User Manual

Mini Series Vector Inverter

Contents

Chapter 1 Safety Information and Precautions

Chapter 2 Product Information

Chapter 3 Wiring

Chapter 4 Setup

Chapter 5 Troubleshooting

Chapter 6 Parameter Table

Chapter 7 485 Communication Protocol

Warranty

Warranty Card

Certificate of quality

Chapter 1
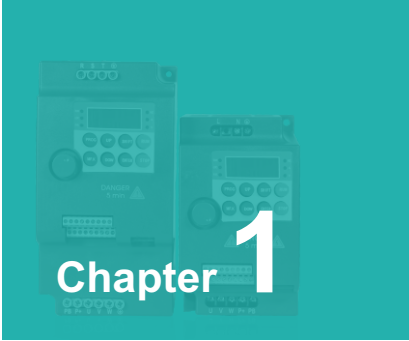
Safety Information and Precautions

This guide is packaged together with the product. It contains basic information for quick start of the drive.

Electrical Safety

Extreme care must be taken at all times when working with the AC Drive or within the area of the AC Drive. The voltages used in the AC Drive can cause severe electrical shock or burns and is potentially lethal. Only authorized and qualified personnel should be allowed to work on AC Drives.

Machine/System Design and Safety of Personnel

Machine/system design, installation, commissioning startups and maintenance must be carried out by personnel who have the necessary training and experience. They must read this safety information and the contents of this manual. If incorrectly installed, the AC Drive may present a safety hazard.

The AC Drive uses high voltages and currents (including DC), carries a high level of stored electrical energy in the DC bus capacitors even after power OFF. These high voltages are potentially lethal.

The AC Drive is NOT intended to be used for safety related applications/functions. The electronic "STOP &START" control circuits within the AC Drive must not be relied upon for the safety of personnel. Such control circuits do not isolate mains power voltages from the output of the AC Drive. The mains power supply must be disconnected by an electrical safety isolation device before accessing the internal parts of the AC Drive.

Safety risk assessments of the machine or process system which uses an AC Drive must be undertaken by the user and or by their systems integrator/designer. In particular the safety assessment/design must take into consideration the consequences of the AC Drive failing or tripping out during normal operation and whether this leads to a safe stop position without damaging machine, adjacent equipment and machine operators/ users. This responsibility lies with the user or their machine/process system integrator.

The system integrator/designer must ensure the complete system is safe and designed according to the relevant safety standards. Our can provide recommendations related to the AC drive to ensure long term safe operation.

Electrical Installation - Safety

Electrical shock risk is always present within an AC Drive including the output cable leading to the motor terminals. Where dynamic brake resistors are fitted external to the AC Drive, care must be taken with regards to live contact with the brake resistors, terminals which are at high DC voltage and potentially lethal. Cables from the AC Drive to the dynamic brake resistors should be double insulated as DC voltages are typically 600 to 700 VDC.

Mains power supply isolation switch should be fitted to the AC Drive. The mains power supply must be disconnected via the isolation switch before any cover of the AC Drive can be removed or before any servicing work is undertaken stored charge in the DC bus capacitors of the PWM AC Drive is potentially lethal after the AC supply has been disconnected. The AC supply must be isolated at least 10 minutes before any work can be undertaken as the stored charge will have been discharged through the internal bleed resistor fitted across the DC bus capacitors.

Whenever possible, it is good practice to check the DC bus voltage with a VDC meter before accessing the AC Drive bridge. Where the AC Drive input is conne-cted to the mains supply with a plug and socket, then upon disconnecting the plug and socket, be aware that the plug pins may be exposed and internally connected to the DC bus capacitors (via the internal bridge rectifier in reversed bias). Wait 10 minutes to allow stored charge in the DC bus capacitors to be dissipated by the bleed resistors before commencing work on the AC Drive.

Electrical Shock Hazard

Ensure the protective earthing conductor complies with technical standards and local safety regulations. Because the leakage current exceeds 3.5 mA in all models, IEC 61800- 5-1 states that either the power supply must be automatica-lly disconnected in case of discontinuity of the protective earthing conductor or a protective earthing conductor with across-section of at least 10 mm2 (Cu) or 16 mm2 (Al) must be used. Or use two PE wires and each wire must satisfy the IEC requirements independently. Failure to comply may result in death or serious injury.

When using an earth leakage circuit breaker, use a residual current operated protective device (RCD) of type B (breaker which can detect both AC and DC). Leakage current can cause unprotected components to operate incorrectly. If this is a problem, lower the carrier frequency, replace the components in question with parts protected against harmonic current, or increase the sensitivity amperage of the leakage breaker to at least 100 mA per drive.

❶ Factors in determining leakage current:

❶ Size of the AC drive;

❷ AC drive carrier frequency;

❸ Motor cable type and length;

❹ EMI/RFI filter.
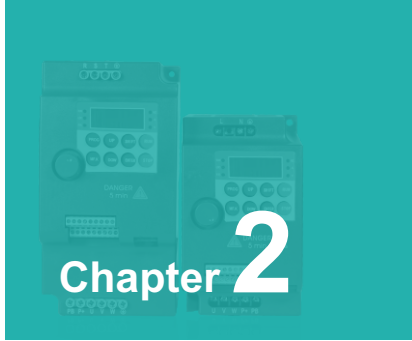
Chapter 2

Product Information

2.1 Nameplate

MODEL: 4T-1.5G
SOURCE: PH AC380V 50/60Hz
OUTPUT: 1.5KW 3.8A 0-600Hz

A BDDG3DFDF122466

2.2 Naming Method

$$\underset{①}{4} \quad \underset{②}{T} - \underset{③}{1.5} \, \underset{④}{G}$$

Code	No.	Content
Voltage level	①	2 : 220V 4 : 380V
Voltage Classification	②	S : Single-phase T : Three phase
Adapted motor powe	③	0.4KW~15KW
Model	④	Heavy-duty

2.3 General Specifications

AC Drive Model	Power Capacity (KVA)	Rated Input Current(A)	Rated Output Current(A)
Input voltage: Single-phase 220V Range: -15%~20%			
2S-0.4G	1.0	5.8	2.5
2S-0.7G	1.5	8.2	4
2S-1.5G	3.0	14.0	7
2S-2.2G	4	23.0	9.6
2S-4.0G	6.6	39.0	16.5
2S-5.5G	8	48.0	20
Input voltage: Three-phase 380V Range: -15%~20%			
4T-0.7G	1.5	3.4	2.1
4T-1.5G	3.0	5.0	3.8
4T-2.2G	4.0	5.8	5.1
4T-4.0G	5.9	10.5	9.0
4T-5.5G	8.9	14.6	13.0
4T-7.5G	12	20	17
4T-11G	17.7	26	25
4T-15G	24.2	35	32

2.4 Dimensions

Dimensions(mm)		
L	**W**	**H**
Single-phase 220V		
140	85	105
140	85	105
140	85	105
140	85	105
240	105	150
240	105	150
Three-phase 380V		
140	85	105
140	85	105
140	85	105
180	100	115
180	100	115
180	100	115
240	105	150
240	105	150
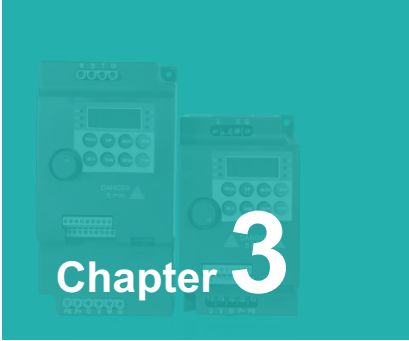
Chapter 3

Wiring

3.1 Typical Wiring

✦ Wiring of Three-phase 380 VAC Power Supply.
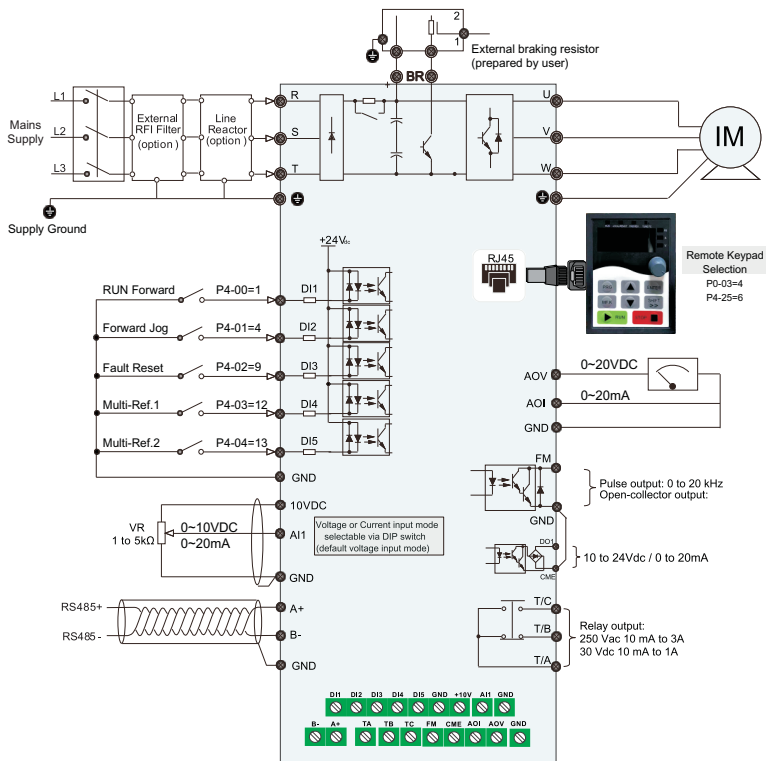
Terminal	Terminal Name	Terminal	Terminal Name
D1~D5	Digital Input X5	Ai1	Analog Input X1
A,B	RS485 X1	TA,TB,TC	Relay Output X1
D5/FM,CME	HDI (High Speed Pulse Input /Output) X1		

3.2 Terminals

✧ Terminals of Main Circuit.

Terminal	Terminal Name	Description
R,S,T	Three-phase power supply input terminals.	Connect to the three-phase AC power supply.
P+,PB	Connecting terminals of braking resistor.	Connect to a braking resistor.
U, V, W	Output terminals	Connect to a three-phase motor.
⏚	Grounding terminal	Must be grounded.

✧ Terminals of Control Circuit

Terminal	Terminal Name	Description
+10V-GND	+10 VDC power supply	Provide +10 VDC power supply externally. Usually, it provides power supply to the external potentiometer with resistance range of 1 to 5 kQ. Max. output current: 10 mA.
+24V-COM	+24 VDC power supply	Provide +24 VDC power supply externally. Usually, it provides power supply to DI/DO terminals and external sensors. Max. output current: 200 mA.
OP	Input terminal of external power supply	Connect to +24 VDC by default. Whether it connects to +24 V or COM is decided by jumper J7. When DI1 to DI5 need to be driven by the external signal, OP needs to be connected to the external power supply and be disconnected from +24 VDC.
AI1-GND	Analog input 1	Ai1 input voltage range: 0 to 10 VDC. AI2 input range: 0 to 10 VDC or 4 to 20 mA. Impedance: 22 kQ.
AI2-GND	Analog input 2	
DI1-COM	Digital input 1	Optical coupling isolation, compatible with dual-polarity input. Impedance: 2.4 kQ. Input voltage range: 9 to 30 VDC.
DI2-COM	Digital input 2	
DI3-COM	Digital input 3	
DI4-COM	Digital input 4	

Chapter 3

Terminal	Terminal Name	Description
DI5-COM	High-speed pulse input	Besides features of DI1 to DI4, it can be used for high-speed pulse input. Max. input frequency: 20kHz.
AO1-GND	Analog output 1	Voltage or current output, determined by jumper J5 on the control board. Output voltage range: 0 to 10VDC. Output current range: 0 to 20mA.
DO1-CME	Digital output 1	Multi-function open-collector output. Voltage range: 0 to 24VDC. Current range: 0 to 50mA. Output pulse frequency range: 0 to 50kHz. For jumper J6, CME and COM are shorted by default.
FM-COM	High-speed pulse output	
485+-485-	Communication terminal	Modbus protocol (baud rate: 300 to 115200 bps) Max. nodes: 32. Terminal resistance switch: S1.
T/A-T/B	Normally closed terminal	Contact driving capacity: 250VAC, 3A; 30VDC, 1A.
T/A-T/C	Normally open terminal	
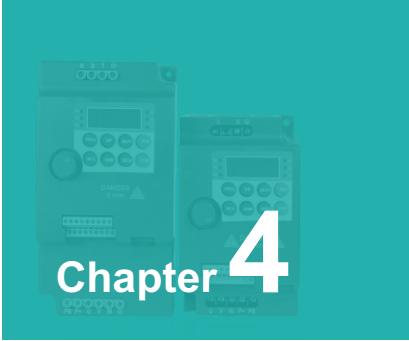
Chapter 3

Chapter 4

Setup

4.1 Logic of Control

✧ Complete Timing Diagram
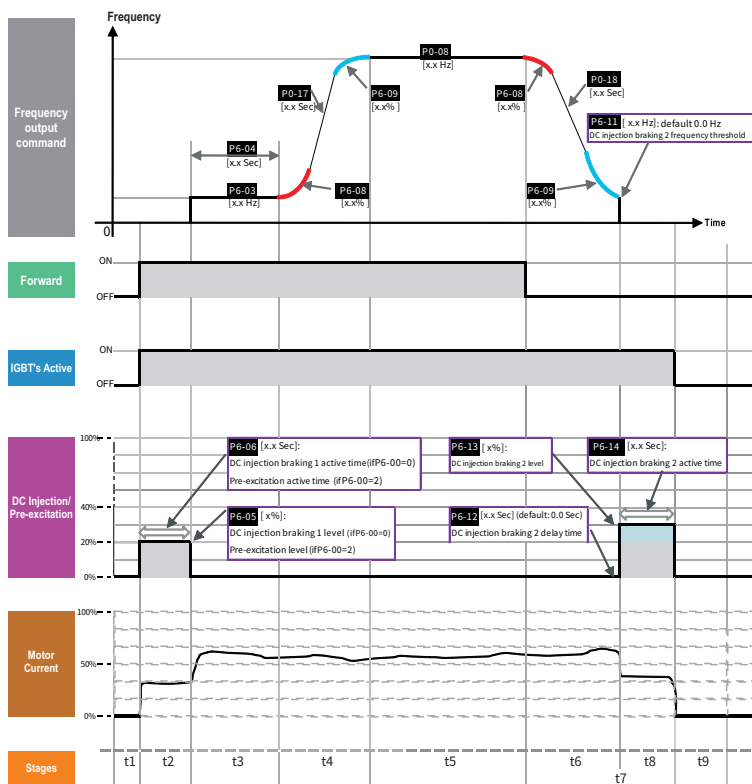
✧ Timing Diagram Description

