ISTECH

IST200 Series

**High–Performance
Low Voltage Variable Frequency Drive**

User Manual

SHANGHAI ISTECH ELECTRIC CO.,LTD.

Preface

Thank you for purchasing the IST200 series VFD.

The IST200 series AC drive is a general−purpose high−performance vector control AC drive.

This manual describes the correct used of the IST200 Series AC drive, including installation, parameter setting, maintenance & inspection. Read and understand the manual before use and forward the manual to the end user.

NOTES
● The drawings in the manual are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.   ● The drawings in the manual are show for description only and may not match the product you purchased.   ● The instructions are subject to change, without notice, due to product upgrade, specification modification as well as efforts to increase the accuracy and convenience of the manual.   ● Contact our agents or customer service center if you have problems during the use.   The global service e−mail: sales@istech−electric.com

Upon unpacking check:

Whether the name plate model and AC drive ratings are consistent with your order. The box contains the AC drive, certificate of conformity, user manual and warranty card.

Whether the AC drive is damaged during transportation. If you find any omission or damage, contact ISTECH or your supplier immediately.

First−time Use:

For the users who use this product for the first time, read the manual carefully. If in doubt concerning some functions or performances, contact the technical support personnel of ISTECH to ensure correct use.

$C\epsilon$

The CE mark on the IST200 declares that the AC drive complies with the European low voltage directive (LVD) and EMC directive.

IEC/EN61800−5−1:2003
IEC/EN 61800−3:2004

In this manual, the notices are graded based on the degree of danger:

⚠ **DANGER** indicates that failure to comply with the notice will result in severe personal injury or even death.

⚠ **WARNING** indicates that failure to comply with the notice will result in personal injury or property damage.

Read this manual carefully so that you have a thorough understanding. Installation, commissioning or maintenance may be performed in conjunction with this chapter. ISTECH will assume no liability or responsibility for any injury or loss caused by improper operation.

Use Stage	Safety Grade	Precautions
Before installation	⚠ **DANGER**	● Do not install the equipment if you find water seepage, component missing or damage upon unpacking. ● Do not install the equipment if the packing list does not conform to the product you received.
	⚠ **WARNING**	● Handle the equipment with care during transportation to prevent damage to the equipment. ● Do not use the equipment with damaged or missing components. Failure to comply will result in personal injury. ● Do not touch the components with your hands. Failure to comply will result in static electricity damage.
During installation	⚠ **DANGER**	● Install the equipment on incombustible objects such as metal, and keep it away from combustible materials. Failure to comply may result in a fire. ● Do not loosen the fixed screws of the components, especially the screws with red mark.
	⚠ **WARNING**	● Do not drop wire end or screw into the AC drive. Failure to comply will result in damage to the AC drive. ● Install the AC drive in places free of vibration and direct sunlight. ● Arrange the installation positions properly when two AC drives are laid in the same cabinet to ensure the cooling effect.
At wiring	⚠ **DANGER**	● Wiring must be performed only by qualified personnel under instructions described in this manual. Failure to comply may result in unexpected accidents. ● A circuit breaker must be used to isolate the power supply and the AC drive. Failure to comply may result in a fire. ● Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock. ● Tie the AC drive to ground properly by standard. Failure to comply may result in electric shock.
	⚠ **WARNING**	● Never connect the power cables to the output terminals (U, V, W) of the AC drive. Pay attention to the marks of the wiring terminals and ensure correct wiring. Failure to comply will result in damage to the AC drive. ● Never connect the braking resistor between the DC bus terminals (+) and (−). Failure to comply may result in a fire. ● Use wire sizes recommended in the manual. Failure to comply may result in accidents. ● Use a shielded cable for the encoder, and ensure that the shielding layer is reliably grounded.

Use Stage	Safety Grade	Precautions
Before power–on	⚠ DANGER	● Check that the following requirements are met: – The voltage class of the power supply is consistent with the rated voltage class of the AC drive. – The input terminals (R, S, T) and output terminals (U, V, W) are properly connected. – No short–circuit exists in the peripheral circuit. – The wiring is secured. ● Failure to comply will result in damage to the AC drive Do not perform the voltage resistance test on any part of the AC drive because such test has been done in the factory. Failure to comply will result in accidents.
	⚠ WARNING	● Cover the AC drive properly before power–on to prevent electric shock. ● All peripheral devices must be connected properly under the instructions described in this manual. Failure to comply will result in accidents
After power–on	⚠ DANGER	● Do not open the AC drive's cover after power–on. Failure to comply may ● result in electric shock. Do not touch any I/O terminal of the AC drive. Failure to comply may result in electric shock.
	⚠ WARNING	● Do not touch the rotating part of the motor during the motor auto–tuning or running. Failure to comply will result in accidents. ● Do not change the default settings of the AC drive. Failure to comply will result in damage to the AC drive.
During operation	⚠ DANGER	● Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal burnt. ● Signal detection must be performed only by qualified personnel during operation. Failure to comply will result in personal injury or damage to the AC drive.
	⚠ WARNING	● Avoid objects falling into the AC drive when it is running. Failure to comply will result in damage to the AC drive. ● Do not start/stop the AC drive by turning the contactor ON/OFF. Failure to comply will result in damage to the AC drive.
During maintenance	⚠ DANGER	● Repair or maintenance of the AC drive may be performed only by qualified personnel. Failure to comply will result in personal injury or damage to the AC drive. ● Do not repair or maintain the AC drive at power–on. Failure to comply will result in electric shock. ● Repair or maintain the AC drive only ten minutes after the AC drive is powered off. This allows for the residual voltage in the capacitor to discharge to a safe value. Failure to comply will result in personal injury. ● Ensure that the AC drive is disconnected from all power supplies before starting repair or maintenance on the AC drive. ● Set and check the parameters again after the AC drive is replaced. ● All the pluggable components must be plugged or removed only after power–off. ● The rotating motor generally feeds back power to the AC drive. As a result, the AC drive is still charged even if the motor stops, and the power supply is cut off. Thus ensure that the AC drive is disconnected from the motor before starting repair or maintenance on the AC drive.

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Chapter 1 Product Information

1.1 IST200 Series

Table1−1 IST200 Series Model and technical data

Model	Power Capacity kVA	Input Current A	Output Current A	Adaptable Motor	
				kW	HP
Single−phase: 220V, 50/60Hz					
IST200S0.7G	1.5	8.2	4.0	0.75	1
IST200S1.5G	3.0	14.0	7.0	1.5	2
IST200S2.2G	4.0	23.0	9.6	2.2	3
Three−phase: 380V, 50/60Hz					
IST200T0.7G	1.5	3.4	2.1	0.75	1
IST200T1.5G	3.0	5.0	3.8	1.5	2
IST200T2.2G	4.0	5.8	5.1	2.2	3
IST200T3.7G/5.5P	5.9	10.5	9.0	3.7	5.5
IST200T5.5G/7.5P	8.9	14.6	13.0	5.5	7.5
IST200T7.5G/11P	11.0	20.5	17.0	7.5	11
IST200T11G/15P	17.0	26.0	25.0	11.0	15
IST200T15G/18.5P	21.0	35.0	32.0	15.0	18.5
IST200T18.5G/22P	24.0	38.5	37.0	18.5	22
IST200T22G/30P	30.0	46.5	45.0	22	30
IST200T30G/37P	40.0	62.0	60.0	30	37
IST200T37G/45P	57.0	76.0	75.0	37	45
IST200T45G/55P	69.0	92.0	91.0	45	55
IST200T55G/75P	85.0	113.0	112.0	55	75
IST200T75G/90P	114.0	157.0	150.0	75	90
IST200T90G/110P	134.0	180.0	176.0	90	110
IST200T110G/132P	160.0	214.0	210.0	110	132
IST200T132G/160P	192.0	256.0	253.0	132	160
IST200T160G/200P	231.0	307.0	304.0	160	200
IST200T200G/220P	250.0	385.0	377.0	200	220
IST200T220G/250P	280.0	430.0	426.0	220	250
IST200T250G/280P	355.0	468.0	465.0	250	280
IST200T280G/315P	396.0	525.0	520.0	280	315
IST200T315G/355P	445.0	590.0	585.0	315	355
IST200T355G/400P	500.0	665.0	650.0	355	400
IST200T400G/450P	565.0	785.0	725.0	400	450

