0.01%
U0-60 703CH	Running Frequency Minimum Unit: 0.01%
U0-61 703DH	AC Drive Status Minimum Unit: 1
U0-62 703EH	Current Fault Code Minimum Unit: 1
U0-63 703FH	Point-to-Point Communication Transmitted Torque Value Minimum Unit: 0.1
U0-64 7040H	Number of Slaves in Master-Slave Control Minimum Unit: 1
U0-65 7041H	Torque Upper Limit Minimum Unit: 0.1%
U0-66 7042H	Reserved Minimum Unit: 1
U0-67 7043H	Reserved Minimum Unit: 1
U0-68 7044H	DP Card AC Drive Status Minimum Unit: 1
U0-69 7045H	DP Card Speed Minimum Unit: 0.01Hz
U0-70 7046H	DP Card RPM Minimum Unit: 1rpm
U0-71 7047H	Communication Card Dedicated Current Display Minimum Unit: 0.1A

U0-72 7048H	Reserved Minimum Unit: 1
U0-73 7049H	Motor Serial Number Minimum Unit: 1
U0-74 704AH	AC Drive Output Torque Minimum Unit: 0.10%
U0-75 704BH	Inverter Module Heat Sink Temperature Minimum Unit: 0℃
U0-78 704EH	Line Speed Minimum Unit: m/min
U1-00 7100H	Product Version
U1-01 7101H	Performance Software Version
U1-02 7102H	Function Software Version
U1-03 7103H	Performance Software Temporary Version
U1-04 7104H	Function Software Temporary Version
U1-05 7105H	LED Keyboard Software Version

9. Faults - Causes - Solutions

Fault Code	Fault Name	Possible Cause	Solution
ERR01	IGBT Fault	Short Circuit in AC Drive Output Circuit	Check the cable connections between the AC drive and the motor, as well as the insulation condition of the motor.
		Motor-to-AC Drive Cable Too Long	Verify if the motor cable length exceeds the specified limit, and install an output reactor/filter if necessary.
		Module Overheat	Check if the AC drive fan is working properly and if the air passage is blocked.
		Hardware Failure	Seek technical support.
ERR02	Overcurrent During Acceleration	Grounding or Short Circuit in AC Drive Output Circuit	Inspect the motor or contactor for any short circuit.
		FVC or SVC Control Mode Without Parameter Tuning	Set the motor parameters according to the nameplate and perform motor parameter tuning.
		Short Acceleration Time for High-Speed Conditions	Increase the acceleration time (P0-17).
		Inappropriate Overcurrent Stall Suppression Setting	Verify that the overcurrent stall suppression function (P3-19) is enabled; Lower the overcurrent stall action current (P3-18), if set too high, to a recommended value between 120% and 150%; Increase the overcurrent stall suppression gain (P3-20), if set too low, to a recommended value between 20 and 40.
		Inappropriate Manual Torque Boost or V/F Curve	Adjust the manual torque boost or V/F curve.
		No Brake Unit and Brake Resistor	Install a brake unit and a brake resistor.
		External Interference	Check historical fault records to see if the current value reached overcurrent

			(P3-18) at the time of fault. If not, investigate external interference sources and eliminate them. If no external interference is found, contact the manufacturer for possible damage to the drive board or Hall devices.
ERR03	Overcurrent During Deceleration	Grounding or Short Circuit in AC Drive Output Circuit	Inspect the motor for any short circuit or open circuit.
		FVC or SVC Control Mode Without Parameter Tuning	Set the motor parameters according to the nameplate and perform motor parameter tuning.
		Short Deceleration Time for High-Speed Conditions	Increase the deceleration time (P0-18).
		Inappropriate Overcurrent Stall Suppression Setting	Verify that the overcurrent stall suppression function (P3-19) is enabled; Lower the overcurrent stall action current (P3-18), if set too high, to a recommended value between 120% and 150%; Increase the overcurrent stall suppression gain (P3-20), if set too low, to a recommended value between 20 and 40.
		No Brake Unit and Brake Resistor	Install a brake unit and a brake resistor.
		External Interference	Check historical fault records to see if the current value reached overcurrent (P3-18) at the time of fault. If not, investigate external interference sources and eliminate them. If no external interference is found, contact the manufacturer for possible damage to the drive board or Hall devices.
ERR04	Overcurrent at Constant Speed	Grounding or Short Circuit in AC Drive Output Circuit	Inspect the motor for any short circuit or open circuit.
		FVC or SVC Control Mode Without Parameter Tuning	Set the motor parameters according to the nameplate and perform motor parameter tuning.
		Inappropriate Overcurrent Stall Suppression Setting	Verify that the overcurrent stall suppression function (P3-19) is