Event	Description	Para. No.	Status
t1	The AC drive waits for the RUN signal.	—	Inhabit
t2	The AC drive receives the Forward RUN command.	—	RUN
	The IGBT becomes active.	—	
	DC injection braking 1/Pre-excitation is enabled if P6-06 > 0.	P6-05	
	(if P6-00 = 0, it is "DC injection braking 1"; if P6-00 = 2, it is "Pre-excitation")	P6-06	
t3	DC injection braking 1/Pre-excitation is disabled.	—	RUN
	The startup frequency becomes active if P6-04 > 0.	P6-03	
		P6-04	
t4	The startup frequency becomes inactive.	—	RUN
	The motor ramps up to the expected frequency.	P0-17	
	S-curve active	P6-08	
		P6-09	
t5	Motor runs at expected frequency.	P0-08	RUN
t6	The Forward RUN command is cancelled.	—	RUN
	The motor ramps down to zero frequency.	P0-18	
	S-curve active	P6-08	
		P6-09	
t7	The frequency output command reaches the DC injection braking 2 frequency threshold.	P6-11	RUN (if P6-12 = 0) Inhabit (if P6-12 > 0)
	The IGBT shall become inactive if DC injection braking 2 delay time is not zero.	P6-12	
	After the delay time set in P6-12, the IGBT becomes active again	—	
t8	DC injection braking 2 is enabled if P6-14 > 0	P6-13	RUN
		P6-14	
t9	DC injection braking 2 is disabled.	—	Inhabit
	The IGBT turns inactive.	—	

Chapter 4

4.2 Step By Step Setup

✧ Setup Flowchart

Check Nameplate and wiring	→ Refer to Chapters 1 and 2
Apply main power to AC drive	
Get familiar with keypad	①
Set motor parameters	②
Set motor control mode	③
Perform motor tuning if it is SVC control mode	④
Set frequency reference	⑤
Set operation mode	⑥
Set start mode and stop mode	⑦
Set acceleration and deceleration time	⑧
Set DI and DO if needed	⑨
Set startup frequency if needed	⑩
Set S-curve if needed	⑪
Set DC injection braking/pre-excitation if needed	⑫
RUN!	
Check motor rotation and machine travelling direction	→ Refer to User Manual
Check motor current	→ Refer to User Manual
Set PI of velocity loop if It is SVC controlling mode	⑬

Chapter 4

Step 1: Get Familiar With Keypad

Indicators

Name		Function Description				
Status indicator	RUN	It indicates the state of the AC drive. OFF indicates the stop state, ON (green) indicates the running state, and ON (red) indicates the faulty state.				
	LOC	Keyboard operation, terminal operation and remote operation (communication control) indicator.				
	FWD	It indicates forward or reverse rotation. OFF indicates forward rotation and ON indicates reverse rotation.				
Unit indicator	Hz	Frequency unit	A	Current unit	V	Voltage unit
LED Display	The 5-digit LED display is able to display the frequency reference, output frequency, monitoring data and fault codes.					

Keys On Keypad

Key	Key Name	Function
PROG	Programming	Enter or exit Level I menu.
ENTER	Confirm	Enter the menu interfaces level by level, and confirm the parameter setting.

Key	Key Name	Function
UP	Increment	Increase data or Para. No..
DOW	Decrement	Decrease data or Para. No..
SHIFT	Shift	Select the displayed parameters in turn in the stop or running state, and select the digit to be modified when modifying parameters.
RUN	RUN	Start the AC drive in the keypad operation mode.
STOP	Stop	Stop the AC drive when it is in the running state and perform the reset operation when it is in the faulty state. The functions of this key are restricted by P7-02.
MF.K	Multifunction	Perform function switchover (such as quick switchover of command source or direction) according to the setting of P7-01.

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P7-01	MF.K key function selection	0: MF.K key disabled 1: Switchover from remote control (terminal or communication) to keypad control 2: Switchover between forward rotation and reverse rotation 3: Forward jog 4: Reverse jog 5: Individualized parameter display	N.A.	0	
P7-02	STOP/ RESET key function	0: STOP/RESET key enabled only in keypad control 1: STOP/RESET key enabled in any operation mode	N.A.	1	

Keypad Operation
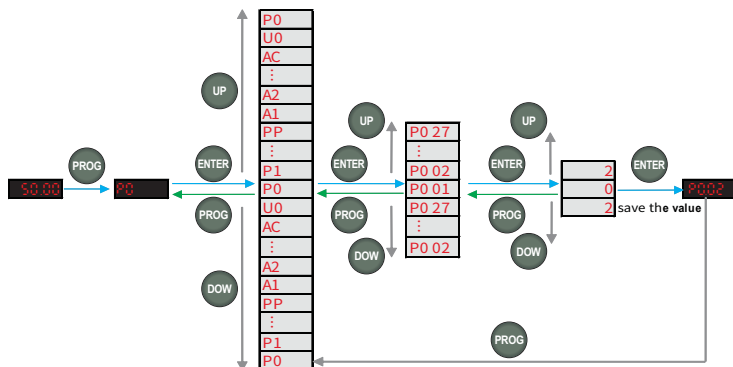
Para. No. Arrangement

Para. Group	Description	Remark
P0 to PP	Standard parameter group	Standard function parameters
A0 to AC	Advanced parameter group	AI/AO correction
U0	Running state parameter group	Display of basic parameters

Step 2: Set Motor Parameters

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P1-00	Motor type selection	0: Common asynchronous motor 1: Variable-frequency asynchronous motor	N.A.	0	
P1-01	Rated motor power	0.1 to 30.0	kW	Model dependent	
P1-02	Rated motor voltage	1 to 1000	V	Model dependent	
P1-03	Rated motor current	0.01 to 655.35	A	Model dependent	

Chapter 4

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P1-04	Rated motor frequency	0.01 to max frequency	Hz	Model dependent	
P1-05	Rated motor speed	1 to 65535	RPM	Model dependent	

Step 3: Set Motor Control Mode
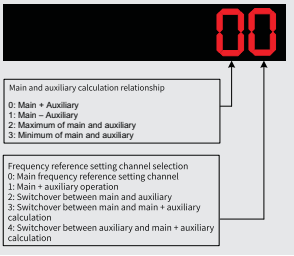
Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P0-01	Motor 1 control mode	0: Sensorless vector control (SVC) 2: Voltage/Frequency control (V/F)	N.A.	2	

Step 4: Perform Motor Tuning If It's SVC Control Mode

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P1-37	Auto-tuning selection	0: No auto-tuning 1: Static auto-tuning 1 2: Complete dynamic autotu-ning	N.A.	0	

Step 5: Set Frequency Reference

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P0-03	Main frequency source X selection	0: Digital setting P0-08 (nonretentive at power down) 1: Digital setting P0-08 (retentive at power down) 2: Ai1 3: Ai2 4: Reserved	N.A.	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P0-03	Main frequency source X selection	5: Pulse reference (Di5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication reference	N.A.	0	
P0-04	Auxiliary frequency source Y selection	The same as P0-03 (Main frequency source X selection)	N.A.	0	
P0-07	Frequency source superposition selection	Main and auxiliary calculation relationship 0: Main + Auxiliary 1: Main − Auxiliary 2: Maximum of main and auxiliary 3: Minimum of main and auxiliary Frequency reference setting channel selection 0: Main frequency reference setting channel 1: Main + auxiliary operation 2: Switchover between main and auxiliary 3: Switchover between main and main + auxiliary calculation 4: Switchover between auxiliary and main + auxiliary calculation		00	
P0-08	Preset frequency	0.00 to max frequency	Hz	50.00	
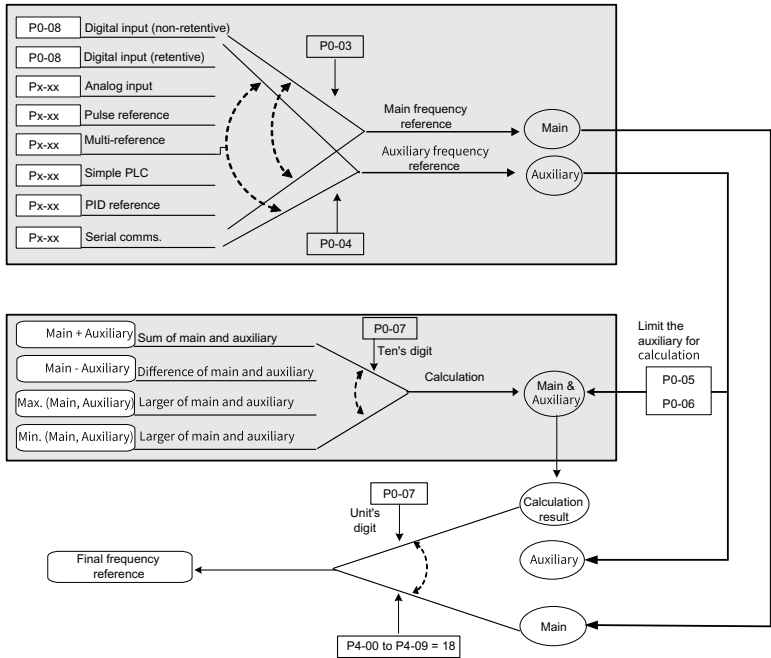
Step 6: Select Operation Mode

Para. No.	Para. Name	Setting Range	Unit	Defa ult	Comm ission
P0-02	Command source selection	0: Keypad control 1: Terminal control 2: Communication control	N.A.	2	
P4-11	Terminal command mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	N.A.	2	
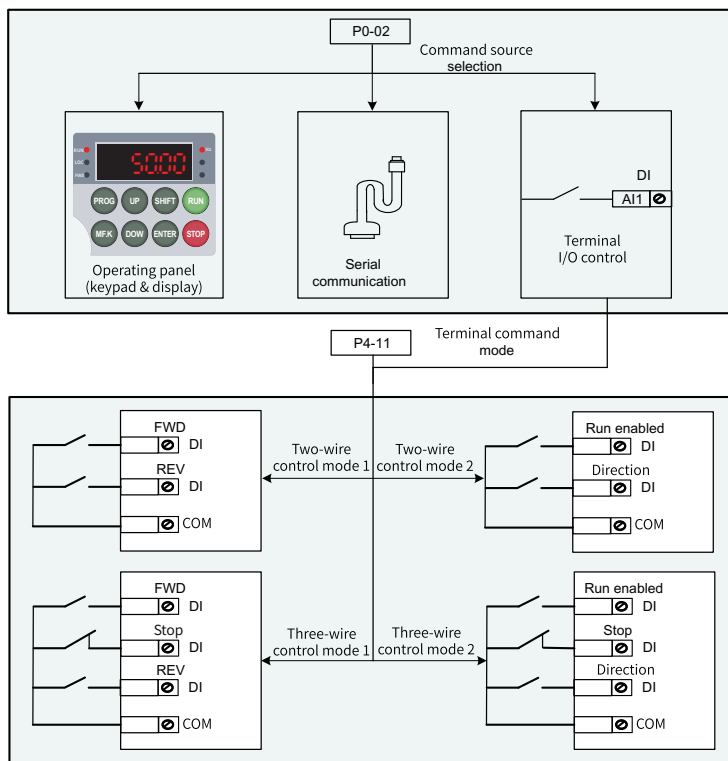
Step 7: Set Start Mode And Stop Mode

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P6-00	Start mode	0: Direct startup 1: Reserved 2: Pre-excited startup	N.A.	0	
P6-01	Stop mode	0: Decelerate to stop 1: Coast to stop	N.A.	0	
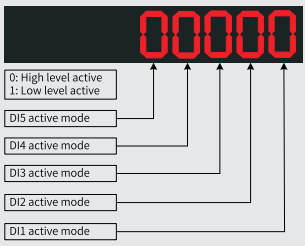
Step 8: Set Acceleration And Deceleration Parameters

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P0-17	Acceleration time 1	0.00 to 650.00 (if P0-19 = 2) 0.0 to 6500.0 (if P0-19 = 1) 0 to 65000 (if P0-19 = 0)	s	2	
P0-18	Deceleration time 1	0.00 to 650.00 (if P0-19 = 2) 0.0 to 6500.0 (if P0-19 = 1) 0 to 65000 (if P0-19 = 0)	s	2	
P0-18	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	N.A.		
P6-07	Acceleration/ Deceleration mode	0: Linear mode 1: S-curve mode A 2: S-curve mode B	N.A.		

Step 9: Set DI And DO If Needed

DI Setting

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P4-00	DI1 function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three-wire control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop	N.A.	1 FWD	
P4-01	DI2 function selection	9: Fault reset (RESET) 10: RUN pause 11: External fault normally open (NO) input 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3 15: Multi-reference terminal 4	N.A.	4 FJOG	

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P4-02	DI3 function selection	16: Terminal 1 for acceleration/deceleration time selection 17: Terminal 2 for acceleration/deceleration time selection 18: Frequency source switchover 19: UP and DOWN setting clear (terminal, keypad) 20: Command source switchover terminal 1 21: Acceleration/Deceleration prohibited	N.A.	1 FWD	
P4-03	DI4 function selection	22: PID pause 23: PLC status reset 24: Wobble pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control prohibited 30: Pulse input (enabled only for Di5) 31: Reserved	N.A.	4 FJOG	
P4-04	DI5 function selection	32: Immediate DC injection braking 33: External fault normally closed (NC) input 34: Frequency modification forbidden 35: PID action direction reverse 36: External STOP terminal 1 37: Command source switchover terminal 2 38: PID integral disabled 39: Switchover between main frequency source X and preset frequency	N.A.	9 RESET	
P4-05	DI4 function selection	40: Switchover between auxiliary frequency source Y and preset frequency 41: Motor selection terminal 1 41: Motor selection terminal 1 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2	N.A.	12 Multiref erence terminal 1	

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
		46: Speed control/Torque control switchover 47: Emergency stop 48: External STOP terminal 2 49: Deceleration DC injection braking 50: Clear the current running time 51: Two-wire/Tree-wire switchover 52: Reverse frequency prohibited 53–59: Reserved			
P4-10	DI filter time	0.000 to 1.000	s	0.010	
P4-35	DI1 delay	0.0 to 3600.0	s	0.0	
P4-36	DI2 delay	0.0 to 3600.0	s	0.0	
P4-37	DI3 delay	0.0 to 3600.0	s	0.0	
P4-38	DI active mode selection 1		N.A.	00000	
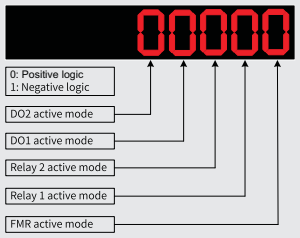
Note:

➢ The screw is connected by default;

➢ The screw cannot be re-connected once it is cut. This will result in an increase in leakage current to ground during drive running. Take full consideration before cutting the jumper.