1.2 Technical Specifications

Table1–2 IST200 Technical Specifications

Items		Specifications	
Standard functions	Maximum frequency	Vector control: 0–300 Hz; V/F control: 0–3200 Hz	
	Carrier frequency	0.5–16 kHz; The carrier frequency is automatically adjusted based on the load features.	
	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.025%	
	Control mode	Sensorless vector control (SVC); Flux vector control (FVC); Voltage/Frequency (V/F) control	
	Startup torque	G type: 0.5Hz/150% (SVC); 0Hz/180% (FVC); P type: 0.5Hz/100%	
	Speed range	1:100 (SVC)	1:1000 (FVC)
	Speed stability accuracy	± 0.5% (SVC)	± 0.02% (FVC)
	Torque control accuracy	± 5% (FVC)	
	Overload capacity	G type: 60s for 150% of the rated current, 3s for 180% of the rated current P type: 60s for 120% of the rated current, 3s for 150% of the rated current	
	Torque boost	Fixed boost; Customized boost 0.1%–30.0%	
	V/F Curve	Straight–line V/F curve; Multi–point V/F curve; N–power V/F curve (1.2–power, 1.4–power, 1.6–power, 1.8–power, square)	
	V/F Separation	Two types: complete separation; half separation	
	Ramp mode	Straight–line ramp; S–curve ramp. Four kinds of acceleration/deceleration time with the range of 0.0–6500.0s	
	DC braking	DC braking frequency: 0.00 Hz–max. frequency; Braking time: 0.0–36.0s; Braking action current value: 0.0%–100.0%	
	JOG control	JOG frequency range: 0.00–50.00 Hz JOG acceleration/deceleration time: 0.0–6500.0s	
	Onboard multiple preset speeds	It implements up to 16 speeds via the simple PLC function or combination of DI terminal states.	
	Onboard PID	It realizes process–controlled closed loop control system easily.	
	Auto voltage regulation (AVR)	It can keep constant output voltage automatically when the mains voltage changes.	
	Over voltage / Over current stall control	The current and voltage are limited automatically during the running process so as to avoid frequent tripping due to overvoltage/overcurrent.	
	Rapid current limit	It helps to avoid frequent overcurrent faults of the AC drive.	
	Torque limit and control	It can limit the torque automatically and prevent frequent over current tripping during the running process. Torque control can be implemented in the FVC mode.	
Individualized functions	Instantaneous power stop	When the power supply instantaneous stop, the Load can feedback energy to compensates the Voltage reduction, ensure the LV VFD can continuous operation for a short time.	
	Virtual I/Os	Five groups of virtual DI/Dos can realize simple logic control.	

Table1–2 IST200 Technical Specifications

Items		Specifications
Individualized functions	Timing control	Setting time range: 0.0–6500.0 minutes
	Multi–motor switchover	Four motors can be switched over via four groups of motor parameters.
	Multiple communication protocols	It supports 3 types communication via RS–485, Profibus–DP, CAN
	Motor overheat protection	The optional I/O extension card enables AI3 to receive the motor temperature sensor input
	Multiple encoder types.	It supports various encoders such as differential encoder, open–collector encoder, resolver and UVW encoder.
RUN	Running command source	Operation panel; Control terminals; Serial communication port. You can perform switchover between these sources in various ways.
	Frequency source	There are a total of 10 frequency sources, such as digital setting, analog voltage setting, analog current setting, pulse setting and serial communication port setting. You can perform switchover between these sources in various ways.
	Auxiliary frequency source	There are ten auxiliary frequency sources. It can implement fine tuning of auxiliary frequency and frequency synthesis.
	Input terminal	Standard: 5 digital input (DI) terminals, one of which supports up to 100 kHz high–speed pulse input5 2 analog input (AI) terminals, one of which only supports 0–10 V voltage input and the other supports 0–10 V voltage input or 4–20 mA current input Expanding capacity: 5 DI terminals 1 AI terminal that supports –10–10 V voltage input and also supports PT100\PT1000
	Output terminal	Standard: 1 high–speed pulse output terminal (open–collector) that supports 0–100 kHz square wave signal output 1 digital output (DO) terminal 1 relay output terminal 1 analog output (AO) terminal that supports 0–20mA current output or 0–10 V voltage output Expanding capacity: 1 DO terminal 1 relay output terminal 1 AO terminal that supports 0–20 mA current output or 0–10 V voltage output
Display & Operation panel	LED display	It displays the parameters.
	Key locking and function selection	It can lock the keys partially or completely and define the function range of some keys so as to prevent mis–function.
	Protection mode	Motor short–circuit detection at power–on, input/output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection and overload protection
	Optional parts	LCD operation panel, braking unit, I/O extension card 1, I/O extension card 2, user programmable card, RS485 communication card, PROFIBUS–DP communication card, CANlink communication card, CANopen communication card, differential input PG card, UVW differential input PG card, resolver PG card and OC input PG card

Table1−2 IST200 Technical Specifications

Items		Specifications
Environment	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt.
	Altitude	Lower than 1000 m
	Ambient temperature	−10℃ to +40℃
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9 m/s (0.6 g)
	Storage temperature	−20℃ to +60℃

1.3 Appearance and Installation Dimensions

1.3.1 Appearance
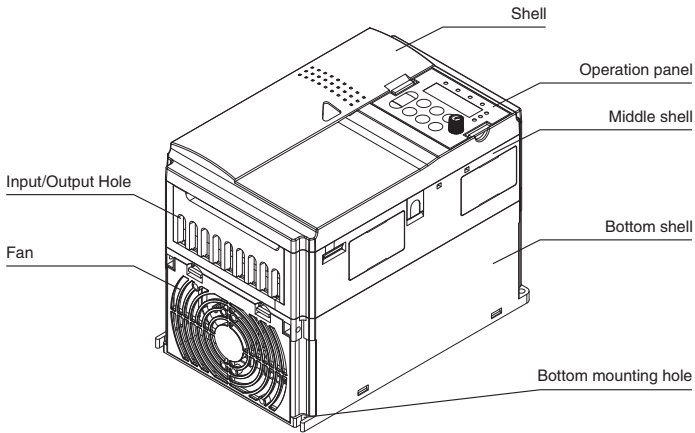
Figure 1−1 IST200 series overall appearance
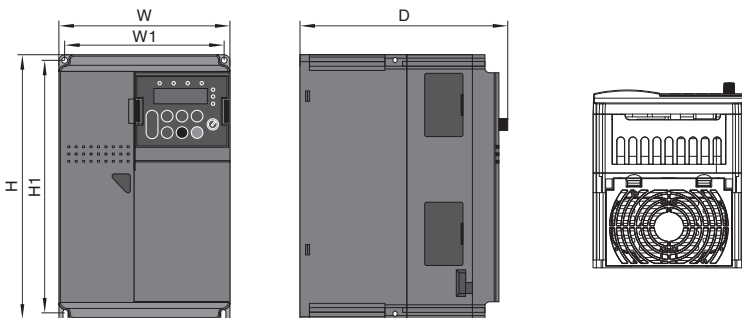
Figure 1−2 IST200 Series Plastic housing Overall Dimensions and installation Dimensions

1.3 Appearance and Installation Dimensions
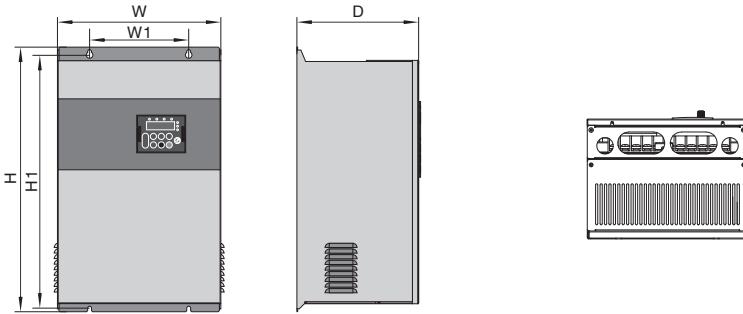
Figure 1−3 IST200 Series Sheet Metal housing Overall Dimensions and Installation Dimensions

1.3.2 IST200 Appearance and Installation Dimension as below(mm)

IST200 Series Appearance as below:

Model	Housing Type
Single−Phase 220V	
0.4kW~2.2kW	Plastic housing
Three−phase 380V	
0.75kW~15kW	Plastic housing
18.5kW~400kW	Sheet Metal housing

Table 1−3 IST200 Series Appearance and Installation Dimension

Model	Mounting Hole mm		Overall Dimension mm			Mounting Hole Diameter mm	Weight kg
	H1	W1	H	W	D		
Single−phase: 220V, 50/60Hz							
IST200S0.7G	113	172	186	125	164	Φ5.0	1.1
IST200S1.5G	113	172	186	125	164	Φ5.0	1.1
IST200S2.2G	113	172	186	125	164	Φ5.0	1.1
Three−phase: 380V, 50/60Hz							
IST200T0.7G	113	172	186	125	164	Φ5.0	1.1
IST200T1.5G	113	172	186	125	164	Φ5.0	1.1
IST200T2.2G	113	172	186	125	164	Φ5.0	1.1
IST200T3.7G/5.5P	148	236	248	160	183	Φ5.0	2.5
IST200T5.5G/7.5P	148	236	248	160	183	Φ5.0	2.5
IST200T7.5G/11P	190	305	322	208	192	Φ6	6.5
IST200T11G/15P	190	305	322	208	192	Φ6	6.5
IST200T15G/18.5P	190	305	322	208	192	Φ6	6.5
IST200T18.5G/22P	456	176	470	290	217	Φ6.5	18