			enabled; Lower the overcurrent stall action current (P3-18), if set too high, to a recommended value between 120% and 150%; Increase the overcurrent stall suppression gain (P3-20), if set too low, to a recommended value between 20 and 40.
		Insufficient AC Drive Capacity	If the running current exceeds the motor's rated current or the AC drive's rated output current during stable operation, choose an AC drive with a higher power rating.
		External Interference	Check historical fault records to see if the current value reached overcurrent (P3-18) at the time of fault. If not, investigate external interference sources and eliminate them. If no external interference is found, contact the manufacturer for possible damage to the drive board or Hall devices.
ERR05	Overvoltage During Acceleration	High Input Grid Voltage	Adjust the voltage to the normal range.
		External Force Dragging Motor During Acceleration	Eliminate the external force or install a brake resistor.
		Inappropriate Overvoltage Suppression Setting	Verify that the overvoltage suppression function (P3-23) is enabled; Lower the overvoltage suppression action voltage (P3-22), if set too high, to a recommended value between 700V and 770V; Increase the overvoltage suppression gain (P3-24), if set too low, to a recommended value between 30 and 50.
		No Brake Unit and Brake Resistor	Install a brake unit and a brake resistor.
		Acceleration Time Too Short	Increase the acceleration time (P0-17).
ERR06	Overvoltage During Deceleration	Inappropriate Overvoltage Suppression Setting	Verify that the overvoltage suppression function (P3-23) is enabled; Lower the overvoltage suppression action voltage

			(P3-22), if set too high, to a recommended value between 700V and 770V; Increase the overvoltage suppression gain (P3-24), if set too low, to a recommended value between 30 and 50.
		External Force Dragging Motor During Acceleration	Eliminate the external force or install a brake resistor.
		Deceleration Time Too Short	Increase the deceleration time (P0-18).
		No Brake Unit and Brake Resistor	Install a brake unit and a brake resistor.
ERR07	Overvoltage at Constant Speed	Inappropriate Overvoltage Suppression Setting	Verify that the overvoltage suppression function (P3-23) is enabled; Lower the overvoltage suppression action voltage (P3-22), if set too high, to a recommended value between 700V and 770V; Increase the overvoltage suppression gain (P3-24), if set too low, to a recommended value between 30 and 50.
		External Force Dragging Motor During Acceleration	Eliminate the external force or install a brake resistor.
ERR08	Undervoltage Fault	Momentary Power Failure	Enable the momentary power failure ride-through function (P9-59) to prevent undervoltage faults due to instantaneous power failures.
		Input Voltage Out of Specified Range	Adjust the input voltage to the normal range.
		Abnormal Bus Voltage	Seek technical support.
		Rectifier, Inverter Drive Board, or Inverter Control Board Failure	Seek technical support.
ERR09	AC Drive Overload	P1-10 No-load Current Parameter	Correctly set the parameter.
		Excessive Load or Motor Stalling	Reduce the load and check the motor and mechanical conditions.
ERR10	Module	High Ambient	Reduce the ambient temperature.

	Overheat	Temperature	
		Blocked Air Duct	Clean the air duct.
		Damaged Fan	Replace the fan.
		Damaged Thermistor	Seek technical support.
		Damaged Module	Seek technical support.
ERR12	Input Phase Loss	Three-Phase Input Power Failure	Check the input RST wiring and three-phase input voltage for normalcy.
		Drive Board, Lightning Protection Board, Main Control Board, or Rectifier Bridge Failure	Seek technical support.
ERR13	Output Phase Loss	Motor Failure	Check if the motor is open-circuited.
		AC Drive-to-Motor Wiring Failure	Troubleshoot external faults.
		Unbalanced Three-Phase Output From AC Drive During Motor Running	Check the motor's three-phase windings for normalcy and troubleshoot accordingly.
		Drive Board or IGBT Module Failure	Seek technical support.
ERR17	Current Detection Fault	AC Drive Current Sampling Failure	Check if the main circuit is energized.
		AC Drive Current Sampling Failure	If the Hall sensor or current sampling circuit is damaged, contact the manufacturer.
ERR18	Pre-Charge Fault	Drive Board or Power Supply Failure	Replace the drive board or power supply board.
		Contactor Failure	Replace the contactor.
		Lightning Protection Board Failure	Replace the lightning protection board.
ERR19	EEPROM Read/Write Fault	Damaged EEPROM Chip	Seek services from the manufacturer.
ERR20	Encoder Fault	Mismatched Encoder Model	Set the parameter according to the actual encoder type.
		Incorrect Encoder Wiring	Check the PG card power supply and phase sequence.
		Damaged Encoder	Replace the encoder.
		PG Card Failure	Replace the PG card.
ERR23	Parameter	Motor Parameters Not Set	Set the motor parameters correctly