DO Setting

Para. No.	Para. Name	Setting Range	Unit	Defa ult	Comm ission
P5-00	FM terminal output mode	0: Pulse output (FMP) 1: Switch signal output (FMR)	N.A.	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P5-01	FMR function(opencoll ector output terminal) selection	0: No output 1: AC drive running 2: Fault output 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running (no output at stop)	N.A.	0 No output	
P5-02	Relay function(T/A-T/B-T/C)sele ction	6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Set count value reached 9: Designated count value reached 10: Length reached 11: PLC cycle completed 12: Accumulative running time reached 13: Frequency limited	N.A.	2 Fault output	
P5-03	Extensio n card relay function(P/A-P/B-P/C)sele ction	14: Torque limited 15: Ready for RUN 16: Reserved 17: Frequency upper limit reached 18: Frequency lower limit reached (no output at stop) 19: Undervoltage state output 20: Communication setting	N.A.	0 No output	
P5-04	DO1 function selection (opencoll ector output terminal)	21: Reserved 22: Reserved 23: Zero-speed running 2 (having output at stop) 24: Accumulative power-on time reached 25: Frequency level detection FDT2 output 26: Frequency 1 reached	N.A.	1 AC drive running	
P5-05	Extensio n card DO2 function selection	27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Timing duration reached 31: AI1 input limit exceeded 32: Load lost 33: Reverse running 34: Zero current state	N.A.	4 Frequ-ency reached	

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P5-05	Extension card DO2 function selection	35: IGBT temperature reached 36: Output current limit exceeded 37: Frequency lower limit reached (having output at stop) 38: Alarm output 39: Reserved 40: Current running time reached 41: Fault output (no output at undervoltage)	s	0.0	
P5-17	FMR output delay time	0.0 to 3600.0	s	0.0	
P5-18	Relay 1 output delay time	0.0 to 3600.0	s	0.0	
P5-19	Relay 2 output delay time	0.0 to 3600.0	s	0.0	
P5-20	Do1 output delay time	0.0 to 3600.0	s	0.0	
P5-21	Do2 output delay time	0.0 to 3600.0	s	0.0	
P5-22	DO active mode selection	00000 0: Positive logic / 1: Negative logic DO2 active mode DO1 active mode Relay 2 active mode Relay 1 active mode FMR active mode	N.A.	00000	

Note:

➢ Positive logic means that, DO output terminal is normally the default state.

➢ Negative logic means the opposite situation.

Step 10: Set Startup Frequency If Needed

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P6-03	Startup frequency	0.00 to 10.00	Hz	0.00	
P6-04	Startup frequency active time	0.0 to 100.0	s	0.0	

Step 11: Set S-Curve If Needed

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P6-07	Acceleration/ Deceleration mode	0: Linear mode 1: S-curve mode A 2: S-curve mode B	N.A.	0	1
P6-08	Time proportion of S-curve start segment	0.0 to [100.0 minus P6-09]	%	30.0	
P6-09	Time proportion of S-curve end segment	0.0 to [100.0 minus P6-08]	%	30.0	

Step 12: Set DC Injection Braking/Pre-excitation If Needed

Para. No.	Para. Name	Setting Range	Unit	Default	Comm ission
P6-00	Start mode	0: Direct startup 1: Reserved 2: Pre-excited startup	N.A.	0	
P6-05	DC injection braking 1 level	0 to 100	%	0	
P6-06	DC injection braking 1 active time	0.0 to 100.0	s	0.0	
P6-11	DC injection braking 2 frequency threshold	0.00 to 10.00	Hz	0.00	

Chapter 4

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P6-12	DC injection braking 2 delay time	0.0 to 100.0	s	0.0	
P6-13	DC injection braking 2 level	0 to 100	%	50	
P6-14	DC injection braking 2 active time	0.0 to 100.0	s	0.0	

Note:

➢ Only when P6-00 = 0, parameters P6-05 and P6-06 are related to DC injection braking 1.

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P6-00	Start mode	0: Direct startup 1: Reserved 2: Pre-excited startup (asynchronous motor)	N.A.	0	2
P6-05	Pre-excitation level	0 to 100	%	50	
P6-06	Pre-excitation active time	0.0 to 100.0	s	0.0	

Note:

➢ Only when P6-00 = 2, parameters P6-05 and P6-06 are related to pre¬excitation.

Step 13: Set PI of Velocity Loop If It's SVC Control Mode

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P2-00	Speed loop proportional gain 1	1 to 100	N.A.	30	
P2-01	Speed loop integral time 1	0.01 to 10.00	s	0.50	
P2-02	Switchover frequency 1	0.00 to P2-05	N.A.	5.00	
P2-03	Speed loop proportional gain 2	1 to 100	N.A.	20	
P2-04	Speed loop integral time 2	0.01 to 10.00	s	1.00	

Chapter 5
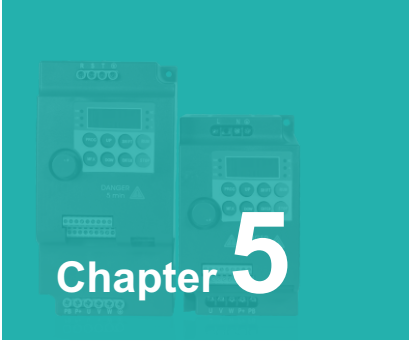
Troubleshooting

5.1 Faults and Solutions

Display	Fault Name	Possible Causes	Solutions
Err02	Overcurrent during acceleration	1.The output circuit is short circuited. 2.The acceleration time is too short. 3.Manual torque boost or V/F curve is not appropriate. 4.The power supply is too low. 5.The startup operation is performed on the rotating motor. 6.A sudden load is added during acceleration. 7.The AC drive model is of too small power class.	1: Eliminate short circuit. 2: Increase the acceleration time. 3: Adjust the manual torque boost or V/F curve. 4: Check that the power supply is normal. 5: Select speed tracking restart or start the motor after it stops. 6: Remove the added load. 7: Select a drive of higher power class.
Err03	Overcurrent during deceleration	1.The output circuit is short circuited. 2.The deceleration time is too short. 3.The power supply is too low. 4.A sudden load is added during deceleration. 5.The braking resistor is not installed.	1: Eliminate short circuit. 2: Increase the deceleration time. 3: Check the power supply, and ensure it is normal. 4: Remove the added load. 5: Install the braking resistor.
Err04	Overcurrent at constant speed	1.The output circuit is short circuited. 2.The power supply is too low. 3.A sudden load is added during operation. 4.The AC drive model is of too small power class.	1: Eliminate short circuit. 2: Adjust power supply to normal range. 3: Remove the added load. 4: Select a drive of higher power class.

Display	Fault Name	Possible Causes	Solutions
Err05	Overcurrent during acceleration	1.The DC bus voltage is too high. 2.An external force drives the motor during acceleration. 3.The acceleration time is too short. 4.The braking resistor is not installed.	1: Replace with a proper braking resistor. 2: Cancel the external force or install braking resistor. 3: Increase the acceleration time. 4: Install a braking resistor.
Err06	Overcurrent during deceleration	1.The DC bus voltage is too high. 2.An external force drives the motor during deceleration. 3.The deceleration time is too short. 4.The braking resistor is not installed.	1: Replace with a proper braking resistor. 2: Cancel the external force or install braking resistor. 3: Increase the deceleration time. 4: Install the braking resistor.
Err07	Overvoltage at constant speed	1.The DC bus voltage is too high. 2.An external force drives the motor during deceleration.	1: Replace with a proper braking resistor. 2: Cancel the external force.

Voltage thresholds

Voltage Class	DC Bus Overvoltage	DC Bus Undervoltage	Braking Unit Operation Level
Single-phase 220 V	400V	200V	381V
Three-phase 220 V	400V	200V	381V
Three-phase 380 V	810V	350V	700V

Err08	Control power fault	The input voltage exceeds the allowed range.	Adjust the input voltage to within the allowed range.
Err09	Undervoltage	1.Instantaneous power failure occurs. 2.The input voltage exceeds the allowed range 3.The DC bus voltage is too low.	1: Reset the fault. 2: Adjust the input voltage to within the allowed range. 3 to 6: Seek for maintenance.

Display	Fault	Possible Causes	Solutions
Err09	Undervoltage	4.The rectifier bridge and buffer resistor are faulty. 5.The drive board is faulty. 6.The control board is faulty.	
Err10	Drive overload	1.The load is too heavy or the rotor is locked. 2.The drive is of too small power class.	1: Reduce the load, or check the motor, or check the machine whether it is locking the rotor. 2: Select a drive of higher power class.
Err11	Motor overload	1.P9-01 is too small. 2.The load is too heavy or the rotor is locked. 3.The drive is of too small power class.	1: Set P9-01 correctly. 2: Reduce the load, or check the motor, or check the machine whether it is locking the rotor. 3: Select a drive of larger power class.
Err12	Power input phase loss	1.The three-phase power supply is abnormal. 2.The drive board is faulty. 3.The lightening protection board is faulty. 4.The control board is faulty.	1: Check the power supply. 2 to 4: Seek for maintenance.
Err13	Power output phase loss	1.The cable between drive and motor is faulty. 2.The drive's three-phase output is unbalanced when the motor is running. 3.The drive board is faulty 4.The IGBT is faulty.	1: Check the cable. 2: Check the motor windings. 3 to 4: Seek for maintenance.
Err14	IGBT overheat	1.The ambient temperature is too high. 2.The air filter is blocked. 3.The cooling fan is damaged. 4.The thermal sensor of IGBT is damaged. 5.The IGBT is damaged.	1: Reduce the ambient temperature. 2: Clean the air filter. 3 to 5: Seek for maintenance.

Display	Fault Name	Possible Causes	Solutions
Err15	External equipment fault	1.External fault signal is input via DI. 2.External fault signal is input via VDI.	Reset the fault.
Err16	Communication fault	1.The host computer is abnormal. 2.The communication cable is faulty. 3.The extension card type set in P0-28 is incorrect. 4.The communication parameters in group PD are set improperly.	1: Check cabling of the host computer. 2: Check the communication cabling. 3: Set P0-28 correctly. 4: Set the communication parameters properly.
Err18	Current detection fault	The drive board is faulty.	Replace the drive board.
Err19	Motor tuning fault	1.Motor parameters are wrong. 2.Motor tuning overtime.	1.Check motor parameters P1-00 to P1-05. 2.Check the wiring between drive and motor.
Err21	EEPROM read-write fault	The EEPROM chip is damaged.	Replace the main control board.
Err23	Short circuit to ground	The motor is short-circuited to ground.	Replace the cables or motor.
Err26	Accumulative running time reached	The accumulative running time reaches the setting of P8-17.	Clear the record by performing parameter initialization (set PP-01 to 2).
Err27	User-defined fault 1	1.The user-defined fault 1 signal is input via DI. 2.User-defined fault 1 signal is input via VDI.	Reset the fault.
Err28	User-defined fault 2	1.The user-defined fault 2 signal is input via DI 2.The user-defined fault 2 signal is input via VDI.	Reset the fault.

Display	Fault Name	Possible Causes	Solutions
Err29	Accumulative power-on time reached	The accumulative power-on time reaches the setting of P8-16.	Clear the record by performing parameter initialization (set PP-01 to 2).
Err30	Off load fault	Offload when it's running.	Check the connection between motor and load.
Err31	PID feedback lost during running	The PID feedback is lower than PA-26.	Check the PID feedback signal or set PA-26 to a proper value.
Err33	Communication receiving timeout inside drive board	1.Wirings become loose inside the AC drive 2.The drive board is abnormal. 3.The control board is abnormal.	1. Connect all wirings securely. 2 and 3. Seek for maintenance.
Err40	Quick current limit	1.The load is too heavy or the rotor is locked. 2.The drive is of too small power class.	1: Reduce the load, or check the motor, or check the machine whether it is locking the rotor. 2: Select a drive of higher power class.
Err41	Motor switchover fault during running	The current motor is switched over via a terminal during running of the AC drive.	Switch over the motor only after the AC drive stops.
Err42	Overspeed error	1.Locked-rotor occurs on the motor. 2.P9-69 and P9-70 are set improperly. 3.Wirings between the AC drive and motor are abnormal.	1.Check whether the machine is abnormal, whether motor auto-tuning is not performed, and whether the setting of P2-10 is small. 2.Set P9-69 and P9-70 properly. 3.Check whether wirings between the AC drive and motor break. If yes, reconnect the wirings securely.

Display	Fault Name	Possible Causes	Solutions
Err96	Communication receiving timeout inside control board	1.Wirings become loose inside the AC drive 2.The drive board is abnormal. 3.The control board is abnormal.	1. Connect all wirings securely. 2 and 3. Seek for maintenance.

5.2 Common Symptoms And Diagnostics

Fault Name	Possible Causes	Solutions
There is no display at power-on.	1.There is no power supply or the power supply is too low. 2.The switching power supply on the drive board is faulty. 3.The rectifier bridge is damaged. 4.The buffer resistor of the drive is damaged. 5.The control board or the keypad is faulty. 6.The cable between the control board and the drive board or keypad breaks.	1: Check the power supply. 2 to 5: Seek for maintenance. 6: Re-connect the 4-core and 28-core flat cables, or seek for maintenance.
"HC" is displayed at power-on.	1.The cable between the drive board and the control board is in poor contact. 2.The control board is damaged. 3.The motor winding or the motor cable is short-circuited to the ground. 4.The power supply is too low.	1: Re-connect the 4-core and 28-core flat cables, or seek for maintenance. 2: Seek for maintenance. 3: Check the motor or replace it, and check the motor cable. 4. Check the power supply according to charpter1.3.
"Err23n is displayed at power-on.	1.The motor or output cables are short circuited to ground. 2.The AC drive is damaged.	1.Measure insulation of the motor and output cables. 2.Seek for maintenance.

Fault Name	Possible Causes	Solutions
The display is normal upon power-on, but "HC" is displayed after startup and the motor stops immediately.	1.The cooling fan is damaged or the rotor is locked. 2.A certain terminal is short-circuited.	1: Replace cooling fan, or check the machine whether it is locking the rotor. 2: Eliminate short circuit.
Err14 is reported frequently.	1.The carrier frequency is set too high. 2.The cooling fan is damaged, or the air filter is blocked. 3.Components (thermal coupler or others) inside the drive are damaged.	1: Reduce P0-15. 2: Replace the fan and clean the air filter. 3: Seek for maintenance.
The motor does not rotate after the AC drive outputs a non¬zero reference.	1.The motor or motor cable is damaged. 2.The motor parameters are set improperly. 3.The cable between the drive board and the control board is in poor contact. 4.The drive board is faulty. 5.The rotor is locked.	1: Check the motor, or check the cable between the drive and the motor. 2: Check and re-set motor parameters. 3: Re-connect the 4-core and 28-core flat cables, or seek for maintenance. 4: Seek for maintenance. 5: Check the machine whether it is locking the rotor.
The DI terminals are disabled.	1.The DI parameters are set incorrectly. 2.The input signal is incorrect. 3.The wire jumper between OP and +24V is in poor contact. 4.The control board is faulty.	1: Check and reset DI parameters in group P4. 2: Check the input signals, or check the input cable. 3: Check the jumper between OP and +24 V. 4: Seek for maintenance.