Table 1−3 IST200 Series Appearance and Installation Dimension

Model	Mounting Hole mm		Overall Dimension mm			Mounting Hole Diameter mm	Weight kg
	H1	W1	H	W	D		
Three−phase: 380V, 50/60Hz							
IST200T22G/30P	456	176	470	290	217	Φ6.5	18
IST200T30G/37P	456	176	470	290	217	Φ6.5	18
IST200T37G/45P	567	230	582	375	263	Φ9	30
IST200T45G/55P	567	230	582	375	263	Φ9	30
IST200T55G/75P	567	230	582	375	263	Φ9	30
IST200T75G/90P	738	320	756	461	332	Φ9	100
IST200T90G/110P	738	320	756	461	332	Φ9	100
IST200T110G/132P	738	320	756	461	332	Φ9	100
IST200T132G/160P	935	380	955	550	332	Φ11	120
IST200T160G/200P	935	380	955	550	332	Φ11	120
IST200T200G/220P	935	380	955	550	332	Φ11	120
IST200T220G/250P	1030	420	1060	650	377	Φ12	130
IST200T250G/280P	1030	420	1060	650	377	Φ12	130
IST200T280G/315P	1030	420	1060	650	377	Φ12	130
IST200T315G/355P	1300	520	1358	800	400	Φ14	200
IST200T355G/400P	1300	520	1358	800	400	Φ14	200
IST200T400G/450P	1300	520	1358	800	400	Φ14	200

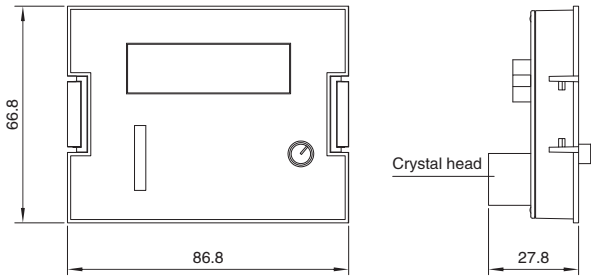1.3.3 Dimensions of External Operation Panel

Figure 1−4 Dimensions of External Operation Panel

Figure 1−5 Mounting Hole Dimensions of External Operation Panel

Chapter 2 Mechanical and Electrical Installation

Table 2−1 Selection of peripheral electrical devices of the IST200

AC Drive Model	MCCB A	Contactor A	Cable of Input Side Main Circuit mm^2	Cable of Output Side Main Circuit mm^2	Cable of Control Circuit mm^2
Single−phase 220V					
IST200S0.7G	16	10	2.5	2.5	2.5
IST200S1.5G	20	16	4.0	2.5	2.5
IST200S2.2G	32	20	6.0	4.0	4.0
Three−phase 380V					
IST200T0.7G	10	10	2.5	2.5	2.5
IST200T1.5G	16	10	2.5	2.5	2.5
IST200T2.2G	16	10	2.5	2.5	2.5
IST200T3.7G/5.5P	25	16	4.0	4.0	4.0
IST200T5.5G/7.5P	32	25	4.0	4.0	4.0
IST200T7.5G/11P	40	32	4.0	4.0	4.0
IST200T11G/15P	63	40	4.0	4.0	4.0
IST200T15G/18.5P	63	40	6.0	6.0	6.0
IST200T18.5G/22P	100	63	6	6	6
IST200T22G/30P	100	63	10	10	10
IST200T30G/37P	125	100	16	10	10
IST200T37G/45P	160	100	16	16	16
IST200T45G/55P	200	125	25	25	25
IST200T55G/75P	200	125	35	25	25
IST200T75G/90P	250	160	50	35	35
IST200T90G/110P	250	160	70	35	35
IST200T110G/132P	350	350	120	120	120
IST200T132G/160P	400	400	150	150	150
IST200T160G/200P	500	400	185	185	185
IST200T200G/220P	600	600	150×2	150×2	150×2
IST200T220G/250P	600	600	150×2	150×2	150×2
IST200T250G/280P	800	600	185×2	185×2	185×2
IST200T280G/315P	800	800	185×2	185×2	185×2
IST200T315G/355P	800	800	150×3	150×3	150×3
IST200T355G/400P	800	800	150×4	150×4	150×4
IST200T400G/450P	1000	1000	150×4	150×4	150×4

2.1.1 Main circuit terminal and connection

⚠ **Danger**

● Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock.

● Wiring must be performed only by qualified personnel under instructions described in this manual. Failure to comply may result in unexpected accidents.

● A circuit breaker must be used to isolate the power supply and the AC drive. Failure to comply may result in a fire.

⚠ **Notes**

● The voltage class of the power supply is consistent with the rated voltage class of the AC drive. Failure to comply will result in damage to the AC drive

● Check the motor match the AC driver, Failure to damage the Motor or AC driver protected.

● The input terminals (R, S, T) and output terminals (U, V, W)are properly connected. Failure to comply will result in damage to the AC drive

● Never connect the braking resistor between the DC bus terminals (+) and (–). Failure to comply may result in a fire.

Table 2–2 Description of main circuit terminals of three–phase AC drive

Terminal	Name	Description
R, S, T	Single–phase power supply input terminals	Connect the three–phase AC power supply
(+), (–)	Positive and negative terminal of DC bus	Common DC bus input point Connect extermal braking unit to the AC drive of 18.5kW and above (220V) and 37kW and above (other voltage classes)
(+), PB	Connecting terminals of braking resistor	Connect the braking resistor for the AC drive of 15kW and below (220V) and 30kW and below (other voltage classes)
P, (+)	Connecting terminals of extemal reactor	Connect an extemal reactor
U, V, W	AC drive output terminals	Connect a three–phase motor
⏚	Grounding terminal	Must be grounded

Precautions on the Wiring

a) Power input terminals R, S, T:

● The cable connection on the input side of the AC drive has no phase sequence requirement.

b) DC bus terminals (+), (−):

● Terminals (+) and (−) of DC bus have residual voltage after the AC drive is switched off. After indicator CHARGE goes off, wait at least 10 minutes before touching the equipment Otherwise, you may get electric shock.

● When selecting external braking unit for the AC drive of above 37kW, do not reverse poles (+) and (−). Otherwise, it may damage the AC drive and even cause a fire.

● The cable length of the braking unit shall be no longer than 10 m. Use twisted pair wire or pair wires for parallel connection.

● Do not connect the braking resistor directly to the DC bus. Otherwise, it may damage the AC drive and even cause fire.

c) Braking resistor connecting terminals (+), PB

● The connecting terminals of the braking resistor are effective only for the AC drive of up to and including 30 kW, fitted with the internal braking unit.

● The cable length of the braking resistor shall be less than 5 m. Otherwise, it may damage the AC drive.

d) External reactor connecting terminals P, (+)

● When connecting external reactor for AC drive of above 7.5kW, remove the jumper bar across terminals P and (+) and install the reactor between the two terminals.

e) AC drive output terminals U, V, W:

● The capacitor or surge absorber cannot be connected to the output side of the AC drive. Otherwise, it may cause AC drive fault or even damage the AC drive.

● If the motor cable is too long, electrical resonance will be generated due to the impact of distributed capacitance, thus damaging the motor insulation or generating higher leakage current, causing the AC drive to trip in overcurrent protection. If the motor cable is longer than 100 m, an AC output reactor must be installed close to the AC drive.

f) Terminal PE

● This terminal must be reliably connected to the main earthing conductor, earthing resistance must less than 0.1 Ω. Otherwise, it may cause electric shock, mal−function or even damage to the AC drive.

● Do not connect the earthing terminal to the neutral conductor of the power supply.