	Self-Tuning Fault	According to the Nameplate	based on the nameplate.
		Parameter Identification Timeout	Check the wiring from the AC drive to the motor.
ERR30	Motor Overload	Inappropriate P9-01 (Motor Protection) Setting	Correctly set P9-01 (increasing P9-01 can extend the time until motor overload).
		Excessive Load or Motor Stalling	Reduce the load and check the motor and mechanical conditions.
ERR31	Motor Overheat	Disconnected Temperature Sensor	Check the temperature sensor wiring and troubleshoot accordingly.
		Motor Temperature Too High	Increase the carrier frequency or adopt other cooling measures for the motor.
		P9-57 (Motor Overheat Protection Threshold) Set Too Low	Increase P9-57 (typically set at 90 ~ 100°C for standard motors).
ERR32	Ground Short Circuit Fault	Motor Ground Short Circuit	Replace and check the cable or motor; Check for ground short circuit fault
ERR33	Charging Resistor Overload	Input Voltage Out of Specified Range, Causing Repeated Pulling In and Off of Contactor	Check for large fluctuations in input grid voltage; Adjust voltage to within a specified range to prevent bus voltage from fluctuating around the contactor's operating point.
ERR34	External Device Fault	External Fault Inputted Via DI Terminal	Troubleshoot external faults, confirm mechanical readiness for restart (P8-18), and reset operation.
		External Fault Inputted Via Virtual IO Function	Ensure correct virtual IO configuration in A1 Group, and reset operation.
ERR36	Data Exchange Fault	Hardware Fault	Seek Technical Support
ERR37	Cumulative Running Time Reached	Cumulative Running Time Reached Set Limit	Use the parameter initialization function to clear log information.
ERR38	Cumulative Power-On Time Reached	Cumulative Power-On Time Reached Set Limit	Use the parameter initialization function to clear log information.
ERR39	Underload	AC Drive Running Current Below P9-64 Setting	Verify if the load is disconnected or if Parameters P9-64 and P9-65 align with actual running conditions.
ERR40	Communication	Upper Computer Failure	Inspect upper computer wiring.

	Fault	Communication Line Failure	Inspect communication connection cables.
		Inappropriate P0-28 (Communication Expansion Card) Setting	Correctly set communication expansion card type.
		Inappropriate PD (Communication Parameter) Group	Correctly set communication parameters.
ERR41	PID Feedback Loss During Operation	PID Feedback Below PA-26 Setting	Check the PID feedback signal or set PA-26 to an appropriate value.
ERR42	Excessive Speed Deviation	Inappropriate Encoder Parameter Settings	Correctly set encoder parameters.
		No Parameter Tuning	Perform motor parameter tuning.
		Inappropriate P9-69 and P9-70 (Excessive Speed Deviation) Settings	Properly set detection parameters according to actual conditions.
ERR43	User-Defined Fault 1	Triggered by Signal of User-Defined Fault 1 Via DI Terminal	Reset operation.
		Triggered by Signal of User-Defined Fault 1 Via Virtual IO Function	Reset operation.
ERR44	User-Defined Fault 2	Triggered by Signal of User-Defined Fault 2 Via DI Terminal	Reset operation.
		Triggered by Signal of User-Defined Fault 2 Via Virtual IO Function	Reset operation.
ERR45	Cycle-by-Cycle Current Limit Fault	Excessive Load or Motor Stalling	Reduce the load and check the motor and mechanical conditions.
		Insufficient AC Drive Capacity	Choose an AC drive with a higher power rating.
ERR46	Data Interaction Fault	Hardware Failure	Seek technical support.
ERR47	Motor Overspeed	Inappropriate Encoder Parameter Settings	Correctly set encoder parameters.
		No Parameter Tuning	Perform motor parameter tuning.

		Inappropriate P9-67 and P9-68 (Excessive Speed Deviation) Settings	Properly set detection parameters according to actual conditions.
ERR48	Magnetic Pole Position Detection Failure	Hardware Failure	Seek technical support.
ERR49	Motor Switching Fault During Operation	Motor Switching Via the Terminal During AC Drive Operation	Perform motor switching after the AC drive stops.
ERR50	SVC Stall Fault	Hardware Failure	Seek technical support.
ERR51	STO Fault	Disconnected STO Signal	Check the STO signal.
ERR52	Brake Resistor Short Circuit	Hardware Failure	Seek technical support.
ERR53	Brake Resistor Continuous Switch-On Timeout	Brake Resistor Too Small	Replace with a proper brake component.
ERR54	Abnormal Back EMF	Brake Module Failure	Seek technical support.
ERR55	Brake Pipe Overload	Brake Resistor Too Small	Replace with a brake assembly of appropriate value.

10. Appendix: Modbus Communication

10.1 Introduction to Modbus Protocol

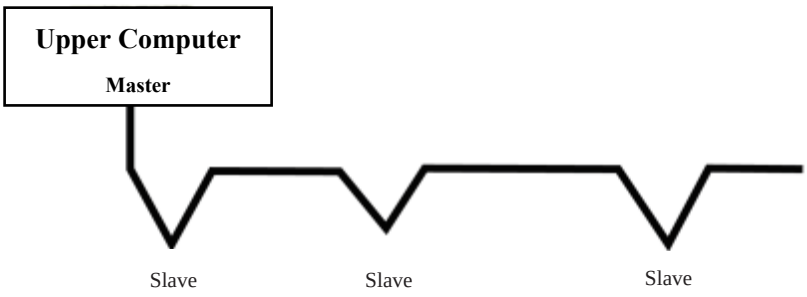
Modbus utilizes the RTU (Remote Terminal Unit) transmission mode. The frame does not contain any message header bytes or end-of-message bytes.