Fault Name	Possible Causes	Solutions
The drive reports overcurrent and overvoltage frequently.	1.The motor parameters are set improperly. 2.The acceleration/deceleration time is too small. 3.The load fluctuates.	1: Reset motor parameters. 2: Set proper acceleration/ deceleration time. 3: Check the machine, or seek for maintenance.
Err17 is reported at power-on or during running.	The soft start contactor is not closed.	1.Check whether the contactor wiring becomes loose 2.Check whether the contactor is faulty. 3.Check whether 24 V power supply of the contactor is faulty. 4.Seek for maintenance
Display at power-on	Related device on the control board is damaged.	Seek for maintenance.
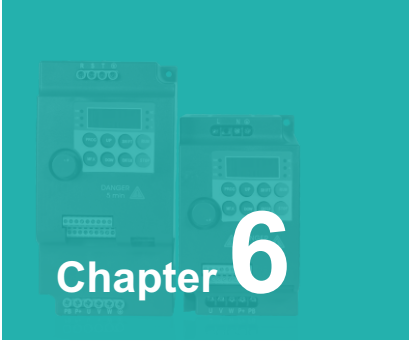
Parameter Table

6.1 General Parameters

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
Group P0: Standard Parameters					
P0-01	Motor 1 control mode	0: Sensorless vector control (SVC) 2: Voltage/Frequency control (V/F)	N.A	2	
P0-02	Command source selection	0 to 2	N.A	0	
P0-03	Main frequency source X selection	0 to 9	N.A	0	
P0-04	Range base of auxiliary frequency Y for X and Y operation superposition	The same as P0-03 (Main frequency source X selection)	N.A	0	
P0-05	Range of auxiliary frequency Y for X and Y operation superposition	0: Relative to max. frequency 1: Relative to main frequency X	N.A	0	
P0-06	Range of auxiliary frequency Y for X and Y operation superposition	0 to150	%	100	
P0-07	Frequency source superposition selection	00 to 34	N.A	00	
P0-08	Preset frequency	0.00 to max frequency (P0-10)	N.A	50.00	
P0-09	Rotation direction	0: Same direction 1: Reverse direction	N.A	0	
P0-10	Max. frequency	50.00 to 600.00	Hz	50.00	
P0-11	Source of frequency upper limit	0 to 5	N.A	0	
P0-12	Frequency upper limit	Frequency lower limit (P0-14) to max. frequency (P0-10)	Hz	50.00	
P0-13	Frequency upper limit offset	0.00 to max frequency (P0-10)	Hz	0.00	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P0-14	Frequency lower limit	0.00 to frequency upper limit (P0-12)	Hz	0.00	
P0-15	Carrier frequency	0.8 to 16.0	kHz	Model dependent	
P0-16	Carrier frequency adjustment with temperature	0: No 1: Yes	N.A	1	
P0-17	Acceleration time 1	0.00 to 650.00 (if P0-19 = 2) 0.0 to 6500.0 (if P0-19 = 1) 0 to 65000 (if P0-19 = 0)	s	Model dependent	
P0-18	Deceleration time 1	0.00 to 650.00 (if P0-19 = 2) 0.0 to 6500.0 (if P0-19 = 1) 0 to 65000 (if P0-19 = 0)	s	Model dependent	
P0-19	Acceleration/ Deceleration time unit	0: 1 1: 0.1 2: 0.01	s	1	
P0-21	Frequency offset of auxiliary frequency source for X and Y operation superposition	0.00 to max frequency (P0-10)	Hz	0.00	
P0-22	Reserved	–	–	–	
P0-23	Retentive of digital setting frequency upon stop	0: Not retentive 1: Retentive	N.A	0	
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	N.A	0	
P0-25	Acceleration/ Deceleration time base frequency	0: Max. frequency (P0-10) 1: Frequency reference 2: 100	Hz	0	
P0-26	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Frequency reference	N.A	0	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
P0-27	Binding command source to frequency source	0000 to 9999	N.A	0000	
Group P1: Motor 1 Parameters					
P1-00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	N.A.	0	
P1-01	Rated motor power	0.1 to 30.0	kW	Model dependent	
P1-02	Rated motor voltage	1 to 1000	V	Model dependent	
P1-03	Rated motor current	0.01 to 655.35	A	Model dependent	
P1-04	Rated motor frequency	0.01 to max frequency	Hz	Model dependent	
P1-05	Rated motor speed	1 to 65535	RPM	Model dependent	
P1-06	Stator resistance (asynchronous motor)	0.001 to 65.535	Q	Model dependent	
P1-07	Rotor resistance	0.001 to 65.535	Q	Model dependent	
P1-08	Leakage inductive reactance	0.01 to 655.35	mH	Model dependent	
P1-09	Mutual inductive reactance	0.1 to 6553.5	mH	Model dependent	
P1-10	No-load current (asynchronous motor)	0.1 to 6553.	A	Model dependent	
P1-37	Auto-tuning selection	0: No auto-tuning 1: Static auto-tuning 1 2: Complete dynamic auto-tuning 3: Static auto-tuning 2	N.A.	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
Group P2: Vector Control					
P2-00	Speed loop proportional gain 1	1 to 100	N.A.	30	
P2-01	Speed loop integral time 1	0.01 to 10.00	s	0.50	
P2-02	Switchover frequency 1	0.00 to P2-05	Hz	5.00	
P2-03	Speed loop proportional gain 2	1 to100	Hz	20	
P2-04	Speed loop integral time 2	0.01 to10.00s	s	1.00	
P2-06	Vector control slip gain	50 to 200	%	100	
P2-07	Time constant of speed loop filter	0.000 to 1.000	s	0.050	
P2-08	Vector control over-excitation gain	0 to 200	N.A.	0	
P2-09	Torque upper limit source in speed control mode	0 to 7	N.A.	0	
P2-10	Digital setting of torque upper limit in speed control mode	0.0 to 200.0	%	150.0	
P2-11	Selection of torque upper limit reference setting channel in speed control mode (regenerative)	0 to 8	N.A.	0	
P2-12	Digital setting of torque upper limit in speed control mode (regenerative)	0.0 to 200.0	%	150.0	
P2-13	Excitation adjustment proportional gain	0 to 60000	N.A.	10	
P2-14	Excitation adjustment integral gain	0 to 60000	N.A.	10	
P2-15	Torque adjustment proportional gain	0 to 60000	N.A.	10	
P2-16	Torque adjustment integral gain	0 to 60000	N.A.	10	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P2-17	Speed loop property	00 to 11	N.A	80	
P2-18	Torque feedforward gain	20 to 100	N.A	80	
P2-21	Max. torque coefficient of field weakening area	50 to 200	%	80	
P2-22	Regenerative power limit	0.0: not limited 0.1 to 200.0	%	0.0	
Group P3: V/F Control					
P3-00	V/F curve setting	0 to 9	N.A.	0	
P3-01	Torque boost	0.0 to 30.0	%	0.0	
P3-02	Cut-off frequency of torque boost	0.00 to max output frequency	Hz	50.00	
P3-03	Multi-point V/F frequency 1 (P1)	0.00 to P3-05	Hz	0.00	
P3-04	Multi-point V/F voltage 1	0.0 to 100.0	%	0.0	
P3-05	Multi-point V/F frequency 2	P3-03 to P3-07	Hz	0.00	
P3-06	Multi-point V/F voltage 2	0.0 to 100.0	%	0.0	
P3-07	Multi-point V/F frequency 3	P3-05 to rated motor frequency (P1-04)	Hz	0.00	
P3-08	Multi-point V/F voltage 3	0.0 to 100.0	%	0.0	
P3-09	V/F slip compensation gain	0 to 200.0	%	0.0	
P3-10	V/F over-excitation gain	0 to 200	%	64	
P3-11	V/F oscillation suppression gain	0 to 100	%	Model dependent	
P3-12	Oscillation suppression mode selection	0 to 4	N.A.	3	
P3-13	Voltage source for V/ F separation	0 to 8	N.A.	0	
P3-14	Voltage digital setting for V/F separation	0 to rated motor voltage	V	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P3-15	Voltage rise time of V/F separation	0.0 to 1000.0	s	0.0	
P3-16	Voltage decline time of V/F separation	0.0 to 1000.0	s	0.0	
P3-17	Stop mode selection for V/F separation	0: Frequency and voltage declining to 0 independently 1: Frequency declining after voltage declining to 0	N.A.	0	
P3-18	Current limit level	50 to 200	%	150	
P3-19	Current limit selection	0 to 100	N.A.	0.0	
P3-20	Current limit gain	0 to 200	N.A.	0.0	
P3-21	Compensation factor of speed multiplying current limit level	200.0 to 810.0	%	0	
P3-22	Voltage limit	200.0 to 810.0	V	760.0	
P3-23	Voltage limit selection	0: Disabled 1: Enabled	N.A.	1	
P3-24	Frequency gain for voltage limit	0 to 100	N.A.	30	
P3-25	Voltage gain for voltage limit	0 to 100	N.A.	30	
P3-26	Frequency rise threshold during voltage limit	0 to 50	Hz	5	
P3-27	Slip compensation time constant	0.1 to 10.0	s	0.5	
Group P4: Input Terminals					
P4-00	DI1 function selection	0 to 59	N.A.	1	
P4-01	DI2 function selection	0 to 59	N.A	4	
P4-02	DI3 function selection	0 to 59	N.A	9	
P4-03	DI4 function selection	0 to 59	N.A	12	