2.1.2 Control circuit terminal and connection

1) Layout of Control Circuit Terminals as below:

+10V	AI1	AI2	DI1	DI2	DI3	DI4	DI5	COM
	GND	GND	A01	CME	COM	D01	FM	+24V	OP

T/A	T/B	T/C
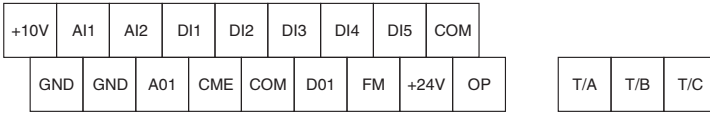
Picture 2–1 Layout of Control Circuit Terminals

2) Wiring Diagram of AC Drive Control Circuit

Figure 2–2 IST200 Wiring Diagram

3) Description of Control Circuit Terminals

Table2–3 Description of the use of control circuit terminals

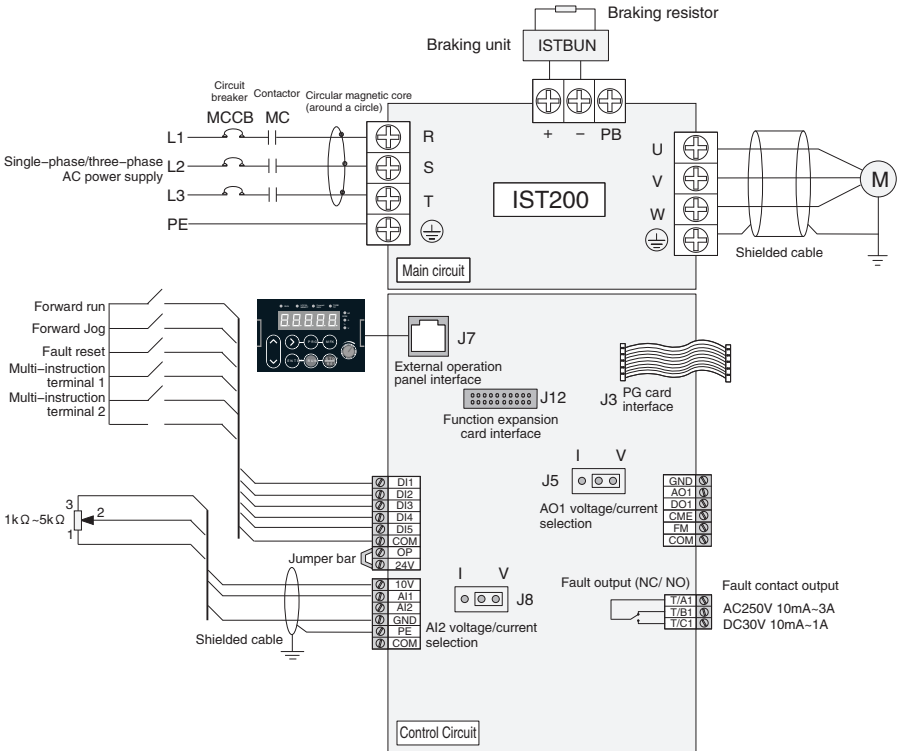| Type	Terminal	Name	Function Description
Power supply	+10V–GND	External +10V power supply	Provide +10V power supply to external unit. Generally, it provides power supply to external potentiometer with resistance range of 1–5kΩ. Maximum output current: 10mA
	+24V–COM	External +24V power supply Applying to Overvoltage Category II circuit	Provide +24V power supply to external unit. Generally, it provides power supply to DI/DO terminals and external sensors. Maximum output current: 200mA
	OP	Input terminal of external power supply	Connect to +24V by default. When DI1–DI5 need to be driven by external signal, OP needs to be connected to external power supply and be disconnected from +24V
Analog input	AI1–GND	Analog input 1	Input voltage range: DC 0–10V Resistance input: 22kΩ
	AI2–GND	Analog input 2	Input range: DC 0–10V/4–20mA, decided by jumper J8 on the control board Resistance input: 22kΩ (voltage input), 500Ω (current input)
Digital input	DI1– OP	Digital input 1	Optical coupling isolation, compatible with dual polarity input Resistance input: 2.4kΩ Voltage range for level input: 9–30V
	DI2– OP	Digital input 2	
	DI3– OP	Digital input 3	
	DI4– OP	Digital input 4	
	DI5– OP	High–speed pulse input	Besides features of DI1–DI4, it can be used for high–speed pulse input. Maximum input frequency: 100kHz
Analog output	AO1–GND	Analog output 1	Voltage or current output is decided by jumper J5. Output voltage range: 0–10V Output current range: 0–20mA
Digital output	DO1–CME	Digital output 1	Optical coupling isolation, dual polarity open collector output Output voltage range: 0–24V Output current range: 0–50mA Note that CME and COM are internally insulated, but they are shorted by jumper externally. In this case DO1 is driven by +24V by default. If you want to drive DO1 by external power supply, remove the jumper.
	FM–CME	High–speed pulse output	It is limited by F5–00 (FM terminal output mode selection). As high–speed pulse output, the maximum frequency hits 100kHz. As open–collector output, its specification is the same as that of DO1
Relay output	T/A–T/B	NC terminal	Contact driving capacity: 250 VAC, 3A, COSΦ=0.4 30VDC, 1A Applying to Overvoltage Category II circuit
	T/A–T/C	NO terminal	
Auxiliary interface	J12	Extension card interface	Interface of 28–core terminal and optional cards (I/O extension card, PLC card and various bus cards)
	J3	PG card interface	OC, differential, UVW and resolver can be selected.
	J7	External operation panel interface	Connect to external operation panel.

Chapter 3 Operation and Display

3.1 Operation Panel

You can modify the parameters, monitor the working status and start or stop the IST200 by operating the operation panel, as shown in the following figure.
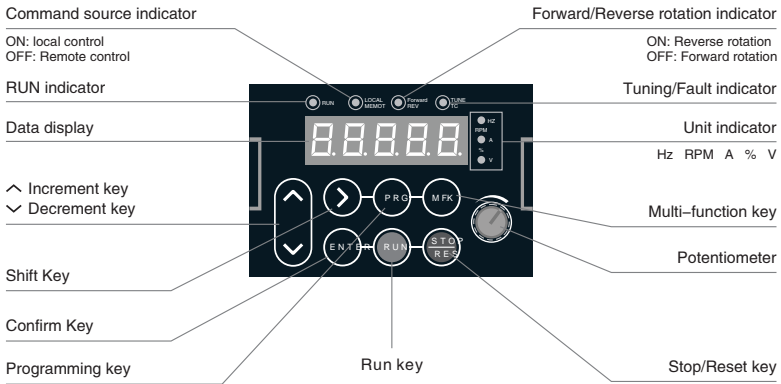
Figure 3−1 Diagram of the operation panel

1) Description of Indicators

● RUN

  ON indicates that the AC drive is in the running state, and OFF indicates that the AC drive is in the stop state.

● LOCAL/REMOT

  It indicates whether the AC drive is operated by means of operation panel, terminals or communication

● FWD/REV

  ON indicates forward rotation, and OFF indicates reverse rotation.

● TUNE/TC

  When the indicator is ON, it indicates torque control mode. When the indicator is blinking slowly, it indicates the auto−tuning state. When the indicator is blinking quickly, it indicates the fault state.

2) Description of Unit Indicators

  Hz: Frequency   A: Current   V: Voltage   RMP(Hz+A): rotational speed   % (A+V): percentage

3) Description of Digital Display

The 5–digit LED display is able to display the set frequency, output frequency,monitoring data and fault codes.

4) Description of Keys on the Operation Panel

Table 3–1 Description of keys on the operation panel

Key	Name	Function
P R G	Progtamming	Enter or exit Level I menu.
E N T E R	Confirm	Enter the menu interfaces level by level, and confirm the parameter setting.
∧	Increment	Increase data or function code.
∨	Decrement	Decrease data or function code.
❯	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 operation panel control mode.
STO RES	Stop/Reset	Stop the AC drive when it is in the running state and perform the reset operation when it is in the fault state. The functions of this key are restricted in F7–02.
MFK	Multifunction	Perform function switchover (such as quick switchover of command source or direction) according to the setting of F7–01.

Chapter4 Standard Function Parameters

If FP−00 is set to a non−zero number, parameter protection is enabled. You must enter thecorrect user password to enter the menu.To cancel the password protection function, enter with password and set FP−00 to 0.

Group F and Group A are standard function parameters. Group U includes the monitoring function parameters.

The symbols in the function code table are described as follows:

"☆": The parameter can be modified when the AC drive is in either stop or running state.

"★": The parameter cannot be modified when the AC drive is in the running state.

"●": The parameter is the actually measured value and cannot be modified.

" * ": The parameter is factory parameter and can be set only by the manufacturer.