Slave Address	Request Code	Data	CRC16

Data is transmitted in binary code.
CRC16: Cyclic Redundancy Check

10.1.1 Principle

A Master-Slave Protocol



Only one device is allowed to transmit data on the line at any given time.
Data exchange is initiated and managed solely by the master, which sequentially accesses the slaves. Slaves cannot send messages unless invited by the master.
In case of incorrect data exchange, the master retries the query. If no response is received within a specified period, the master determines that the queried slave is missing.
If a slave cannot understand a message, it sends an exception response to the master. The master may or may not respond to this request.
Direct communication between slaves is not allowed. Communication between slaves must be facilitated by the application software, which first queries one slave and then sends the received data to another slave.
Two types of dialog can be established between the master and slaves:

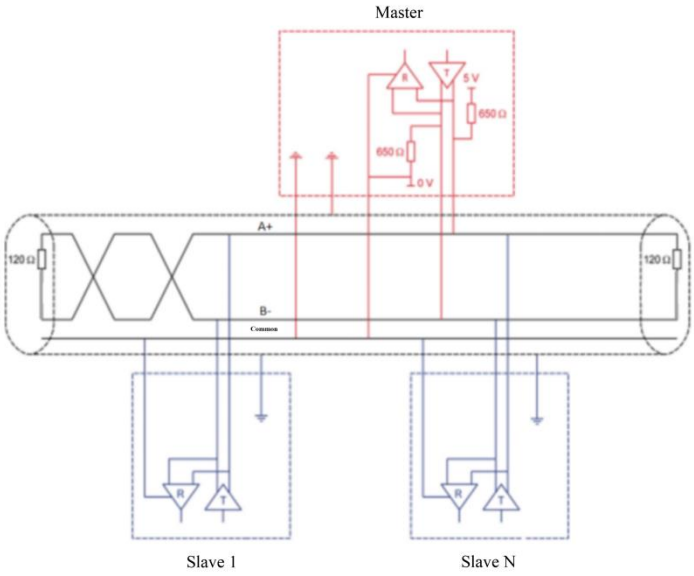
- The master sends a request to a single slave and waits for a response.
- The master sends a request to all slaves without waiting for their responses (broadcast mode).

10.1.2 Addressing

Rules of Addressing:

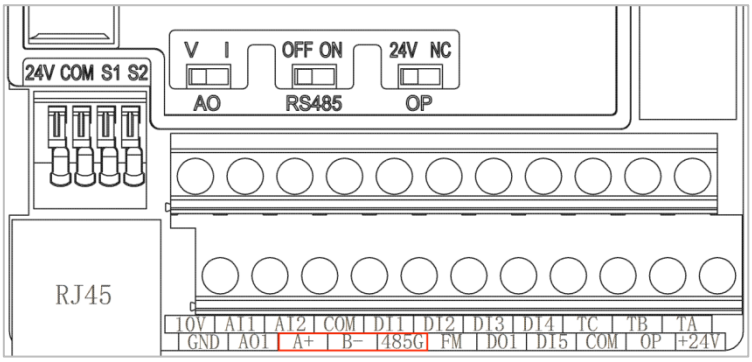
- The Modbus address of the inverter can be set to 1 ~ 247.
- In the request sent by the master, address 0 is reserved for broadcast. The inverter acknowledges the request but does not respond.

10.2 Modbus Diagram



Feature	Definition
Cable Type	Shielded cable with one twisted pair and at least one additional conductor
Maximum Bus Length	1000 meters at 19200 bps baud rate
Maximum Number of Stations (Excluding Repeaters)	32 stations, with 31 being slaves
Line Terminator	A 120Ω resistor
Common Ground Polarity	Connected to protective earth at one or multiple points on the bus