Chapter 6
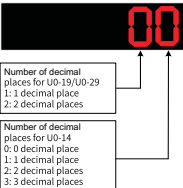
Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P4-04	DI5 function selection	0 to 59	N.A	13	
P4-05	DI6 function selection	0 to 59	N.A	0	
P4-06	DI7 function selection	0 to 59	N.A	0	
P4-07	DI8 function selection	0 to 59	N.A	0	
P4-08	DI9 function selection	0 to 59	N.A	0	
P4-09	DI10 function selection	0 to 59	N.A	0	
P4-10	DI filter time	0.000 to 1.000	s	0.010	
P4-11	Terminal command mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	N.A	0	
P4-12	Terminal UP/DOWN rate	0.01 to 65.535	Hz/s	1.000	
P4-13	AI curve 1 minimum input	0.00 to P4-15	V	0.00	
P4-14	Corresponding setting of AI curve1 minimum input	-100.0 to100.0	%	0.0	
P4-15	AI curve 1 max input	P4-13 to 10.00	V	10.00	
P4-16	Corresponding setting of AI curve1 max input	-100.0 to 100.0	%	100.0	
P4-17	Ai1 filter time	0.00 to 10.00	s	0.10	
P4-18	AI curve 2 minimum input	0.00 to P4-20	V	0.00	
P4-19	Corresponding setting of AI curve2 minimum input	-100.0 to 100.0	%	0.0	
P4-20	AI curve 2 max input	P4-18 to 10.00	V	10.00	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P4-21	Corresponding setting of AI curve2 max input	-100.0 to 100.0	%	100.0	
P4-22	AI2 filter time	0.00 to 10.00	s	0.10	
P4-23	AI curve 3 minimum input	-10.00 to P4-25	V	-10.00	
P4-24	Corresponding setting of AI curve3 minimum input	-100.0 to100.0	%	-100.0	
P4-25	AI curve 3 max input	P4-23 to 10.00	V	10.00	
P4-26	Corresponding setting of AI curve3 max input	-100.0 to 100.0	%	100.0	
P4-27	AI3 filter time	0.00 to10.00	s	0.10	
P4-28	Pulse minimum input	0.00 to P4-30	KHz	0.00	
P4-29	Corresponding setting of pulse minimum input	-100.0 to 100.0	%	0.0	
P4-30	Pulse max input	P4-28 to 20.00	KHz	20.00	
P4-31	Corresponding setting of pulse max input	-100.0 to 100.0	%	100.0	
P4-32	Pulse filter time	0.00 to 10.00	s	0.10	
P4-33	AI curve selection	111 to 555	N.A.	321	
P4-34	Setting for AI less than minimum input	000 to 111	N.A.	000	
P4-35	DI1 delay time	0.0 to 3600.0	s	0.0	
P4-36	DI2 delay time	0.0 to 3600.0	s	0.0	
P4-37	DI3 delay time	0.0 to 3600.0	s	0.0	
P4-38	DI active mode selection 1	00000 to 11111	N.A.	00000	
P4-39	DI active mode selection 2	00000 to 11111	N.A.	00000	
Group P5: Output Terminals					
P5-00	FM terminal output mode	0 to 1	N.A.	0	
P5-01	FMR function (open-collector output terminal) selection	0 to 41	N.A.	0	
P5-02	Relay function (T/A-T/B-T/C) selection	0 to 41	N.A.	2	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
P5-03	Extension card relay function (P/ A-P/B-P/C) selection	0 to 41	N.A	0	
P5-04	DO1 function selection (open-collector output terminal)	0 to 41	N.A	1	
P5-05	Extension card DO2 function selection	0 to 41	N.A	4	
P5-06	FMP function selection	0 to 16	N.A	0	
P5-07	AO1 function selection	0 to 16	N.A	0	
P5-08	AO2 function selection	0 to 16	N.A	1	
P5-09	Max. FMP output frequency	0.01 to 50.00	KHz	50.00	
P5-10	AO1 zero offset coefficient	-100.0 to 100.0	%	0.0	
P5-11	AO1 gain	-10.00 to10.00	N.A	1.00	
P5-12	AO2 zero offset coefficient	-100.0 to +100.0	%	0.00	
P5-13	AO2 gain	-10.00 to +10.00	N.A	1.00	
P5-17	FMR output delay time	0.0 to 3600.0	s	0.0	
P5-18	Relay 1 output delay time	0.0 to 3600.0	s	0.0	
P5-19	Relay 2 output delay time	0.0 to 3600.0	s	0.0	
P5-20	DO1 output delay time	0.0 to 3600.0	s	0.0	
P5-21	DO2 output delay time	0.0 to 3600.0	s	0.0	
P5-22	DO active mode selection	00000 to 11111	N.A	00000	
Group P6: Start/Stop Control					
P6-00	Start mode	0: Direct startup 1: Reserved 2: Pre-excited startup (asynchronous motor)	N.A	0	
P6-01	Mode of catching a spinning motor	0: From stop frequency 1: From zero speed 2: From max. frequency	N.A	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P6-02	Speed of catching a spinning motor	1 to 100	N.A.	20	
P6-03	Startup frequency	0.00 to 10.00	Hz	0.00	
P6-04	Startup frequency active time	0.0 to 100.0	s	0.0	
P6-05	DC injection braking 1 level/Pre-excitation level	0 to 100	%	50	
P6-06	DC injection braking 1 active time/Pre-excitation active time	0.0 to 100.0	s	0.0	
P6-07	Acceleration/ Deceleration mode	0: Linear mode 1: S-curve mode A 2: S-curve mode B	N.A.	0	
P6-08	Time proportion of S-curve start segment	0.0 to (100.0 minus P6-09)	%	30.0	
P6-09	Time proportion of S-curve end segment	0.0 to (100.0 minus P6-09)	%	30.0	
P6-10	Stop mode	0: Decelerate to stop 1: Coast to stop	N.A.	0	
P6-11	DC injection braking 2 frequency threshold	0.00 to 10.00	Hz	0.00	
P6-12	DC injection braking 2 delay time	0.0 to 100.0	s	0.0	
P6-13	DC injection braking 2 level	0 to 100	%	50	
P6-14	DC injection braking 2 active time	0.0 to 100.0	s	0.0	
P6-15	Reserved	—	—		
P6-18	Catching a spinning motor current limit	30 to 200	%	Model dependent	
P6-21	Demagnetization time	0.00 to 5.00	s	Model dependent	
P6-22	Min. output frequency	0.00 to P6-11	Hz	0.00	
P6-23	Factory reserved	1 to 100	N.A.	10	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
Group P7: Keypad Control And LED Display					
P7-01	MF.K Key function selection	0 to 5	N.A.	5	
P7-02	STOP/RESET key function	0 to 1	N.A.	1	
P7-03	LED display running parameters 1	0000 to FFFF	N.A.	1F	
P7-04	LED display running parameters 2	0000 to FFFF	N.A.	0	
P7-05	LED display stop parameters	0000 to FFFF	N.A.	33	
P7-06	Load speed display coefficient	0.0001 to 6.5000	N.A.	1.0000	
P7-07	Heatsink temperature of AC drive IGBT	0 to 100	°C		
P7-08	Product number	N.A.	N.A.	N.A.	
P7-09	Accumulative running time	0 to 65535	h	N.A.	
P7-10	Performance software version	N.A.	N.A.	N.A.	
P7-11	Functional software version	N.A.	N.A.	N.A.	
P7-12	Number of decimal places for load speed display	Number of decimal places for U0-19/U0-29 1: 1 decimal place 2: 2 decimal places	Number of decimal places for U0-14 0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places		21	
P7-13	Accumulative power- on time	0 to 65535	h	N.A.	
P7-14	Accumulative power consumption	0 to 65535	kWh	N.A.	
P7-15	Temporary performance software version	N.A.	N.A.	N.A.	
P7-16	Temporary functional software version	N.A.	N.A.	N.A.	
Group P8: Auxiliary Functions					
P8-00	JOG running frequency	0.00 to max frequency	Hz	2.00	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
P8-01	JOG acceleration time	0.0 to 6500.0	s	20.00	
P8-02	JOG deceleration time	0.0 to 6500.0	s	20.00	
P8-03	Acceleration time 2	0.0 to 6500.0	s	Model dependent	
P8-04	Deceleration time 2	0.0 to 6500.0	s	Model dependent	
P8-05	Acceleration time 3	0.0 to 6500.0	s	Model dependent	
P8-06	Deceleration time 3	0.0 to 6500.0	s	Model dependent	
P8-07	Acceleration time 4	0.0 to 500.0	s	Model dependent	
P8-08	Deceleration time 4	0.0 to 6500.0	s	Model dependent	
P8-09	Frequency jump 1	0.00 to max frequency	Hz	0.00	
P8-10	Frequency jump 2	0.00 to max frequency	Hz	0.00	
P8-11	Frequency jump amplitude	0.00 to max frequency	Hz	0.00	
P8-12	Forward/Reverse rotation dead-zone time	0.0 to 3000.0	s	0.0	
P8-13	Reverse control	0: Enabled 1: Disabled	N.A.	0	
P8-14	Running mode when set frequency lower than frequency lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	N.A.	0	
P8-15	Droop control	0.00 to 10.00	Hz	0.00	
P8-16	Accumulative power-on time threshold	0 to 65000	h	0	
P8-17	Accumulative running time threshold	0 to 65000	h	0	
P8-18	Startup protection	0: No 1: Yes	N.A.	0	
P8-19	Frequency detection value (FDT1)	0.00 to max frequency	Hz	50.0	
P8-20	Frequency detection hysteresis (FDT1 hysteresis)	0.0 to 100.0 (FDT1 level)	%	5.0	
P8-21	Detection range of frequency reached	0.00 to 100 (max frequency)	%	0.0	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P8-22	Jump frequency during acceleration/deceleration	0: Disabled 1: Enabled	N.A.	1	
P8-25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00 to max frequency	Hz	0.00	
P8-26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00 to max frequency	Hz	0.00	
P8-27	Terminal JOG priority	0: Disabled 1: Enabled	N.A.	0	
P8-28	Frequency detection value (FDT2)	0.00 to max frequency	N.A.	50.00	
P8-29	Frequency detection hysteresis (FDT2 hysteresis)	0.0 to 100.0 (FDT2 level)	%	5.0	
P8-30	Detection value 1 of any frequency reaching	0.00 to max frequency	Hz	50.00	
P8-31	Detection amplitude 1 of any frequency reaching	0.0 to 100.0 (max frequency)	%	0.0	
P8-32	Detection value 2 of any frequency reaching	0.00 to max frequency	Hz	50.00	
P8-33	Detection amplitude 2 of any frequency reaching	0.0 to 100.0 (max frequency)	%	0.0	
P8-34	Zero current detection level	0.0 to 300.0 (rated motor current as 100%)	%	5.0	
P8-35	Zero current detection delay	0.01 to 600.00	s	0.10	
P8-36	Output overcurrent threshold	0.0 (no detection) 0.1 to 300.0 (rated motor current)	%	200.0	
P8-37	Output overcurrent detection delay	0.00 to 600.00	s	0.0	
P8-38	Detection value 1 of any current reached	0.0 to 300.0 (rated motor current)	%	100.0	
P8-39	Detection amplitude 1 of any current reached	0.0 to 300.0 (rated motor current)	%	0.0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P8-40	Detection value 2 of any current reached	0.0 to 300.0 (rated motor current)	%	100.0	
P8-41	Detection amplitude 2 of any current reached	0.0 to 300.0 (rated motor current)	%	0.0	
P8-42	Timing function	0: Disabled 1: Enabled	N.A.	0	
P8-43	Timing duration source	0 to 3	N.A.	0	
P8-44	Timing duration	0.0 to 6500.0	min	0.0	
P8-45	Ai1 input voltage lower limit	0 to P8-46	V	3.10	
P8-46	Ai1 input voltage upper limit	P8-45 to 11.00	V	6.80	
P8-47	IGBT temperature threshold	0 to 100	°C	75	
P8-48	Cooling fan working mode	0: Fan working during running 1: Fan working continuously	N.A.	0	
P8-49	Wakeup frequency	Dormant frequency (P8-51) to max frequency (P0-10)	Hz	0.00	
P8-50	Wakeup delay	0.0 to 6500.0	s	0.0	
P8-51	Hibernating frequency	0.00 to wakeup frequency (P8-49)	Hz	0.00	
P8-52	Hibernating delay	0.0 to 6500.0	s	0.0	
P8-53	Current running time reached	0.0 to 6500.0	min	0.0	
P8-54	Output power correction coefficient	0.0 to 200.0	%	100.0	
P8-55	Deceleration time for emergency stop	0.00 to 650.00 (P0-19 =2) 0.0 to 6500.0 (P0-19 =1) 0 to 65000 (P0-19 = 0)	s	0.1	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
Group P9: Fault And Protection					
P9-00	Motor overload protection	0: Disabled 1: Enabled	N.A.	1	
P9-01	Motor overload protection gain	0.20 to 10.00	N.A.	1.00	
P9-02	Motor overload pre-warning coefficient	50 to 100	%	80	
P9-07	Short-circuit to ground upon power-on	0: Disabled 1: Enabled	N.A.	1	
P9-08	Braking unit applied voltage	650.0 to 810.0	V	380 V: 700 V	
P9-09	Auto reset times	0 to 20	N.A.	0	
P9-10	DO action during fault auto reset	0: Not act 1: Act	N.A.	0	
P9-11	Delay of fault auto reset	0.1 to 100.0	s	1.0	
P9-12	Power input phase loss protection	0: Disabled 1: Enabled	N.A.	0	
P9-13	Power output phase loss protection	Units position: Output phase loss protection 0: Disabled 1: Enabled Tens position: Output phase loss protection before running 0: Disabled 1: Enabled	N.A.	01	
P9-14	1st fault type	0 to 96	N.A.	N.A.	
P9-15	2nd fault type	0 to 96	N.A.	N.A.	
P9-16	3rd (latest) fault type	0 to 96	N.A.	N.A.	
P9-17	Frequency upon 3rd fault	N.A.	N.A.	N.A.	
P9-18	Current upon 3rd fault	N.A.	N.A.	N.A.	
P9-19	Bus voltage upon 3rd fault	N.A.	N.A.	N.A.	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P9-20	Input terminal status upon 3rd fault	N.A.	N.A.	N.A.	
P9-21	Output terminal status upon 3rd fault	N.A.	N.A.	N.A.	
P9-22	AC drive status upon 3rd fault	N.A.	N.A.	N.A.	
P9-23	Power-on time upon 3rd fault	N.A.	N.A.	N.A.	
P9-24	Running time upon 3rd fault	N.A.	N.A.	N.A.	
P9-27	Frequency upon 2nd fault	N.A.	N.A.	N.A.	
P9-28	Current upon 2nd fault	N.A.	N.A.	N.A.	
P9-29	Bus voltage upon 2nd fault	N.A.	N.A.	N.A.	
P9-30	Input terminal status upon 2nd fault	N.A.	N.A.	N.A.	
P9-31	Output terminal status upon 2nd fault	N.A.	N.A.	N.A.	
P9-32	Frequency upon 2nd fault	N.A.	N.A.	N.A.	
P9-33	Current upon 2nd fault	N.A.	N.A.	N.A.	
P9-34	Bus voltage upon 2nd fault	N.A.	N.A.	N.A.	
P9-37	Input terminal status upon 1st fault	N.A.	N.A.	N.A.	
P9-38	Output terminal status upon 1st fault	N.A.	N.A.	N.A.	
P9-39	Frequency upon 1st fault	N.A.	N.A.	N.A.	
P9-40	Current upon 1st fault	N.A.	N.A.	N.A.	
P9-41	Bus voltage upon 3rd fault	N.A.	N.A.	N.A.	
P9-42	Input terminal status upon 1st fault	N.A.	N.A.	N.A.	
P9-43	Output terminal status upon 1st fault	N.A.	N.A.	N.A.	
P9-44	Frequency upon 1st fault	N.A.	N.A.	N.A.	
P9-47	Fault protection action selection 1	00000 to 22222	N.A.	0000	
P9-48	Fault protection action selection 2	00000 to 21111	N.A.	0000	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
P9-49	Fault protection action selection 3	00000 to 22222	N.A.	0000	
P9-54	Frequency selection for continuing to run upon fault	0 to 4	N.A.	0	
P9-55	Backup frequency upon abnormality	0.0 to 100.0 (max frequency)	Hz	100.0	
P9-59	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	N.A.	0	
P9-60	Pause judging voltage at instantaneous power failure	80 to 100	%	85	
P9-61	Voltage recovery judging time at instantaneous power failure	0.0 to 100.0	s	0.5	
P9-62	Judging voltage at instantaneous power failure	60 to P9-60 (standard bus voltage)	%	80	
P9-63	Protection upon load lost	0: Disabled 1: Enabled	N.A.	0	
P9-64	Load lost detection level	0.0 to 100.0	%	10.0	
P9-65	Load lost detection time	0.0 to 60.0	s	1.0	
P9-66	Min. PID error 2	0.0 to 100.0	%	0.0	
P9-69	Overspeed detection level	0.0 to 50.0 (max. output frequency)	%	20.0	
P9-70	Overspeed detection time	0.0: No detection 0.1 to 60.0	s	0.0	
P9-71	Power dip ride-through gain Kp	0 to 100	N.A.	40	
P9-72	Power dip ride-through integral coefficient	0 to 100	N.A.	30	
P9-73	Deceleration time of power dip ride-through	0.0 to 300.0	s	20.0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
Group PA: Process Control And PID Function					
PA-00	PID reference source	0 to 6	N.A	0	
PA-01	PID digital reference	0.0 to 100.0	%	50.0	
PA-02	PID feedback source	0 to 8	N.A	0	
PA-03	PID action direction	0: Forward action 1: Reverse action	N.A	0	
PA-04	PID setting feedback range	0 to 65535	N.A	1000	
PA-05	Proportional gainKp1	0.0 to 100.0	N.A	20.0	
PA-06	Integral time Ti1	0.01 to 10.00	s	2.00	
PA-07	Differential time Td1	0.000 to 10.000	s	0.000	
PA-08	Cut-off frequency of PID reverse rotation	0.000 to max frequency	Hz	2.00	
PA-09	PID deviation limit	0.0 to 100.0	%	0.0	
PA-10	PID differential limit	0.00 to 100.00	%	0.10	
PA-11	PID setting change time	0.00 to 650.00	s	0.00	
PA-12	PID feedback filter time	0.00 to 60.00	s	0.00	
PA-13	PID output filter time	0.00 to 60.00	s	0.00	
PA-14	Min. PID operation frequency	0.00 to 10.00	Hz	0.00	
PA-15	Proportional gain Kp2	0.0 to 100.0	N.A.	20.0	
PA-16	Integral time Ti2	0.01 to 10.00	s	2.00	
PA-17	Differential time Td2	0.000 to 10.000	s	0.000	
PA-18	PID parameter switchover condition	0 to 3	N.A.	0	
PA-19	PID parameter switchover deviation 1	0.0 to PA-20	%	20.0	
PA-20	PID parameter switchover deviation 2	PA-19 to 100.0	%	80.0	
PA-21	PID initial value	0.0 to 100.0	%	0.0	
PA-22	PID initial value holding time	0.00 to 650.00	s	0.00	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
PA-23	Max. deviation between two PID outputs in forward direction	0.00 to 100.00	%	1.00	
PA-24	Max. deviation between two PID outputs in reverse direction	0.00 to 100.00	%	1.00	
PA-25	PID integral property	00 to 11	N.A.	00	
PA-26	Detection value of PID feedback loss	0.0: Not judging feedback loss 0.1 to 100.0	%	0.0	
PA-27	Detection time of PID feedback loss	0.0 to 20.0	s	1.00	
PA-28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	N.A.	0	
Group PB: Wobble Frequency, Fixed Length And Count					
PB-00	Wobble setting mode	0: Relative to the central frequency 1: Relative to the max frequency	N.A.	0	
PB-01	Wobble frequency amplitude	0.0 to 100.0	%	0.0	
PB-02	Wobble step	0.0 to 50.0	%	0.0	
PB-03	Wobble cycle	0.1 to 3000.0	s	10.0	
PB-04	Triangular wave rising time coefficient	0.0 to 100.0	%	50.0	
PB-05	Set length	0 to 65535	m	1000	
PB-06	Actual length	0 to 65535	m		
PB-07	Number of pulses per meter	0.1 to 6553.5	N.A.	100.0	
PB-08	Set count value	0 to 65535	N.A.	1000	
PB-09	Designated count value	0 to 65535	N.A.	1000	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
Group PC: Multi-Reference And Simple PLC Function					
PC-00	Reference 0	-100.0 to 100.0	%	0.0	
PC-01	Reference 1	-100.0 to 100.0	%	0.0	
PC-02	Reference 2	-100.0 to 100.0	%	0.0	
PC-03	Reference 3	-100.0 to 100.0	%	0.0	
PC-04	Reference 4	-100.0 to 100.0	%	0.0	
PC-05	Reference 5	-100.0 to 100.0	%	0.0	
PC-06	Reference 6	-100.0 to 100.0	%	0.0	
PC-07	Reference 7	-100.0 to 100.0	%	0.0	
PC-08	Reference 8	-100.0 to 100.0	%	0.0	
PC-09	Reference 9	-100.0 to 100.0	%	0.0	
PC-10	Reference 10	-100.0 to 100.0	%	0.0	
PC-11	Reference 11	-100.0 to 100.0	%	0.0	
PC-12	Reference 12	-100.0 to 100.0	%	0.0	
PC-13	Reference 13	-100.0 to 100.0	%	0.0	
PC-14	Reference 14	-100.0 to 100.0	%	0.0	
PC-15	Reference 15	-100.0 to 100.0	%	0.0	
PC-16	Simple PLC running mode	0 to 2	N.A.	0	
PC-17	Simple PLC retentive selection	00 to 11	N.A.	00	
PC-18	Running time of simple PLC reference 0	0.0 to 6500.0	s or h	0.0	
PC-19	Acceleration/deceleration time of simple PLC reference 0	0 to 3	N.A.	0	
PC-20	Running time of simple PLC reference 1	0.0 to 6500.0	s or h	0.0	
PC-21	Acceleration/deceleration time of simple PLC reference 1	0 to 3	N.A.	0	
PC-22	Running time of simple PLC reference 2	0.0 to 6500.0	s or h	0.0	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
PC-23	Acceleration/deceleration time of simple PLC reference 2	0 to 3	N.A.	0	
PC-24	Running time of simple PLC reference 3	0.0 to 6500.0	s or h	0.0	
PC-25	Acceleration/deceleration time of simple PLC reference 3	0 to 3	N.A.	0	
PC-26	Running time of simple PLC reference 4	0.0 to 6500.0	s or h	0.0	
PC-27	Acceleration/deceleration time of simple PLC reference 4	0 to 3	N.A.	0	
PC-28	Running time of simple PLC reference 5	0.0 to 6500.0	s or h	0.0	
PC-29	Acceleration/deceleration time of simple PLC reference 5	0 to 3	N.A.	0	
PC-30	Running time of simple PLC reference 6	0.0 to 6500.0	s or h	0.0	
PC-31	Acceleration/deceleration time of simple PLC reference 6	0 to 3	N.A.	0	
PC-32	Running time of simple PLC reference 7	0.0 to 6500.0	s or h	0.0	
PC-33	Acceleration/deceleration time of simple PLC reference 7	0 to 3	N.A.	0	
PC-34	Running time of simple PLC reference 8	0.0 to 6500.0	s or h	0.0	
PC-35	Acceleration/deceleration time of simple PLC reference 8	0 to 3	N.A.	0	
PC-36	Running time of simple PLC reference 9	0.0 to 6500.0	s or h	0.0	
PC-37	Acceleration/deceleration time of simple PLC reference 9	0 to 3	N.A.	0	
PC-38	Running time of simple PLC reference 10	0.0 to 6500.0	s or h	0.0	
PC-39	Acceleration/deceleration time of simple PLC reference 10	0 to 3	N.A.	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
PC-40	Running time of simple PLC reference 11	0.0 to 6500.0	s or h	0.0	
PC-41	Acceleration/deceleration time of simple PLC reference 11	0 to 3	N.A.	0	
PC-42	Running time of simple PLC reference 12	0.0 to 6500.0	s or h	0.0	
PC-43	Acceleration/deceleration time of simple PLC reference 12	0 to 3	N.A.	0	
PC-44	Running time of simple PLC reference 13	0.0 to 6500.0	s or h	0.0	
PC-45	Acceleration/deceleration time of simple PLC reference 13	0 to 3	N.A.	0	
PC-46	Running time of simple PLC reference 14	0.0 to 6500.0	s or h	0.0	
PC-47	Acceleration/deceleration time of simple PLC reference 14	0 to 3	N.A.	0	
PC-48	Running time of simple PLC reference 15	0.0 to 6500.0	s or h	0.0	
PC-49	Acceleration/deceleration time of simple PLC reference 15	0 to 3	N.A.	0	
PC-50	Time unit of simple PLC running	0: s (second); 1: h (hour)	N.A.	0	
PC-51	Reference 0 source	0 to 6	N.A.	0	
Group PD: Communication					
PD-00	Baud rate	0000 to 9999	N.A.	5005	
PD-01	Data format symbol	0 to 3	N.A.	0	
PD-02	Local address	0: Broadcast address; 1 to 247	N.A.	1	
PD-03	Response delay	0 to 20	ms	2	
PD-04	Communication timeout	0.0 (invalid); 0.1 to 60.0	s	0.0	
PD-05	Communication protocol	30, 31	N.A.	31	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
PD-06	Current resolution read by communication	0: 0.01 1: 0.1	N.A.	0	
PD-07	Factory reserved	0: Background software invalid 1: Background software valid	A	0	
PD-08	Extension card communication timeout time	0.0: Invalid 0.1 to 60.0	N.A.	0	
Group PE: User-Defined Parameters					
PE-00	User-defined function code 0	P0-00 to PP-xx, A1-00 to Ax-xx, U0-xx to U0-xx	N.A.	P0-01	
PE-01	User-defined function code 1		N.A.	P0-02	
PE-02	User-defined function code 2		N.A.	P0-03	
PE-03	User-defined function code 3		N.A.	P0-07	
PE-04	User-defined function code 4		N.A.	P0-08	
PE-05	User-defined function code 5		N.A.	P0-17	
PE-06	User-defined function code 6		N.A.	P0-18	
PE-07	User-defined function code 7		N.A.	P3-00	
PE-08	User-defined function code 8		N.A.	P3-01	
PE-09	User-defined function code 9		N.A.	P4-00	
PE-10	User-defined function code 10		N.A.	P4-01	
PE-11	User-defined function code 11		N.A.	P4-02	
PE-12	User-defined function code 12		N.A.	P5-02	
PE-13	User-defined function code 13		N.A.	P5-07	
PE-14	User-defined function code 14		N.A.	P6-00	
PE-15	User-defined function code 15		N.A.	P6-10	
PE-16	User-defined function code 16		N.A.	P0-00	
PE-17	User-defined function code 17		N.A.	P0-00	
PE-18	User-defined function code 18		N.A.	P0-00	
PE-19	User-defined function code 19		N.A.	P0-00	