Function Code	Parameter Name	Setting Range	Default	Property
Group F0: Basic Parameters				
F0−00	G/P type display	1: G type (constant torque load) 2: P type (variable torque load e.g. fan and pump)	Model dependent	●
F0−01	Motor 1 control mode	0: Sensorless flux vector control (SFVC) 1: Closed−loop vector control (CLVC) 2: Voltage/Frequency (V/F) control	0	★
F0−02	Command source selection	0: Operation panel control (LED off) 1: Terminal control (LED on) 2: Communication control (LED blinking)	0	☆
F0−03	Main frequency source X selection	0: Digital setting (non−retentive at power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: AI2 4: AI3 5: Pulse setting (DI5) 6: Multi−reference 7: Simple PLC 8: PID 9: Communication setting 10. Panel potentiometer	0	★
F0−04	Auxiliary frequency source Y selection	The same as F0−03 (Main frequency source X selection)	0	★
F0−05	Range of auxiliary frequency Y for X and Y operation	0: Relative to maximum frequency 1: Relative to main frequency X	0	☆
F0−06	Range of auxiliary frequency Y for X and Y operation	0%−150%	100%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F0: Basic Parameters				
F0–07	Frequency source selection	Unit's digit (Frequency source selection) 0: Main frequency source X 1: X and Y operation (operation relationship determined by ten's digit) 2: Switchover between X and Y 3: Switchover between X and "X and Y operation" 4: Switchover between Y and "X and Y operation" Ten's digit (X and Y operation relationship) 0: X+Y 1: X–Y 2: Maximum 3: Minimum	00	☆
F0–08	Preset frequency	0.00 to maximum frequency (valid when frequency source is digital setting)	50.00Hz	☆
F0–09	Rotation direction	0: Same direction 1: Reverse direction	0	☆
F0–10	Maximum frequency	50.00–320.00Hz	50.00Hz	★
F0–11	Source of frequency upper limit	0: Set by F0–12 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication setting	0	★
F0–12	Frequency upper limit	Frequency lower limit (F0–14) to maximum frequency (F0–10)	50.00Hz	☆
F0–13	Maximum frequency	0.00 Hz to maximum frequency (F0–10)	0.00Hz	☆
F0–14	Frequency lower limit	0.00 Hz to frequency upper limit (F0–12)	0.00Hz	☆
F0–15	Carrier frequency	0.5–16.0 kHz	Model dependent	☆
F0–16	Carrier frequency adjustment with temperature	0: No 1: Yes	1	☆
F0–17	Acceleration time 1	0–65000s	Model dependent	☆
F0–18	Deceleration time 1	0–65000s	Model dependent	☆
F0–19	Acceleration/Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
F0–21	Frequency offset of auxiliary frequency source for X and Y operation	0.00 Hz to maximum frequency (F0–10)	0.00Hz	☆
F0–22	Frequency reference resolution	1: 0.1 Hz 2: 0.01 Hz	2	★

Function Code	Parameter Name	Setting Range	Default	Property
Group F0: Basic Parameters				
F0–23	Retentive of digital setting frequency upon power failure	0: Not retentive 1: Retentive	2	☆
F0–24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2 2: Motor parameter group 3 3: Motor parameter group 4	0	★
F0–25	Acceleration/Deceleration time base frequency	0: Maximum frequency (F0–10) 1: Set frequency 2: 100 Hz	0	★
F0–26	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Set frequency	0	★
F0–27	Binding command source to frequency source	Unit's digit (Binding operation panel command to frequency source) 0: No binding 1: Frequency source by digital setting 2: AI1 3: AI2 4: AI3 5: Pulse setting (DI5) 6: Multi–reference 7: Simple PLC 8: PID 9: Communication setting Ten's digit (Binding terminal command to frequency source) 0–9, same as unit's digit Hundred's digit (Binding communication command to frequency source) 0–9, same as unit's digit Thousand's digit (Binding Automatic operation to frequency source) 0–9, same as unit's digit	0000	☆
F0–28	Serial communication protocol	0: Modbus protocol 1: Profibus–DP bridge 2: CAN bridge	0	☆
Group F1: Motor 1 Parameters				
F1–00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
F1–01	Rated motor power	0.1–1000.0 kW	Model dependent	★
F1–02	Rated motor voltage	1–2000 V	Model dependent	★
F1–03	Rated motor current	0.01–655.35 A (AC drive power ≤55 kW) 0.1–6553.5 A (AC drive power >55 kW)	Model dependent	★
F1–04	Rated motor frequency	0.01 Hz to maximum frequency	Model dependent	★

Function Code	Parameter Name	Setting Range	Default	Property
Group F1: Motor 1 Parameters				
F1–05	Rated motor rotational speed	1–65535 RPM	Model dependent	★
F1–06	Stator resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ≤ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
F1–07	Rotor resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ≤ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
F1–08	Leakage inductive reactance (asynchronous motor)	0.01–655.35 mH (AC drive power ≤ 55 kW) 0.001–65.535 mH (AC drive power > 55 kW)	Model dependent	★
F1–09	Mutual inductive reactance (asynchronous motor)	0.1–6553.5 mH (AC drive power ≤ 55 kW) 0.01–655.35 mH (AC drive power > 55 kW)	Model dependent	★
F1–10	No–load current (asynchronous motor)	0.01 to F1–03 (AC drive power ≤ 55 kW) 0.1 to F1–03 (AC drive power > 55 kW)	Model dependent	★
F1–27	Encoder pulses per revolution	1–65535	1024	★
F1–28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver 3: SIN/COS encoder 4: Wire–saving UVW encoder	0	★
F1–30	A/B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★
F1–31	Encoder installation angle	0.0–359.9°	0.0°	★
F1–32	U, V, W phase sequence of UVW encoder	0: Forward 1: Reverse	0	★
F1–33	UVW encoder angle offset	0.0–359.9°	0.0°	★
F1–34	Number of pole pairs of resolver	1–65535	1	★
F1–36	Encoder wire–break fault detection time	0.0s: No action 0.1–10.0s	0.0s	★
F1–37	Tuning selection	0: No auto–tuning 1: Asynchronous motor static tuning 2: Asynchronous motor complete tuning	0	★
Group F2: Vector Control Parameters				
F2–00	Speed loop proportional gain 1	0–100	30	☆
F2–01	Speed loop integral time 1	0.01–10.00s	0.50s	☆
F2–02	Switchover frequency 1	0.00 to F2–05	5.00 Hz	☆
F2–03	Speed loop proportional gain 2	0–100	20	☆
F2–04	Speed loop integral time 2	0.01–10.00s	1.00s	☆
F2–05	Switchover frequency 2	F2–02 to maximum output frequency	10.00 Hz	☆
F2–06	Vector control slip gain	50%–200%	100%	☆
F2–07	Time constant of speed loop filter	0.000–0.100s	0.000s	★

Function Code	Parameter Name	Setting Range	Default	Property
Group F2: Vector Control Parameters				
F2–08	Vector control over–excitation gain	0–200	64	☆
F2–09	Torque upper limit source in speed control mode	0: Function code F2–10 setting 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication setting 6. MIN (AI1,AI2) 7. MAX (AI1,AI2)	0	☆
F2–10	Digital setting of torque upper limit in speed control mode	0.0%–200.0%	150.0%	☆
F2–13	Excitation adjustment proportional gain	0–60000	2000	☆
F2–14	Excitation adjustment integral gain	0–60000	1300	☆
F2–15	Torque adjustment proportional gain	0–60000	2000	☆
F2–16	Torque adjustment integral gain	0–60000	1300	☆
F2–17	Speed loop integral property	Unit's digit: integral separation 0: Disabled 1: Enabled	0	☆
Group F3: V/F Control Parameters				
F3–00	V/F curve setting	0: Linear V/F 1: Multi–point V/F 2: Square V/F 3: 1.2–power V/F 4: 1.4–power V/F 6: 1.6–power V/F 8: 1.8–power V/F 9: Reserved 10: V/F complete separation 11: V/F half separation	0	★
F3–01	Torque boost	0.0% (fixed torque boost) 0.1%–30.0%	Model dependent	☆
F3–02	Cut–off frequency of torque boost	0.00 Hz to maximum output frequency	50.00 Hz	★
F3–03	Multi–point V/F frequency 1 (F1)	0.00 Hz to F3–05	0.00 Hz	★
F3–04	Multi–point V/F voltage 1 (V1)	0.0%–100.0%	0.0%	★
F3–05	Multi–point V/F frequency 2 (F2)	F3–03 to F3–07	0.00 Hz	★