10.2.1 Communication Interface of WD400



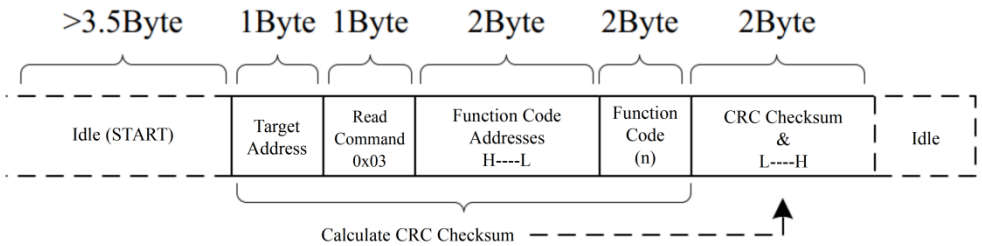
10.2.2 Wiring

Terminal	Signal
A+	485+
B-	485-
485G	GND

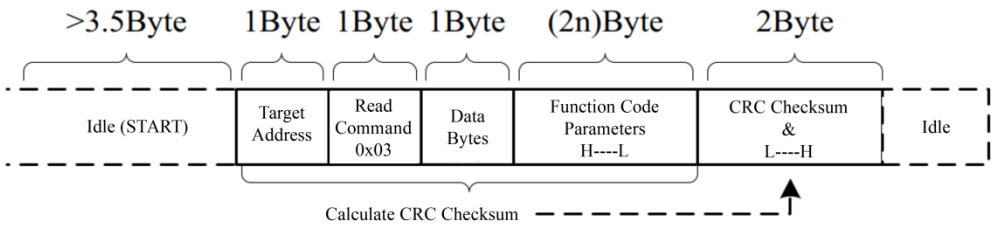
10.3 Communication Data Frame Structure

The Modbus-RTU protocol communication data format is as follows. The AC drive only supports reading or writing of Word-type parameters. The corresponding communication read operation command is 0x03; the write operation command is 0x06, and the multiple write operation command is 0x10. Byte or bit read/write operations are not supported.

Master Read Command Frame

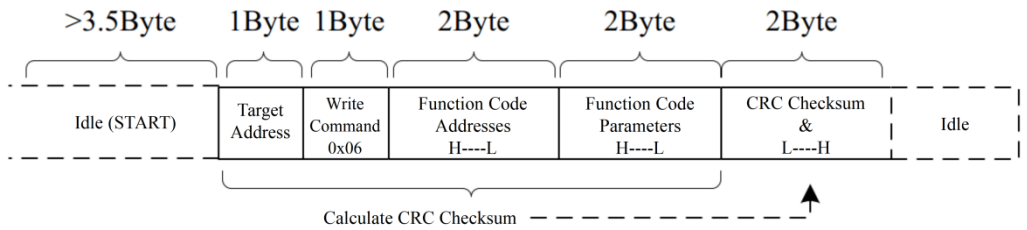


Slave Read Response Frame

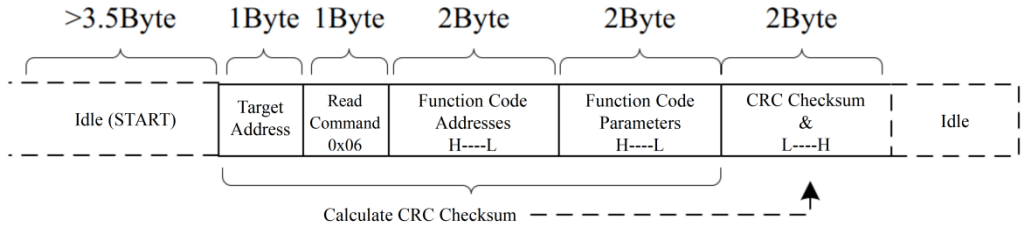


Note: Theoretically, the master can read up to 12 consecutive parameters at a time (i.e., n can be up to 12), but it should not cross the last parameter of the parameter group to avoid error responses.

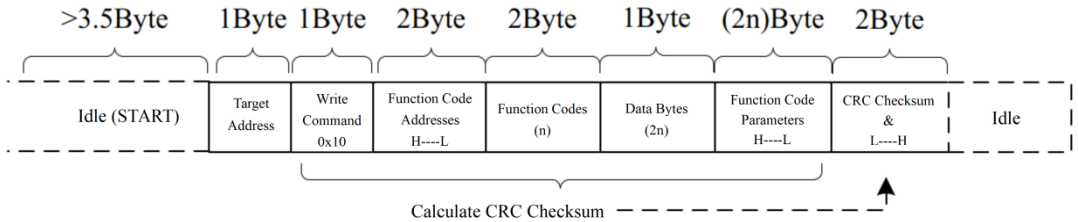
Master Write Command Frame



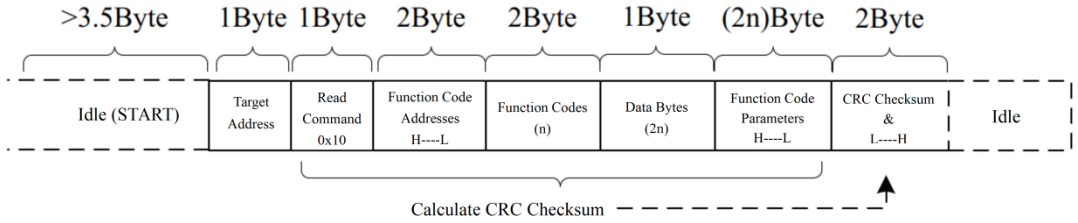
Slave Write Command Frame



Master Multiple Write Command Frame



Slave Multiple Write Command Frame

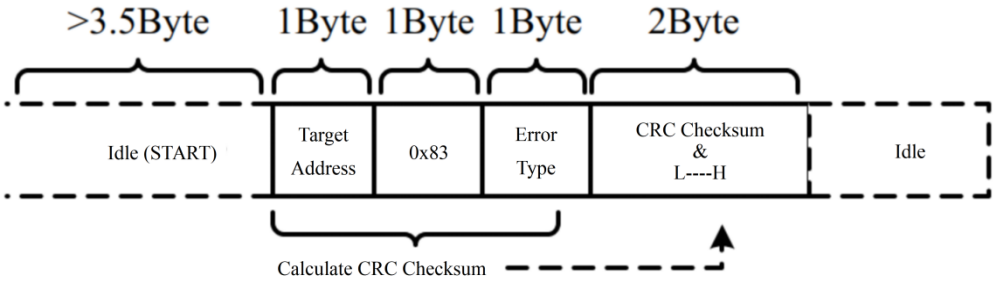


Note: For both multiple read and multiple write, a maximum of 12 consecutive parameters can be operated at a time.