Para. No.	Para. Name		Setting Range	Unit	Default	Commission
PE-20	User-defined function code 20			N.A.	P0-01	
PE-21	User-defined function code 21			N.A.	P0-02	
PE-22	User-defined function code 22			N.A.	P0-03	
PE-23	User-defined function code 23			N.A.	P0-07	
PE-24	User-defined function code 24			N.A.	P0-08	
PE-25	User-defined function code 25		P0-00 to PP-xx, A1-00 to Ax-xx, U0-xx to U0-xx	N.A.	P0-17	
PE-26	User-defined function code 26			N.A.	P0-18	
PE-27	User-defined function code 27			N.A.	P3-00	
PE-28	User-defined function code 28			N.A.	P3-01	
PE-29	User-defined function code 29			N.A.	P4-00	
PE-30	User-defined function code 30			N.A.	P4-01	
PE-31	User-defined function code 31			N.A.	P4-02	
Group FP: Para. No. Management						
PP-00	User password	0 to 65535		N.A.	0	
PP-01	Parameter initialization	0: No operation 01: Restore factory settings except motor parameters 02: Clear records 04: Restore user backup parameters 501: Back up current user parameters 10: Initialization of power cable payoff parameters 20: Initialization of mechanical movement (vertical, horizontal, arm swing) industry parameters 21: Initialization of inertia industry (fan) parameters 22: Initialization of lathe industry parameters 23: Initialization of quick start/ stop industry (printing machine) parameters		N.A.	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
PP-02	AC drive parameter display property	00 to 11	N.A.	11	
PP-03	Individualized parameter display property	00 to 11	N.A.	00	
PP-04	Parameter modification property	0: Modifiable 1: Not modifiable	N.A.	0	
Group A0: Torque Control					
A0-00	Speed/Torque control selection	0: Speed control 1: Torque control	N.A.	0	
A0-01	Torque setting source in torque control	0 to 7	N.A.	0	
A0-03	Torque digital setting in torque control	-200.0 to 200.0	%	150.0	
A0-05	Forward max frequency in torque control	0.00 to max frequency (P0-10)	Hz	50.00	
A0-06	Reverse max frequency in torque control	0.00 to max frequency (P0-10)	Hz	50.00	
A0-08	Acceleration time in torque control	0.00 to 650.00	s	0.00	
A0-09	Deceleration time in torque control	0.00 to 650.00	s	0.00	
Group A1: Virtual DI/DO					
A1-00	VDI1 function selection	0 to 59	N.A.	0	
A1-01	VDI2 function selection	0 to 59	N.A.	0	
A1-02	VDI3 function selection	0 to 59	N.A.	0	
A1-03	VDI4 function selection	0 to 59	N.A.	0	
A1-04	VDI5 function selection	0 to 59	N.A.	0	
A1-05	VDI state setting mode	00000 to 11111	N.A.	0	
A1-06	VDI state selection	00000 to 11111	N.A.	00000	
A1-07	Function selection for AI1 used as DI	0 to 59	N.A.	00000	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
A1-08	Function selection for AI2 used as DI	0 to 59	N.A.	0	
A1-09	Function selection for AI3 used as DI	0 to 59	N.A.	0	
A1-10	State selection for AI used as DI	000 to 111	N.A.	000	
A1-11	VDO1 function selection	0 to 41	N.A.	0	
A1-12	VDO2 function selection	0 to 41	N.A.	0	
A1-13	VDO3 function selection	0 to 41	N.A.	0	
A1-14	VDO4 function selection	0 to 41	N.A.	0	
A1-15	VDO5 function selection	0 to 41	N.A.	0	
A1-16	VDO1 output delay	0.0 to 3600.0	s	0.0	
A1-17	VDO2 output delay	0.0 to 3600.0	s	0.0	
A1-18	VDO3 output delay	0.0 to 3600.0	s	0.0	
A1-19	VDO4 output delay	0.0 to 3600.0	s	0.0	
A1-20	VDO5 output delay	0.0 to 3600.0	s	0.0	
A1-21	VDO state selection	00000 to 11111	N.A.	00000	
Group A2: Motor 2 Parameters					
A2-00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	N.A.	0	
A2-01	Rated motor power	0.1 to 30.0	kW	Model dependent	
A2-02	Rated motor voltage	1 to 1000	V	Model dependent	
A2-03	Rated motor current	0.01 to 655.35	A	Model dependent	
A2-04	Rated motor frequency	0.01 to max frequency	Hz	Model dependent	
A2-05	Rated motor speed	1 to 65535	RPM	Model dependent	
A2-06	Stator resistance	0.001 to 65.535 0.0001 to 6.5535	Q	Model dependent	
A2-07	Rotor resistance	0.001 to 65.535	Q	Model dependent	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
A2-08	Leakage inductive reactance	0.01 to 655.35	mH	Model dependent	
A2-09	Mutual inductive reactance	0.1 to 6553.5	mH	Model dependent	
A2-10	No-load current	0.01 to A2-03	A	Model dependent	
A2-37	Auto-tuning selection	0: No auto-tuning 1: Static auto-tuning 1 2: Complete auto-tuning 3: Static auto-tuning 2	N.A.	0	
A2-38	Speed loop proportional gain 1	1 to 100	N.A.	30	
A2-39	Speed loop integral time 1	0.01 to 10.00	s	0.50	
A2-40	Switchover frequency 1	0.00 to A2-43	Hz	5.00	
A2-41	Speed loop proportional gain 2	1 to 100	N.A.	20	
A2-42	Speed loop integral time 2	0.01 to 10.00	s	1.00	
A2-43	Switchover frequency 2	A2-40 to max output frequency	Hz	10.00	
A2-44	Vector control slip gain	50 to 200	%	100	
A2-45	Time constant of speed loop filter	0.000 to 1.000	s	0.050	
A2-46	Vector control over-excitation gain	0 to 200	N.A.	0	
A2-47	Torque upper limit source in speed control mode	0 to 7	N.A.	0	
A2-48	Digital setting of torque upper limit in speed control mode	0.0 to 200.0	%	150.0	
A2-49	Selection of torque upper limit reference setting channel in speed control mode (regenerative)	0 to 8	N.A.	0	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
A2-50	Digital setting of torque upper limit in speed control mode (regenerative)	0.0 to 200.0	%	150.0	
A2-51	Excitation adjustment proportional gain	0 to 60000	N.A.	10	
A2-52	Excitation adjustment integral gain	0 to 60000	N.A.	10	
A2-53	Torque adjustment proportional gain	0 to 60000	N.A.	10	
A2-54	Torque adjustment integral gain	0 to 60000	N.A.	10	
A2-55	Speed loop property	00 to 11	N.A.	00	
A2-56	Torque feedforward gain	20 to 100	N.A.	80	
A2-59	Max. torque coefficient in field weakening area	50 to 200	%	80	
A2-60	Regenerative power limit	0.0: Not limited 0.1% to 200.0	%	0.0	
A2-61	Motor 2 control mode	0: Sensorless vector control (SVC) 2: Voltage/Frequency (V/ F) control	N.A.	2	
A2-62	Motor 2 acceleration/ deceleration time	0: Same as motor 1 1: Acceleration/ Deceleration time 1 2: Acceleration/ Deceleration time 2 3: Acceleration/ Deceleration time 3 4: Acceleration/ Deceleration time 4	N.A.	0	
A2-63	Motor 2 torque boost	0.0: Fixed torque boost, 0.1 to 30	%	Model dependent	
A2-65	Motor 2 oscillation suppression gain	0 to 100	N.A.	Model dependent	