Function Code	Parameter Name	Setting Range	Default	Property
Group F3: V/F Control Parameters				
F3–06	Multi–point V/F voltage 2 (V2)	0.0%–100.0%	0.0%	★
F3–07	Multi–point V/F frequency 3 (F3)	F3–05 to motor rated frequency (F1–04)	0.00 Hz	★
F3–08	Multi–point V/F voltage 3 (V3)	0.0%–100.0%	0.0%	★
F3–09	V/F slip compensation gain	0.0%–200.0%	0.0%	☆
F3–10	V/F over–excitation gain	0–200	64	☆
F3–11	V/F oscillation suppression Gain	0–100	Model dependent	☆
F3–12	Mode selection for oscillation suppression	0–4	3	★
F3–13	Voltage source for V/F separation	0: Digital setting (F3–14) 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Multi–reference 6: Simple PLC 7: PID 8: Communication setting 100.0% corresponds to the rated motor voltage (F1–02, A4–02, A5–02, A6–02).	0	☆
F3–14	Voltage digital setting for V/F separation	0V to rated motor voltage	0V	☆
F3–15	Voltage rise time of V/F separation	0.0–1000.0s It indicates the time for the voltage rising from 0V to rated motor voltage.	0.0s	☆
Group F4: Input Terminals				
F4–00	DI1 function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three–line control	1	★
F4–01	DI2 function selection	4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop	4	★
F4–02	DI3 function selection	9: Fault reset (RESET) 10: RUN pause 11: Normally open (NO) input of external fault 12: Multi–reference terminal 1 13: Multi–reference terminal 2	9	★
F4–03	DI4 function selection	14: Multi–reference terminal 3 15: Multi–reference terminal 4 16: Terminal 1 for acceleration/deceleration time selection	12	★

Function Code	Parameter Name	Setting Range	Default	Property
Group F4: Input Terminals				
F4–04	DI5 function selection	17: Terminal 2 for acceleration/deceleration time selection 18: Frequency source switchover 19: UP and DOWN setting clear (terminal, operation panel) 20: Command source switchover terminal 1	0	★
F4–05	DI6 function selection	21: Acceleration/Deceleration prohibited 22: PID pause 23: PLC status reset 24: Swing pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset	0	★
F4–06	DI7 function selection	29: Torque control prohibited 30: Pulse input (enabled only for DI5) 31:Reserved 32: Immediate DC braking 33: Normally closed (NC) input of external fault 34: Frequency modification forbidden	0	★
F4–07	DI8 function selection	35: Reverse PID action direction 36: External STOP terminal 1 37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency source X and preset frequency 40: Switchover between auxiliary frequency source Y and preset frequency	0	★
F4–08	DI9 function selection	41: Motor selection terminal 1 42: Motor selection terminal 2 43: PID parameter switchover 44: User–defined fault 1 45: User–defined fault 2 46: Speed control/Torque control switchover 47: Emergency stop	0	★
F4–09	DI10 function selection	48: External STOP terminal 2 49: Deceleration DC braking 50: Clear the current running time 51: Switchover between two–line mode and three–line mode 52–59: Reserved	0	★
F4–10	DI filter time	0.000–1.000s	0.010s	☆
F4–11	Terminal command mode	0: Two–line mode 1 1: Two–line mode 2 2: Three–line mode 1 3: Three–line mode 2	0.010s	★
F4–12	Terminal UP/DOWN rate	0.01–65.535 Hz/s	1.00 Hz/s	☆
F4–13	AI curve 1 minimum input	0.00 V to F4–15	0.00 V	☆
F4–14	Corresponding setting of AI curve 1 minimum input	−100.00%–100.0%	0.0%	☆
F4–15	AI curve 1 maximum input	F4–13 to 10.00 V	10.00 V	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F4: Input Terminals				
F4–16	Corresponding setting of AI curve 1 maximum input	−100.00%–100.0%	100.0%	☆
F4–17	AI1 filter time	0.00–10.00s	0.10s	☆
F4–18	AI curve 2 minimum input	0.00 V to F4–20	0.00 V	☆
F4–19	Corresponding setting of AI curve 2 minimum input	−100.00%–100.0%	0.0%	☆
F4–20	AI curve 2 maximum input	F4–18 to 10.00 V	10.00 V	☆
F4–21	Corresponding setting of AI curve 2 maximum input	−100.00%–100.0%	100.0%	☆
F4–22	AI2 filter time	0.00–10.00s	0.10s	☆
F4–23	AI curve 3 minimum input	0.00 V to F4–25	0.00 V	☆
F4–24	Corresponding setting of AI curve 3 minimum input	−100.00%–100.0%	0.0%	☆
F4–25	AI curve 3 maximum input	F4–23 to 10.00 V	10.00 V	☆
F4–26	Corresponding setting of AI curve 3 maximum input	−100.00%–100.0%	100.0%	☆
F4–27	AI3 filter time	0.00–10.00s	0.10s	☆
F4–28	Pulse minimum input	0.00 kHz to F4–30	0.00 kHz	☆
F4–29	Corresponding setting of pulse minimum input	−100.00%–100.0%	0.0%	☆
F4–30	Pulse maximum input	F4–28 to 50.00 kHz	50.00 kHz	☆
F4–31	Corresponding setting of pulse maximum input	−100.00%–100.0%	100.0%	☆
F4–32	Pulse filter time	0.00–10.00s	0.10s	☆
F4–33	AI curve selection	Unit's digit (AI1 curve selection) Curve 1 (2 points, see F4–13 to F4–16) Curve 2 (2 points, see F4–18 to F4–21) Curve 3 (2 points, see F4–23 to F4–26) Curve 4 (4 points, see A6–00 to A6–07) Curve 5 (4 points, see A6–08 to A6–15) Ten's digit (AI2 curve selection) Curve 1 to curve 5 (same as AI1) Hundred's digit (AI3 curve selection) Curve 1 to curve 5 (same as AI1)	321	☆
F4–34	Setting for AI less than minimum input	Unit's digit (Setting for AI1 less than minimum input) 0: Minimum value 1: 0.0% Ten's digit (Setting for AI2 less than minimum input) 0, 1 (same as AI1) Hundred's digit (Setting for AI3 less than minimum input) 0, 1 (same as AI1)	000	☆
F4–35	DI1 delay time	0.0–3600.0s	0.0s	★

Function Code	Parameter Name	Setting Range	Default	Property
Group F4: Input Terminals				
F4–36	DI2 delay time	0.0–3600.0s	0.0s	★
F4–37	DI3 delay time	0.0–3600.0s	0.0s	★
F4–38	DI valid mode selection 1	0: High level valid 1: Low level valid Unit's digit (DI1 valid mode) Ten's digit (DI2 valid mode) Hundred's digit (DI3 valid mode) Thousand's digit (DI4 valid mode) Ten thousand's digit (DI5 valid mode)	00000	★
F4–39	DI valid mode selection 2	0: High level valid 1: Low level valid Unit's digit (DI6 valid mode) Ten's digit (DI7 valid mode) Hundred's digit (DI8 state) Thousand's digit (DI9 valid mode) Ten thousand's digit (DI10 valid mode)	00000	★
Group F5: Output Terminals				
F5–00	FM output mode selection	0: Pulse output (FMP) 1: Switch signal output (FMR)	0	☆
F5–01	FMR Output function selection	0: No output 1: AC drive running 2: Fault output (stop) 3: Frequency–level detection FDT1 output 4: Frequency reached 5: Zero–speed running (no output at stop) 6: Motor overload pre–warning 7: AC drive overload pre–warning 8: Set count value reached 9: Designated count value reached 10: Length reached	0	☆
F5–02	Control panel Relay function selection (T/A–T/B–T/C)	11: PLC cycle complete 12: Accumulative running time reached 13: Frequency limited 14: Torque limited 15: Ready for RUN 16: AI1 larger than AI2 17: Frequency upper limit reached 18: Frequency lower limit reached (no output at stop) 19: Undervoltage state output 20: Communication setting	2	☆
F5–03	Extension card relay Output function selection (P/A–P/B–P/C)	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 27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Timing reached	0	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F5: Output Terminals				
F5–04	DO1 Output function selection	31: AI1 input limit exceeded 32: Load becoming 0 33: Reverse running 34: Zero current state 35: Module temperature reached 36: Software current limit exceeded 37: Frequency lower limit reached (having output at stop)	1	☆

F5–05	Extension card DO2 Output function selection	38: Alarm output
		39: Motor overheat warning
		40: Current running time reached
		41: Fault output
		    (There is no output if it is the coast to
		    stop fault and undervoltage occurs.)
			4	☆