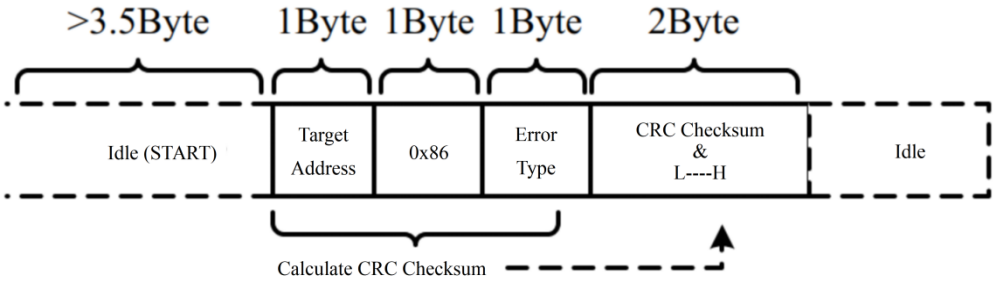
If the slave detects a communication frame error or other reasons for unsuccessful read/write operations (excluding CRC checksum errors), it will respond with an error frame. The slave's read response error command is 0x83, write response error command is 0x86, and multiple write response error command is 0x90.

Error Types: 01: Function Code Error; 02: Address Error; 03: Data Error; 04: Function Not Supported

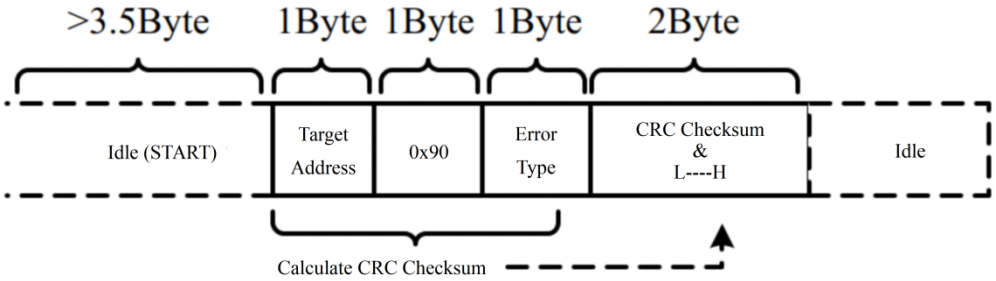
Slave Read Response Error Frame



Slave Write Response Error Frame



Slave Multiple Write Response Error Frame



Data Frame Field Descriptions	
Frame START	An idle period longer than 3.5-character transmission time.
Slave Address (ADR)	Communication Address Range: 1 ~ 247; 0 = Broadcast Sddress.

Command Code (CMD)	03: Read Slave Parameters 06: Write Slave Parameters 10: Multiple Write Slave Parameters.
Parameter Address High (H)	The AC drive's internal parameter address (in hexadecimal) can be parametrical and non-parametrical (e.g., running status and commands). See "Address Definition" for details. High bytes are transmitted first, followed by low bytes.
Parameter Address Low (L)	
Number of Parameters High (H)	Number of parameters to be read in this frame. If 1, one parameter is read. High bytes are transmitted first, followed by low bytes.
Number of Parameters Low (L)	
Number of Data Bytes	Length of the data, twice the number of parameters.
Data High (H)	Response data or data to be written. High bytes are transmitted first, followed by low bytes.
Data Low (L)	
CRC Low	Checksum: CRC1 Checksum. High bytes are transmitted first, followed by low bytes.
CRC High	
END Frame END	An Idle period of 3.5-character time.

10.4 Parameter Address Representation Rules

Parameters are addressed using parameter group numbers and identifiers.

- High Byte: F0 FF (P Group), A0 AF (A Group), B0 BF (B Group), 70 7F (U Group)
- Low Byte: 00 ~ FF

For example, to access Parameter P3-12, the parameter address would be represented as 0xF30C.

Note for U Group:

- U Group is read-only and cannot be modified.
- Some parameters cannot be modified while the AC drive is running.

- Always consider the parameter range, units, and relevant instructions when modifying parameters.