Chapter 6

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
Group A5: Control Optimization					
A5-00	DPWM switchover frequency upper limit	0.00 to max output frequency	Hz	Model dependent	
A5-01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	N.A.	0	
A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation	N.A.	1	
A5-03	Random PWM depth	0 to 10	N.A.	0	
A5-04	Fast current limit	0: Disabled 1: Enabled	N.A.	1	
A5-05	Max output voltage coefficient	100 to 110	%	105	
A5-06	Undervoltage threshold	300.0 to 600.0V	V	350.0	
A5-07	SVC optimization mode selection	0: Not optimized 1: Optimization mode 1 2: Optimization mode 2	N.A.	1	
A5-08	Factory reserved	0.0: Invalid 0.1 to 6.0	kHz	0.1	
A5-09	Overvoltage threshold	200.0 to 900.0	V	820.0	
Group A6: AI Curve Setting					
A6-00	AI curve 4 minimum input	-10.00 to A6-02	V	0.00	
A6-01	Corresponding setting of AI curve 4 minimum input	-100.0 to 100.0	%	0.0	
A6-02	AI curve 4 inflexion 1 input	A6-00 to A6-04	V	3.00	
A6-03	Corresponding setting of AI curve 4 inflexion 1 input	-100.0 to 100.0	%	30.0	
A6-04	AI curve 4 inflexion 1 input	A6-02 to A6-06	V	6.00	

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
A6-05	Corresponding setting of AI curve 4 inflexion 1 input	-100.0 to 100.0	%	60.0	
A6-06	AI curve 4 max input	A6-06 to 10.00	V	10.00	
A6-07	Corresponding setting of AI curve 4 max input	-100.0 to 100.0	%	100.0	
A6-08	AI curve 5 minimum input	-10.00 to A6-10	V	0.00	
A6-09	Corresponding setting of AI curve 5 minimum input	-100.0 to 100.0	%	0.0	
A6-10	AI curve 5 inflexion 1 input	A6-08 to A6-12	V	3.00	
A6-11	Corresponding setting of AI curve 5 inflexion 1 input	-100.0 to 100.0	%	30.0	
A6-12	AI curve 5 inflexion 1 input	A6-10 to A6-14	V	6.00	
A6-13	Corresponding setting of AI curve 5 inflexion 1 input	-100.0 to 100.0	%	60.0	
A6-14	AI curve 5 max input	A6-14 to 10.00	V	10.00	
A6-15	Corresponding setting of AI curve 5 max input	-100.0 to 100.0	%	100.0	
A6-24	Jump point of AI1 input corresponding setting	-100.0 to 100.0	%	0.0	
A6-25	Jump amplitude of AI1 input corresponding setting	0.0 to 100.0	%	0.5	
A6-26	Jump point of AI2 input corresponding setting	-100.0 to +100.0	%	0.0	
A6-27	Jump amplitude of AI2 input corresponding setting	0.0 to 100.0	%	0.5	
A6-28	Jump point of AI3 input corresponding setting	-100.0 to +100.0	%	0.0	
A6-29	Jump amplitude of AI3 input corresponding setting	0.0 to 100.0	%	0.5	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
Group AC: AI/AO Correction					
AC-00	AI1 measured voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-01	AI1 displayed voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-02	AI1 measured voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-03	AI1 displayed voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-04	AI2 measured voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-05	AI2 displayed voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-06	AI2 measured voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-07	AI2 displayed voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-08	AI3 measured voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-09	Ai3 displayed voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-10	AI3 measured voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-11	AI3 displayed voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-12	AO1 target voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-13	AO1 measured voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-14	AO1 target voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-15	AO1 measured voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-16	AO2 target voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-17	AO2 measured voltage 1	-10.000 to 10.000	V	Factory corrected	
AC-18	AO2 target voltage 2	-10.000 to 10.000	V	Factory corrected	
AC-19	AO2 measured voltage 2	-10.000 to 10.000	V	Factory corrected	

6.2 Monitoring Parameters

Para. No.	Para. Name	Setting Range	Unit	Default	Commission
Group U0: Monitoring					
U0-00	Running frequency	N.A.	Hz	N.A.	
U0-01	Set frequency	N.A.	Hz	N.A.	
U0-02	Bus voltage	N.A.	V	N.A.	
U0-03	Output voltage	N.A.	V	N.A.	
U0-04	Output current	N.A.	A	N.A.	
U0-05	Output power	N.A.	kW	N.A.	
U0-06	Output torque	N.A.	%	N.A.	
U0-07	DI state	N.A.	N.A.	N.A.	
U0-08	DO state	N.A.	N.A.	N.A.	
U0-09	Ai1 voltage	N.A.	V	N.A.	
U0-10	Ai2 voltage	N.A.	V	N.A.	
U0-11	Ai3 voltage	N.A.	V	N.A.	
U0-12	Count value	N.A.	N.A.	N.A.	
U0-13	Length value	N.A.	N.A.	N.A.	
U0-14	Load speed	N.A.	N.A.	N.A.	
U0-15	PID setting	N.A.	N.A.	N.A.	
U0-16	PID feedback	N.A.	N.A.	N.A.	
U0-17	PLC stage	N.A.	N.A.	N.A.	
U0-18	Input pulse frequency	N.A.	kHz	N.A.	
U0-19	Feedback speed	N.A.	Hz	N.A.	
U0-20	Remaining running time	N.A.	Min	N.A.	
U0-21	Ai1 voltage before correction	N.A.	V	N.A.	
U0-22	Ai2 voltage before correction	N.A.	V	N.A.	
U0-23	Ai3 voltage before correction	N.A.	V	N.A.	
U0-24	Linear speed	N.A.	m/Min	N.A.	

Para. No.	Para. Name	Setting Range	Unit	Default	Commi ssion
U0-25	Accumulative power-on time	N.A.	Min	N.A.	
U0-26	Accumulative running time	N.A.	Min	N.A.	
U0-27	Pulse input frequency	N.A.	Hz	N.A.	
U0-28	Communication setting value	N.A.	%	N.A.	
U0-29	Reserved	N.A.	N.A.	N.A.	
U0-30	Main frequency X	N.A.	Hz	N.A.	
U0-31	Auxiliary frequency Y	N.A.	Hz	N.A.	
U0-32	Viewing any register address value	N.A.	N.A.	N.A.	
U0-34	Motor temperature	N.A.	°C	N.A.	
U0-35	Target torque	N.A.	%	N.A.	
U0-37	Power factor angle	N.A.		N.A.	
U0-39	Target voltage for V/F separation	N.A.	V	N.A.	
U0-40	Output voltage for V/F separation	N.A.	V	N.A.	
U0-41	DI state visual display	N.A.	N.A.	N.A.	
U0-42	DO state visual display	N.A.	N.A.	N.A.	
U0-43	DI function state visual display 1	N.A.	N.A.	N.A.	
U0-44	DI function state visual display 2	N.A.	N.A.	N.A.	
U0-61	AC drive state	N.A.	N.A.	N.A.	
Group U3: Extension Card Communication Control					
U3-00 to U3-15	Reserved	N.A.	N.A.	N.A.	
U3-16	Frequency setting	N.A.	Hz	N.A.	
U3-17	Control command	N.A.	N.A.	N.A.	
U3-18	DO control	N.A.	N.A.	N.A.	
U3-19	Ao1 control	N.A.	N.A.	N.A.	
U3-20	Ao2 control	N.A.	N.A.	N.A.	
U3-21	FMP control	N.A.	N.A.	N.A.	
U3-22	Reserved	N.A.	N.A.	N.A.	
U3-23	Motor speed control	N.A.	RPM	N.A.	
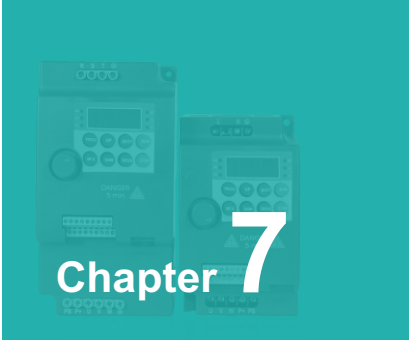
Chapter 7

485 Communication Protocol

This product communication data can be divided into function code data and non-function code data, the latter includes running commands, running status, running parameters, alarm information, etc.

7.1 Function code data

The function code data is the important setting parameters of the frequency converter, as follows:

Function code data	Group P (R/W)	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、PA、PB
	Group A (R/W)	A0、A1、A2、A5、A6、A7、A8、A9、AA、AB、AC

The communication address of function code data is defined as follows：

When reading function code data for communicationer

For function code data in groups P0 to PF and A0 to AF, the 16 digits higher in the communication address are the number of the function group, and the 16 digits lower in the communication address are the number of the function group. For example:

❶ P0-16 function parameter, whose communication address is F010H, where F0H is the function parameter of P0 group, and 10H is the hexadecimal data format of power code 16 in the function group.

❷ Ac-08 function parameter, whose communication address is AC08. ACH indicates the function parameter of the AC group, and 08H indicates the hexadecimal data format of the power code number 8 in the function group.

When writing function code data for communication

For function code data in P0 to PF groups, its communications address is 16 bits higher.The value can be 00 to 0F or P0 to PF. The lower 16 digits are the number of the function code in the function group. For example:

❶ Write function parameters P0-16;

If no EEPROM is written into it, its address is 0010H;

If an EEPROM needs to be written, its address is F010H;

For the function code data in A0 to AF groups, its communications address is 16 digits higher and can be distinguished as if it needs to be written into EEPROM;

40 to 4F or A0 to AF, the lower 16 digits are the number of the function code in the function group. The following is an example:

❷ Write function parameter AC-08:

If no EEPROM is written, the address is 4C08H;

If an EEPROM needs to be written, its address is AC08H.

7.2 Non-function code data

Non-Function code data	**Status data (Only read)**	U group monitoring parameters, frequency converter fault description, frequency converter running state
	Control parameter (Only write)	Control command, communication set value, digital output terminal control, analog output AO1 control, analog output AO2 control, high speed pulse (FMP) output control, parameter initialization

The status data is divided into U group monitoring parameters, frequency converter fault description and frequency converter running state.

U group parameters monitoring parameters

For the description of monitoring data in group U, see Chapter 5 and Chapter 6. The addresses are defined as follows: U0 to UF, the 16 digits higher than U0 are 70 to 7F, and the 16 digits lower are the serial numbers of monitoring parameters in the group. For example, U0-11 is 700BH.

Frequency converter fault description

When the communication reads the fault description of the frequency converter, the communication address is fixed at 8000H. By reading the address data, the upper computer can obtain the current frequency converter fault code. The fault code description is defined in Chapter 5 P9-14 Function code.

Running status of frequency converter

When the communication reads the running state of the converter, the communication address is fixed at 3000H. By reading the address data, the upper computer can obtain the current running state information of the converter, which is defined as follows:

Communication address of frequency converter operation status	Read the status word definition
3000H	1：Forward running 2：Reverse running 3：Shutdown

7.3 Control parameters

Control parameters are divided into control command, digital output terminal control, analog output AO1 control, analog output AO2 control, high speed pulse (FMP) output control.

7.3.1 Control commands

When P0-02(command source) is set to 2: communication control, the upper computer can control the start and stop of the inverter and other related commands through this communication address. The control commands are defined as follows:

Control command communication address	Command function
2000H	1：Forward running 2：Reverse running 3：Forward running inching 4：Reverse running inching 5：Free shutdown 6：Slow down shutdown 7：Fault resetting

7.3.2 Communication set point

Communication set value The frequency source, torque upper limit source, VF separation voltage source, PID given source, PID feedback source, etc. are sel-

ected as the given data of communication timing by the main user This product.Its communication address is 1000H. When the upper computer sets this communication address value, its data range is -10000~10000, corresponding to the relative given value -100.00%~100.00%.

7.3.3 Digital output terminal control

When the function of the digital output terminal is set to 20: communication control, the upper computer can control the digital output terminal of the converter through this communication address, as defined below:

Digital output terminal control communication address	Command content
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

7.3.4 Analog output AO1 and AO2, high-speed pulse output FMP control

When the analog output AO1 and AO2, and the high speed pulse output FMP output function is set to 12: communication setting, the upper computer can control the analog output and high speed pulse output of the inverter through this communication address, as defined below:

Output control communication address		Command content
AO1	2002H	
AO2	2003H	0 ~ 7FFF means 0% ~ 100%
FMP	2004H	

7.3.5 Parameter initialization

This function is required when the upper computer is used to initialize the parameters of the converter.

If P-00 (user password) is not 0, the password verification needs to be carried out through communication first. After the verification is passed, the upper computer initializes the parameters within 30 seconds.

Communication The communication address for user password verification is 1F00H. If the correct user password is directly written into this address, the password verification can be completed

The address for communication parameter initialization is 1F01H, and its data content is defined as follows:

Parameter initialization communication address	Command function
1F01H	1：Restoring factory parameters 2：Recording information clearly 4：Restoring user backup parameter 501：Backup current user parameter

7.4 Protocol Content

Products in this series inverter provides RS485 communication interface and supports Modbus-RTU slave communication protocol. Users can realize centralized control through computer or PLC, through the communication protocol set frequency converter running commands, modify or read function code parameters, read frequency converter working state and fault information, etc.

7.4.1 Parameter initialization

The serial communication protocol defines the content and format of information transmitted in serial communication. These include: host polling (or broadcast) format; The coding method of the host, including: function code requiring action, transmission data and error check, etc. The slave machine's response also adopts the same structure, including: action confirmation, return data and error check. If the slave machine makes an error while receiving the message, or fails to perform the action required by the host, it organizes a fault message and sends

it back to the host in response.

7.4.1.1 Application mode

The frequency converter is connected to the "single master multi-slave" PC/PLC control network with RS485 bus as a communication slave.