F5–06	FMP Output function selection	0: Running frequency 1: Set frequency 2: Output current 3: Output torque (absolute value) 4: Output power	0	☆
F5–07	AO1 Output function selection	5: Output voltage 6: Pulse input 7: AI1 8: AI2 9: AI3 10: Length 11: Count value	0	☆
F5–08	Extension card AO2 Output function selection	12: Communication setting 13: Motor rotational speed 14: Output current 15: Output voltage 16: Output torque (actual value)	1	☆
F5–09	Maximum FMP output frequency	0.01–100.00 kHz	50.00 kHz	☆
F5–10	AO1 offset coefficient	−100.0%–100.0%	0.0%	☆
F5–11	AO1 gain	−10.00–10.00	1.00	☆
F5–12	AO2 offset coefficient	−100.0%–100.0%	0.00%	☆
F5–13	AO2 gain	−10.00–10.00	1.00	☆
F5–17	FMR output delay time	0.0–3600.0s	0.0s	☆
F5–18	Relay 1 output delay time	0.0–3600.0s	0.0s	☆
F5–19	Relay 2 output delay time	0.0–3600.0s	0.0s	☆
F5–20	DO1 output delay time	0.0–3600.0s	0.0s	☆
F5–21	DO2 output delay time	0.0–3600.0s	0.0s	☆
F5–22	DO valid mode selection	0: Positive logic 1: Negative logic Unit's digit (FMR valid mode) Ten's digit (Relay 1 valid mode) Hundred's digit (Relay 2 valid mode) Thousand's digit (DO1 valid mode) Ten thousand's digit (DO2 valid mode)	00000	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F6: Start / Stop Control				
F6–00	Start mode	0: Direct start 1: Rotational speed tracking restart 2: Pre–excited start (asynchronous motor)	0	☆
F6–01	Rotational speed tracking mode	0: From frequency at stop 1: From zero speed 2: From maximum frequency	0	★
F6–02	Rotational speed tracking speed	1–100	20	☆
F6–03	Startup frequency	0.00–10.00 Hz	0.00 Hz	☆
F6–04	Startup frequency holding time	0.0–100.0s	0.0s	☆
F6–05	Startup DC braking current/ Pre–excited current	0%–100%	0%	☆
F6–06	Startup DC braking time/ Pre–excited time	0.0–100.0s	0.0s	☆
F6–07	Acceleration/Deceleration mode	0: Linear acceleration/deceleration 1: S–curve acceleration/deceleration A 2: S–curve acceleration/deceleration B	0	★
F6–08	Time proportion of S–curve start segment	0.0% to (100.0%–F6–09)	30.0%	★
F6–09	Time proportion of S–curve end segment	0.0% to (100.0%–F6–08)	30.0%	★
F6–10	Stop mode	0: Decelerate to stop 1: Coast to stop	0	☆
F6–11	Initial frequency of stop DC braking	0.00 Hz to maximum frequency	0.00 Hz	☆
F6–12	Waiting time of stop DC braking	0.0–100.0s	0.0s	☆
F6–13	Stop DC braking current	0%–100%	0%	☆
F6–14	Stop DC braking time	0.0–100.0s	0.0s	☆
F6–15	Brake use ratio	0%–100%	100%	☆
Group F7: Operation Panel and Display				
F7–01	MF.K Key function selection	0: MF.K key disabled 1: Switchover between operation panel control and remote command control (terminal or communication) 2: Switchover between forward rotation and reverse rotation 3: Forward JOG 4: Reverse JOG	0	★
F7–02	STOP/RESET key function	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	1	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F7: Operation Panel and Display				
F7–03	LED display running parameters 1	0000–FFFF Bit00: Running frequency 1 (Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status Bit08: DO output status Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆
F7–04	LED display running parameters 2	0000–FFFF Bit00: PID feedback Bit01: PLC stage Bit02: Pulse setting frequency (kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: AI1 voltage before correction (V) Bit06: AI2 voltage before correction (V) Bit07: AI3 voltage before correction (V) Bit08: Linear speed Bit09: Current power–on time (Hour) Bit10: Current running time (Min) Bit11: Pulse setting frequency (Hz) Bit12: Communication setting value Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)	0	☆
F7–05	LED display stop parameters	0000–FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input status Bit03: DO output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: Pulse setting frequency (kHz)	33	☆
F7–06	Load speed display coefficient	0.0001–6.5000	1.0000	☆
F7–07	Heatsink temperature of inverter module	0.0–100.0℃	–	●

Function Code	Parameter Name	Setting Range	Default	Property
Group F7: Operation Panel and Display				
F7–08	Temporary software version	0.0℃–100.0℃	–	●
F7–09	Accumulative running time	0–65535 h	–	●
F7–10	Product number	–	–	●
F7–11	Software version	–	–	●
F7–12	Number of decimal places for load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	●
F7–13	Accumulative power–on time	0–65535 h	–	●
F7–14	Accumulative power consumption	0–65535 kWh	–	●
Group F8: Auxiliary Functions				
F8–00	JOG running frequency	0.00 Hz to maximum frequency	2.00 Hz	☆
F8–01	JOG acceleration time	0.0–6500.0s	20.0s	☆
F8–02	JOG deceleration time	0.0–6500.0s	20.0s	☆
F8–03	Acceleration time 2	0.0–6500.0s	Model dependent	☆
F8–04	Deceleration time 2	0.0–6500.0s	Model dependent	☆
F8–05	Acceleration time 3	0.0–6500.0s	Model dependent	☆
F8–06	Deceleration time 3	0.0–6500.0s	Model dependent	☆
F8–07	Acceleration time 4	0.0–6500.0s	Model dependent	☆
F8–08	Deceleration time 4	0.0–6500.0s	Model dependent	☆
F8–09	Jump frequency 1	0.00 Hz to maximum frequency	0.00 Hz	☆
F8–10	Jump frequency 2	0.00 Hz to maximum frequency	0.00 Hz	☆
F8–11	Frequency jump amplitude	0.00 Hz to maximum frequency	0.01 Hz	☆
F8–12	Forward/Reverse rotation dead–zone time	0.0–3000.0s	0.0s	☆
F8–13	Reverse control	0: Enabled 1: Disabled	0	☆
F8–14	Running mode when set frequency lower than frequency lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	0	☆
F8–15	Droop control	0.00–10.00 Hz	0.00 Hz	☆
F8–16	Accumulative power–on time threshold	0–65000 h	0h	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F8: Auxiliary Functions				
F8–17	Accumulative running time threshold	0–65000 h	0h	☆
F8–18	Startup protection	0: No 1: Yes	0	☆
F8–19	Frequency detection value (FDT1)	0.00 Hz to maximum frequency	50.00 Hz	☆
F8–20	Frequency detection hysteresis (FDT1)	0.0%–100.0% (FDT1 level)	5.0%	☆
F8–21	Detection range of frequency reached	0.00–100% (maximum frequency)	0.0%	☆
F8–22	Jump frequency during acceleration/deceleration	0: Disabled1: Enabled	0	☆
F8–25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00 Hz to maximum frequency	0.00 Hz	☆
F8–26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00 Hz to maximum frequency	0.00 Hz	☆
F8–27	Terminal JOG preferred	0: Disabled1: Enabled	0	☆
F8–28	Frequency detection value (FDT2)	0.00 to maximum frequency	50.00 Hz	☆
F8–29	Frequency detection hysteresis (FDT2)	0.0%–100.0% (FDT2 level)	5.0%	☆
F8–30	Any frequency reaching detection value 1	0.00 Hz to maximum frequency	50.00 Hz	☆
F8–31	Any frequency reaching detection amplitude 1	0.0%–100.0% (maximum frequency)	0.0%	☆
F8–32	Any frequency reaching detection value 2	0.00 Hz to maximum frequency	50.00 Hz	☆
F8–33	Any frequency reaching detection amplitude 2	0.0%–100.0% (maximum frequency)	0.0%	☆
F8–34	Zero current detection level	0.0%–300.0% (rated motor current)	5.0%	☆
F8–35	Zero current detection delay time	0.01–600.00s	0.10s	☆
F8–36	Output overcurrent threshold	0.0% (no detection) 0.1%–300.0% (rated motor current)	200.0%	☆
F8–37	Output overcurrent detection delay time	0.00–600.00s	0.00s	☆
F8–38	Any current reaching 1	0.0%–300.0% (rated motor current)	100.0%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F8: Auxiliary Functions				
F8–39	Any current reaching 1 amplitude	0.0%–300.0% (rated motor current)	0.0%	☆
F8–40	Any current reaching 2	0.0%–300.0% (rated motor current)	100.0%	☆
F8–41	Any current reaching 2 amplitude	0.0%–300.0% (rated motor current)	0.0%	☆
F8–42	Timing function	0: Disabled 1: Enabled	0	☆
F8–43	Timing duration source	0: F8–44 1: AI1 2: AI2 3: AI3 (100% of analog input corresponds to the value of F8–44)	0	☆
F8–44	Timing duration	0.0–6500.0 min	0.0 min	☆
F8–45	AI1 input voltage lower limit	0.00 V to F8–46	3.10 V	☆
F8–46	AI1 input voltage upper limit	F8–45 to 10.00 V	6.80 V	☆
F8–47	Module temperature threshold	0–100℃	75℃	☆
F8–48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	☆
F8–49	Wakeup frequency	Dormant frequency (F8–51) to maximum frequency (F0–10)	0.00 Hz	☆
F8–50	Wakeup delay time	0.0–6500.0s	0.0s	☆
F8–51	Dormant frequency	0.00 Hz to wakeup frequency (F8–49)	0.00 Hz	☆
F8–52	Dormant delay time	0.0–6500.0s	0.0s	☆
F8–53	Current running time reached	0.0–6500.0 min	0.0 min	☆
Group F9: Fault and Protection				
F9–00	Motor overload protection selection	0: Disabled 1: Enabled	1	☆
F9–01	Motor overload protection gain	0.20–10.00	1.00	☆
F9–02	Motor overload warning coefficient	50%–100%	80%	☆
F9–03	Overvoltage stall gain	0 (no stall overvoltage)–100	0	☆
F9–04	Overvoltage stall protective voltage	120%–150%	130%	☆
F9–05	Overcurrent stall gain	0–100	20	☆
F9–06	Overcurrent stall protective current	100%–200%	150%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F9: Fault and Protection				
F9–07	Short–circuit to ground upon power–on	0: Disabled 1: Enabled	1	☆
F9–09	Fault auto reset times	0–20	0	☆
F9–10	DO action during fault auto reset	0: Not act 1: Act	0	☆
F9–11	Time interval of fault auto reset	0.1s–100.0s	1.0s	☆
F9–12	Input phase loss protection/ contactor energizing protection selection	Unit's digit: Input phase loss protection Ten's digit: Contactor energizing protection 0: Disabled 1: Enabled	11	☆
F9–13	Output phase loss protection selection	0: Disabled 1: Enabled	1	☆
F9–14	1st fault type	0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Buffer resistance overload 9: Undervoltage 10: AC drive overload 11: Motor overload 12:Power input phase loss	–	●
F9–15	2nd fault type	13: Power output phase loss 14: Module overheat 15: External equipment fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto–tuning fault 20: Encoder/PG card fault 21: EEPROM read–write fault 22: AC drive hardware fault 23: Short circuit to ground 24: Reserved 25: Reserved	–	●
F9–16	3rd (latest) fault type	26: Accumulative running time reached 27: User–defined fault 1 28: User–defined fault 2 29: Accumulative power–on time reached 30: Load becoming 0 31: PID feedback lost during running 40: With–wave current limit fault 41: Motor switchover fault during running 42: Too large speed deviation 43: Motor over–speed 45: Motor overheat 51: Initial position fault	–	●