Parameter Group	Communication Access Address	Communication Modification for RAM Parameter Address
P0 ~ PF	0xF000 ~ 0xFFFF	0x0000 ~ 0x0FFF
A0 ~ AC	0xA000 ~ 0xACFF	0x4000 ~ 0x4CFF
B0–B6	0xB000 ~ 0xB6FF	0x5000 ~ 0x56FF
U0	0x7000 ~ 0x70FF	N/A (Read-Only)

Note: Due to the limited lifespan of EEPROM caused by frequent writing, some parameters are designed to be modified only in RAM, bypassing the need for EEPROM storage.

To modify P Group parameters without storing them to EEPROM, replace the high byte "F" with "0".
Similarly, for A group parameters, replace "A" with "4".

The corresponding parameter addresses are represented as follows:
High Byte: 00 ~ 0F (P Group), 40 ~ 4F (A Group)
Low Byte: 00 ~ FF
For example, Parameter P3-12 is not stored in EEPROM, and the address 030CH, and Parameter A0-05 is not stored in EEPROM, and the address is 4005H. These addresses indicate that they are write-only in RAM and invalid if being read.

Stop/Start Parameter

Parameter Address	Parameter Description
1000H	Communication Setting Value (in decimal, write-only): –10000 ~ 10000

Note: Set the communication value as a percentage relative to the maximum frequency (P0-10) or torque limits (P2-10 and A2-48 for the first and second motors, respectively). Values range from -10000 (corresponding to -100.00%) to 10000 (100.00%).

Control Command Inputted to AC Drive (Write-Only):

Command Word Address	Command Function
2000H	0001: Forward Running
	0002: Reverse Running
	0003: Forward Jog
	0004: Reverse Jog

	0005: Free Stop
	0006: Deceleration Stop
	0007: Fault Reset

Digital Output Terminal Control (Write-Only):

Command Word Address	Command Function
2001H	BIT0: DO1 Output Control BIT1: DO2 Output Control BIT2: RELAY1 Output Control BIT3: RELAY2 Output Control BIT4: FMR Output Control BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

Analog Output AO1 Control (Write-Only):

Command Word Address	Command Function
2002H	0 ~ 7FFF indicates 0％ ~ 100％.

Analog Output AO2 Control (Write-Only):

Command Word Address	Command Function
2003H	0 ~ 7FFF indicates 0％ ~ 100％.

PULSE Output Control (Write-Only):

Command Word Address	Command Function
2004H	0 ~ 7FFF indicates 0％ ~ 100％.

Read AC Drive Status (Read-Only):

Status Word Address	Status Word Function
3000H	0001: Forward Running
	0002: Reverse Running
	0003: Stop

AC Drive Fault Description:

AC Drive Fault Address	AC Drive Fault Message	
8000H	0000: No Fault 0001: IGBT Fault	0033: Charging Resistor Overload 0034: External Device Fault

	0002: Overcurrent During Acceleration 0003: Overcurrent During Deceleration 0004: Overcurrent at Constant Speed 0005: Overvoltage During Acceleration 0006: Overvoltage During Deceleration 0007: Overvoltage at Constant Speed 0008: Undervoltage Fault 0009: AC Drive Overload 0010: Module Overheat 0012: Input Phase Loss 0013: Output Phase Loss 0017: Current Detection Fault 0018: Pre-Charge Fault 0019: EEPROM Read/Write Fault 0020: Encoder Fault 0023: Parameter Self-Tuning Fault 0030: Motor Overload 0031: Motor Overheat 0032: Ground Short Circuit Fault 0033: Charging Resistor Overload 0034: External Device Fault 0037: Cumulative Running Time Reached	0036: Data Exchange Fault 0038: Cumulative Power-On Time Reached 0039: Underload 0040: Communication Fault 0041: PID Feedback Loss During Operation 0042: Excessive Speed Deviation Fault 0043: User-Defined Fault 1 0044: User-Defined Fault 2 0045: Cycle-by-Cycle Current Limit Fault 0046: Data Interaction Fault 0047: Motor Overspeed 0048: Magnetic Pole Position Detection Failure 0049: Motor Switching Fault During Operation 0050: SVC Stall Fault 0051: STO Fault 0052: Brake Resistor Short Circuit 0053: Brake Resistor Continuous Switch-On Timeout 0054: Abnormal Back EMF 0055: Brake Pipe Overload

Parameter Lock Password Verification:

If the actual password value is returned, it indicates successful password verification. If no password is set (i.e., the password is 0), the system returns 0000H.

Password Address	Password Content
1F00H	*****

10.5 Introduction to PD Communication Parameters

Parameter PD-00 is used to set the data transfer rate between the upper computer and the AC drive. Both devices must be configured to the same baud rate to ensure successful communication. The higher the baud rate, the faster the communication.

Parameter	Parameter	Factory Setting	Setting Range

Code	Name		
PD-00	Baud Rate	5005	Ones: Modbus Baud Rate 2: 1200bps 3: 2400bps 4: 4800bps 5: 9600bps 6: 19200bps 7: 38400bps 8: 57600bps 9: 115200bps

Parameter PD-01 has to be the same for the upper computer and the AC drive to ensure successful communication.