7.4.1.2 Bus Structure

❶ Hardware interface

The RS485 expansion card MD38TX1 is inserted into the frequency converter;

❷ Topological structure single host multi-slave system. Each communication device in the network has a unique slave address, and one device acts as the gateway;

Communication host (usually flat PC upper computer, PLC, HMI, etc.), actively initiate communication, read or write the parameters of the slave machine;

Other devices in the communication of the slave machine, in response to the host on the local inquiry or communication operations. Only one device can send at a time;

Data while other devices are in the receiving state;

The slave IP address ranges from 1 to 247. 0 is the broadcast address. Slave addresses in the network must be unique.

❸ communication transmission mode asynchronous serial, half duplex transmission mode. In serial asynchronous communication, data is in the form of messages,Send one frame of data at a time. According to modbus-RTU protocol, when the idle time of no data on the communication data line is greater than 3.5Byte transmission time, indicating the start of a new communication frame.

This series inverter built-in communication protocol is Modbus-RTU slave communication protocol, can respond to the host"Query/command", or according to the host "query/command" to make the corresponding action, and communication data reply.

Mainframe can refer to personal computers (PCS), industrial control equipment or programmable logic controllers (PLCS), etc.

The host can either communicate with a slave individually or broadcast information to all slave. Single for host unique access to "query/command", be accessed from the machine to return a reply frame; For broadcast messages sent by the host, the machine does not need to respond back to the host.

7.5 Communication data structure

This series frequency converter's Modbus protocol communication data format is as follows, frequency converter only supports Word type parameter reading or write. The corresponding communication read operation command is Ox03.The write operation command is 0x06 and does not support byte or bit read/write operations:

Theoretically, the upper computer can read several consecutive function codes at a time (i.e., n can be up to 12), but to do not cross the last function code in this function code group, otherwise an error will be answered.

If the slave machine detects a communication frame error or fails to read or write due to other reasons, it will reply to the error frame.

7.5.1 The data frame description:

The serial communication protocol defines the content and format of information transmitted in serial communication. These include: host polling (or broadcast) format; The coding method of the host, including: function code requiring action, transmission data and error check, etc. The slave machine's response also adopts the same structure, including: action confirmation, return data and error check. If the slave machine makes an error while receiving the message, or fails to perform the action required by the host, it organizes a fault message and sends

START	Idle transfer time of more than 3.5 characters
ADR	Communication address range：1 ~ 247； 0=broadcast address
CMD	03：read parameter； 06：write parameter

Function code number H	The address of the internal parameters of the converter, expressed in hexadecimal; Parameters can be classified into functional and non-functional codes (such as running status parameters and running commands). For details, see Address definition. When transmitting, the high byte is first and the low byte is last.
Function code number L	
Function code number H	Number of function codes read in this frame. If it is 1, one function code is read. When transmitting, the high byte is first and the low byte is last. This protocol can rewrite only one function code at a time.
Function code numberL	
Data H	Reply data, or data to be written, is transmitted with the high byte first and the low byte last.
Data L	
END	3.5 characters

7.5.2 CRC verification mode:

CRC (Cyclic Redundancy Check) uses the RTU frame format and messages include CRC-based methods error detection domain. The CRC domain detects the content of the entire message. The CRC field is two bytes, containing 16 bits of two. A base value calculated by the transport device and added to the message. The RECEIVING device recalculates the CRC for the received message and compared with the received VALUES in the CRC field, if the two CRC values are not equal, it indicates that there is a transmission error.

CRC is stored in 0xFFFF, and then a procedure is called to attach successive 8-bit bytes in the message to the current register. Values are processed. Only 8 bits of data per character are valid for CRC, start and stop bits, and parity

The parity bit is invalid. In CRC, each 8-bit character is individually different or (XOR) from the register contents,

The result is xOR backward to the least significant bit. If LSB is 0, no operation is performed. The whole process is repeated eight times. In the most

After the last bit (8th bit) is complete, the next 8-bit byte is separately different or from the current value of the register. Final check

Is the CRC value after all bytes in the message have been executed.

When CRC is added to a message, the low bytes are added first, then the high bytes.

Address definition for communication parameters：

Read and write function code parameters (some function codes cannot be changed, only for manufacturer use or monitoring use) .

7.5.3 Function Code Parameters Address Labeling rules

Address rule with function code group number and label as parameters:

High order bytes: P0~PF(group P), A0~AF(group A), 70~7F(group U).The value ranges from 00 to PF.For example, if the range function code P3-12 is required, the access address of the function code is expressed as 0 xf30c;

Note:

➢ PF group: parameters can neither be read nor changed;

➢ U group: can only be read, cannot change the parameters.

Some parameters cannot be changed when the converter is in operation state; Some parameters can not be changed no matter what state the converter is in;

Change function code parameters, but also pay attention to the parameter range, unit, and related instructions.

Function code group No.	Communication address	Communication modifies the function code address in RAM
Group P0 ~ PE	0xF000 ~ 0xFEFF	0x0000 ~ 0x0EFF
Group A0 ~ AC	0xA000 ~ 0xACFF	0x4000 ~ 0x4CFF
Group U0	0x7000 ~ 0x70FF	

Note that because the EEPROM is stored frequently, it will reduce the service life of the EEPROM, so some features

Code in communication mode, do not need to store, just change the value in RAM can be.

➢ If it is group P parameter, the function can be realized by changing the high position F of the function code address to 0.

➢ If it is group A parameter, to achieve this function, just change the high position A of the function code address to 4

It can be done. The address of the corresponding function code is as follows:

High byte: 00~0F(group P), 40~4F(group A)，The value ranges from 00 to FF

Such as:

Function code P3-12 is not stored in the EEPROM, and the address is 030C.

Function code A0-05 is not stored in the EEPROM, and the address is 4005.

This address indicates that the RAM can only be written, but cannot be read. When read, the address is invalid.

You can also use the command code 07H for all parameters.

The data is given by the upper computer through the communication address 0x1000. The data format is data with 2 decimal points, and the data range Is P0-10 ~ + P0-10.

❶ Shutdown/operation parameters:

Parameter address	Parameter description	Parameter address	Parameter description
1000H	* Communication set value (decimal)	1010H	PID set
1001H	−10000 ~ 10000	1011H	PID feedback
1002H	Running frequency	1012H	PLC procedure
1003H	Busbar voltage	1013H	PULSE Input pulse frequency，unit: 0.01kHz
1004H	Output voltage	1014H	Feedback speed，unit: 0.1Hz
1005H	Output current	1015H	Remaining running time
1006H	Output power	1016H	AI1 Pre-calibration voltage
1007H	Output torque	1017H	AI2 Pre-calibration voltage
1008H	Running speed	1018H	AI3 Pre-calibration voltage
1009H	DI input symbol	1019H	Linear velocity
100AH	AI1 voltage	101AH	Current power-on time
100BH	AI2 voltage	101BH	Current running time

Parameter address	Parameter description	Parameter address	Parameter description
100CH	AI3 voltage	101CH	PULSE input pulse frequency , unit: 1Hz
100DH	Calculation value input	101DH	Communication setting value
100EH	Length value input	101EH	Actual feedback speed
100FH	Load speed	101FH	Main frequency X display
--	–	1020H	Auxiliary frequency Y display

Note:

➢ Communication set value is the percentage of relative value, 10000 corresponds to 100.00%, -10000 corresponds to -100.00%.

➢ For frequency dimensional data, the percentage is a percentage relative to the maximum frequency (P0-10); For the dimension of torque.

➢ The percentage is P2-10 and A2-48 (the upper limit of torque is set numerically, corresponding to the first and second motors respectively).

❷ Control the command input into the frequency converter :(write only)

Command character address	Command function
2000H	0001：Forward running 0002：Reverse running 0003：Forward running inching 0004：reserve running inching 0005：Free shutdown 0006：Slow down shutdown 0007：Fault resetting

❸ Read frequency converter state :(read only)

Status character address	Status character function
3000H	0001：Forward running 0002：Reserve running 0003：Shutdown

❹ Parameter lock password verification :(if 8888H is returned, the password verification is passed)Parameter lock password verification :(if 8888H is returned, the password verification is passed)

Password address	Input password content
1F00H	*****

❺ Digital output terminal control :(write only)

Command address	Command content
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

❻ Analog output AO1 control :(write only)

Command address	Command content
2002H	0 ~ 7FFF means 0% ~ 100%

❼ Analog output AO2 control :(write only)

Command address	Command content
2003H	0 ~ 7FFF means 0% ~ 100%

❽ Pulse output control :(write only)

Command address	Command content
2004H	0 ~ 7FFF means 0% ~ 100%

❾ Frequency converter fault Description:

Frequency converter address	Frequency converter fault information	Frequency converter fault information
8000H	0000：No fault 0001：Retain 0002：Accelerated overcurrent 0003：Retarding overcurrent 0004：Constant speed overcurrent 0005：Accelerated overvoltage 0006：Retarding overvoltage 0007：Constant speed overvoltage 0008：The buffer resistor is overloaded 0009：Under-voltage fault 000A：Inverter overload 000B：Motor overload 000C：Input phase lack 000D：Output phase lack 000E：Module overheating 000F：External fault 0010：Abnormal communication 0011：Abnormal contactor 0012：Current detection fault 0013：Motor tuning fault 0014：Encoder /PG card fault	0015：Parameter read/write exception 0016：Inverter hardware fault 0017：Short circuit fault of motor to ground 0018：Retain 0019：Retain 001A：Running time arrival 001B：User-defined fault 1 001C：User-defined fault 2 001D：Power-on time arrival 001E：Off-load 001F：PID feedback lost while running 0028：Fast traffic limiting times out 0029：Fault of switching motor while running 002A：Excessive velocity deviation 002B：Motor overspeed 002D：Motor overtemperature 005A：Wrong encoder cable number setting 005B：Disconnected encoder 005C：Wrong initial position 005E：Wrong feedback speed

	Baud rate	Factory default	6005
Fd-00		Unit: MODBUS baud rate	
	Setting range	0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS	5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS 9：115200BPS

7.5.4 Group FD communication parameter description

This parameter is used to set the data transmission rate between the host computer and the frequency converter. Note that the baud rate set by the upper computer and the frequency converter must be consistent, otherwise, communication cannot proceed. The higher the baud rate, the faster the communication speed.

	Data format	Factory default	0
Fd-01	Setting range	0：No check：data format <8,N,2> 1：Even check：data format <8,E,1> 2：Uneven check：data format <8,O,1> 3：No check：data format <8-N-1>	

The data format set by the upper computer and the frequency converter must be consistent; otherwise, communication cannot be carried out.

	Local address	Factory default	1
Fd-02	Setting range	1~247,0 broadcast address	

When the local address is set to 0, it is the broadcast address to realize the broadcast function of the upper computer. The native address has uniqueness (except broadcast address) is the basis of point-to-point communication between the host computer and the frequency converter.

	Response delay	Factory default	2ms
Fd-03	Setting range	0~20ms	

Response delay: refers to the interval between the end of data acceptance of the inverter and the sending of data to the upward machine. If the response delay is less than system processing time, the answer delay is based on the system processing time. If the answer delay is longer than the system processing time, the system processes it.

After the data, to delay the wait, until the response delay time to send data to the machine.

Fd-04	Communication timeout	Factory default	0.0 s
	Setting range	0.0 s (null) ; 0.1~60.0s	

When the function code is set to 0.0s, the communication timeout parameter is invalid.

When the function code is set to a valid value, if the interval between one communication and the next communication exceeds the communication timeout period, the system

Communication failure error (Err16) will be reported. Typically, this is set to invalid. If in a continuous communication system, set parameters to monitor communication.

Fd-05	Communication protocol selection	Factory default	0
	Setting range	0 : Non-standard Modbus protocol ; 1 : Standard Modbus protocol	

Pd-05=1: Select the standard Modbus protocol.

Pd-05=0: When the command is read, the number of bytes returned from the slave machine is one byte more than that of the standard Modbus protocol. For details, see section 5 Communication Data Structure of this Agreement.

Fd-06	Communication read current resolution	Factory default	0
	Setting range	0 : 0.01A ; 1 : 0.1A	

The output unit used to determine the value of the current when the communication reads the output current.

7.6 Reference for actual use

Use 485 communication to control frequency, start and stop.

❶ Set P002 to 2 and select the communication command channel

Send control code: 01 06 F0 02 00 02 9A CB

❷ Set P003 to 9, and set the main frequency source for communication

Send control code: 01 06 F0 03 00 09 8A CC

❸ Start

Send control code: 01 06 20 00 00 01 43 CA

❹ Set the operating frequency to 32HZ, with two decimal points, the setting value must be placed in the high

Send control code: 01 06 10 00 20 00 94 CA

❺ Stop

Send control code: 01 06 20 00 00 06 02 08

WARRANTY

❶ The company solemnly promises that users will enjoy the following warranty services from the date of purchase of products from our company (hereinafter referred to as the manufacturer).

❷ Since the product was purchased by the user from the manufacturer, enjoy the following three guarantee services:

  ¤ Return, replacement and repair within 30 days of delivery:

  ¤ Replacement and repair within 90 days of delivery:

  ¤ Repair within 18 months of delivery:

  ¤ Except when exporting abroad.

❸ This product enjoys lifetime paid service from the date of purchase by the user from the manufacturer.

❹ Disclaimer: Product failure caused by the following reasons is not covered by the manufacturer's free warranty service:

  ¤ Failure caused by the user's use and operation in accordance with the requirements of the «Instruction Manual»:

  ¤ Failure caused by the user to repair or modify the product without communicating with the manufacturer:

  ¤ Failure caused by abnormal aging of the product due to poor user environment:

  ¤ Failures caused by natural disasters such as earthquakes, fires, floods or abnormal voltages:

  ¤ Damage to the product during transportation (the transportation method is specified by the customer, and the company assists in handling the cargo consignment procedures)

❺ Under the following conditions, manufacturers have the right not to provide warranty services:

  ¤ When the manufacturer's product logo, trademark, nameplate, etc. are damaged or unrecognizable:

  ¤ When the user fails to pay the purchase price in accordance with the signed contract:

  ¤ The user intentionally conceals the manufacturer's after-sales service unit when the product is installed, wired, operated, maintained or otherwise improperly used

❻ For the service of return, replacement and repair, the company must return or return to the company, and it can only be returned or repaired after confirming the responsibility vested.

WARRANTY CARD

User information		
User name		
User address		
Postal code	Contact person	
Tel	Fax	
Machine type	Machine code	
Agent / Reseller Information		
Supplier		
Contact		
Tel	Delivery date	

CERTIFICATE OF QUALITY

QC test：_____

This product has been tested by our company's quality department, and its performance meets the standards, passes the inspection, and is approved to leave the factory.

Version
1.0