Parameter Code	Parameter Name	Factory Setting	Setting Range
PD-01	Data Format	0	0: No Check; Data Format (8-N-2) 1: Even Parity Check; Data Format (8-E-1 2: Odd Parity Check; Data Format (8-O-1) 3: No Check; Data Format (8-N-1)

When Parameter PD-02 is set to 0 as the broadcast address, it enables point-to-point communication between the upper computer and the AC drive. The local address is unique (except for 0), which ensures successful point-to-point communication.

Parameter Code	Parameter Name	Factory Setting	Setting Range
PD-02	Local Address	1	1 ~ 247; 0 is the broadcast address

Response Delay: It refers to the interval time from the AC drive receiving data to sending a response to the upper computer.

If Parameter PD-03 is less than the system processing time, the delay equals the system processing time. If Parameter PD-03 is greater than the system processing time, the system will finish data processing and wait until the delay time is reached before sending data to the upper computer.

Parameter Code	Parameter Name	Factory Setting	Setting Range
PD-03	Response Delay	2ms	0 ~ 20ms

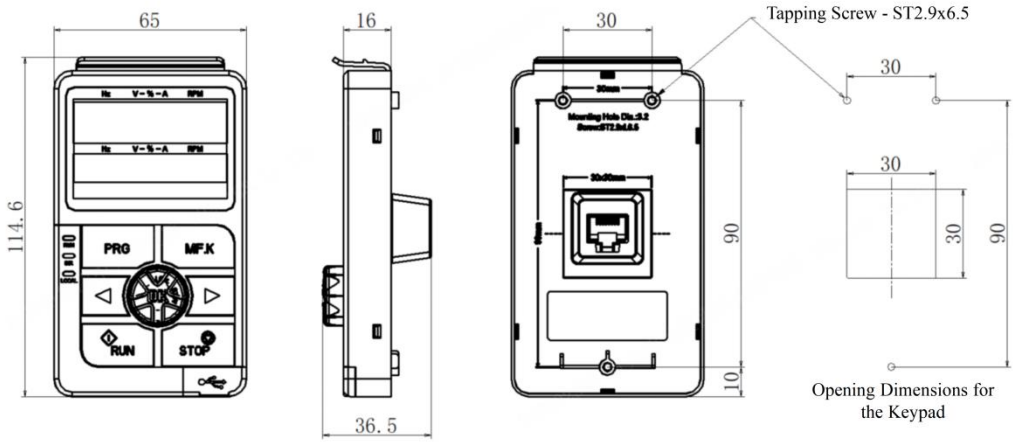
If Parameter is set to 0.0s, the communication timeout parameter is invalid.

If Parameter is set to a valid value, and the interval between one communication and the next exceeds the communication timeout, the system will report a communication fault (Err40). Typically, it is set to 0.0s. In a continuously communicating system, this Parameter is used to monitor the communication status.

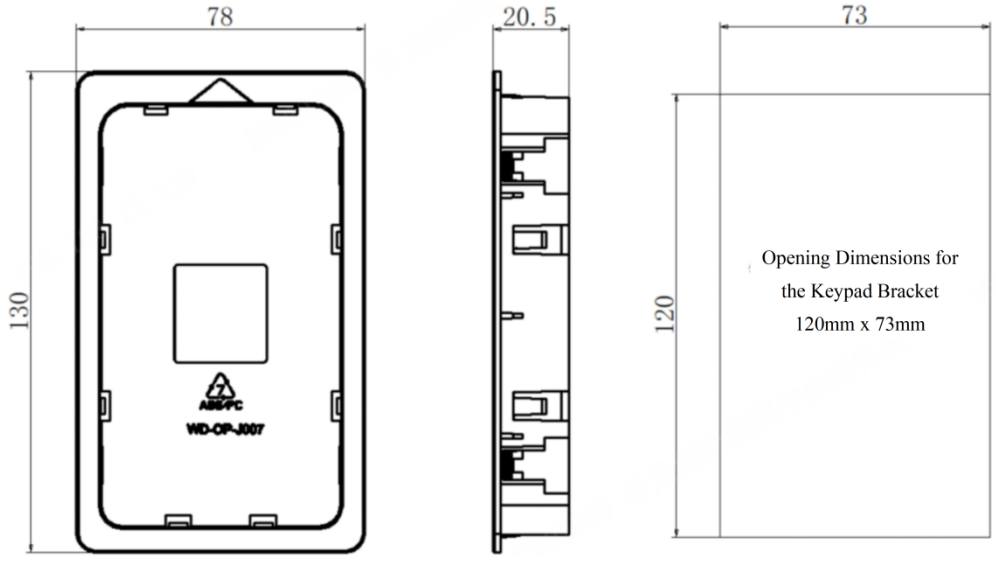
Parameter Code	Parameter Name	Factory Setting	Setting Range
PD-04	Communication Timeout	0.0s	0.0s (Invalid); 0.1 ~ 60.0s

11. Appendix: Keypad Installation Diagrams

11.1 Opening for the Keypad



11.2 Opening for the Keypad Bracket



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