Function Code	Parameter Name	Setting Range	Default	Property
Group F9: Fault and Protection				
F9–17	Frequency upon 3rd fault	–	–	●
F9–18	Current upon 3rd fault	–	–	●
F9–19	Bus voltage upon 3rd fault	–	–	●
F9–20	DI status upon 3rd fault	–	–	●
F9–21	Output terminal status upon 3rd fault	–	–	●
F9–22	AC drive status upon 3rd fault	–	–	●
F9–23	Power–on time upon 3rd fault	–	–	●
F9–24	Running time upon 3rd fault	–	–	●
F9–27	Frequency upon 2nd fault	–	–	●
F9–28	Current upon 2nd fault	–	–	●
F9–29	Bus voltage upon 2nd fault	–	–	●
F9–30	DI status upon 2nd fault	–	–	●
F9–31	Output terminal status upon 2nd fault	–	–	●
F9–32	AC drive status upon 2nd fault	–	–	●
F9–33	Power–on time upon 2nd fault	–	–	●
F9–34	Running time upon 2nd fault	–	–	●
F9–37	Frequency upon 1nd fault	–	–	●
F9–38	Current upon 1nd fault	–	–	●
F9–39	Bus voltage upon 1nd fault	–	–	●
F9–40	DI status upon 1nd fault	–	–	●
F9–41	Output terminal status upon 1nd fault	–	–	●
F9–42	AC drive status upon 1nd fault	–	–	●
F9–43	Power–on time upon 1nd fault	–	–	●
F9–44	Running time upon 1nd fault	–	–	●

Function Code	Parameter Name	Setting Range	Default	Property
Group F9: Fault and Protection				
F9–47	Fault protection action selection 1	Unit's digit (Motor overload, Err11) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Ten's digit (Power input phase loss, Err12) Hundred's digit (Power output phase loss, Err13) Thousand's digit (External equipment fault, Err15) Ten thousand's digit (Communication fault, Err16)	00000	☆
F9–48	Fault protection action selection 2	Unit's digit (Encoder fault, Err20) 0: Coast to stop Ten's digit (EEPROM read–write fault, Err21) 0: Coast to stop 1: Stop according to the stop mode Hundred's digit (Reserved) Thousand's digit (Motor overheat, Err25) Ten thousand's digit (Running time reactor, Err26)	00000	☆
F9–49	Fault protection action selection 3	Unit's digit (User–defined fault 1, Err27) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Ten's digit (User–defined fault 2, Err28) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Hundred's digit (Accumulative power–on time reached, Err29) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Thousand's digit (Load becoming 0, Err30) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run at 7% of rated motor frequency and resume to the set frequency if the load recovers Ten thousand's digit (PID feedback lost during running, Err31) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	00000	☆
F9–50	Fault protection action selection 4	Unit's digit (Too large speed deviation, Err42) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Ten's digit (Motor over–speed, Err43) Hundred's digit (Initial position fault, Err51)	00000	☆
F9–54	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Set frequency 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	00000	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group F9: Fault and Protection				
F9–55	Backup frequency upon abnormality	6.0%–100.0% (maximum Frequency F0–10)	100.0%	☆
F9–56	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	1	☆
F9–57	Motor overheat protection threshold	0–200℃	110℃	☆
F9–58	Motor overheat warning threshold	0–200℃	90℃	☆
F9–59	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	0	☆
F9–60	Reserve	F9–62–100.0%	100.0%	☆
F9–61	Voltage rally judging time at instantaneous power failure	0.00–100.00s	0.50s	☆
F9–62	Action judging voltage at instantaneous power failure	60.0%–100.0% (standard bus voltage)	80.0%	☆
F9–63	Protection upon load becoming 0	0: Disabled 1: Enabled	0	☆
F9–64	Detection level of load becoming 0	0.0%–100.0%	10.0%	☆
F9–65	Detection time of load becoming 0	0.0–60.0s	1.0s	☆
F9–67	Over–speed detection value	0.0%–50.0% (maximum frequency)	20.0%	☆
F9–68	Over–speed detection time	0.0–60.0s	5.0s	☆
F9–69	Detection value of too large speed deviation	0.0%–50.0% (maximum frequency)	20.0%	☆
F9–70	Detection time of too large speed deviation	0.0–60.0s	0.0s	☆
Group FA: Process Control PID Function				
FA–00	PID setting source	0: FA–01 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication setting 6: Multi–reference	0	☆
FA–01	PID digital setting	0.0%–100.0%	50.0%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FA: Process Control PID Function				
FA–02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 – AI2 4: Pulse setting (DI5) 5: Communication setting 6: AI1 + AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	☆
FA–03	PID action direction	0: Forward action 1: Reverse action	0	☆
FA–04	PID setting feedback range	0–65535	1000	☆
FA–05	Proportional gain Kp1	0.0–100.0	20.0	☆
FA–06	Integral time Ti1	0.01–10.00s	2.00s	☆
FA–07	Differential time Td1	0.00–10.000	0.000s	☆
FA–08	Cut–off frequency of PID reverse rotation	0.00 to maximum frequency	2.00 Hz	☆
FA–09	PID deviation limit	0.0%–100.0%	0.0%	☆
FA–10	PID differential limit	0.00%–100.00%	0.10%	☆
FA–11	PID setting change time	0.00–650.00s	0.00s	☆
FA–12	PID feedback filter time	0.00–60.00s	0.00s	☆
FA–13	PID output filter time	0.00–60.00s	0.00s	☆
FA–14	Reserved	–	–	☆
FA–15	Proportional gain Kp2	0.0–100.0	20.0	☆
FA–16	Integral time Ti2	0.01–10.00s	2.00s	☆
FA–17	Differential time Td2	0.000–10.000s	0.000s	☆
FA–18	PID parameter switchover condition	0: No switchover 1: Switchover via DI 2: Automatic switchover based on deviation	0	☆
FA–19	PID parameter switchover deviation 1	0.0% to FA–20	20.0%	☆
FA–20	PID parameter switchover deviation 2	FA–19 to 100.0%	80.0%	☆
FA–21	PID initial value	0.0%–100.0%	0.0%	☆
FA–22	PID initial value holding time	0.00–650.00s	0.00s	☆
FA–23	Maximum deviation between two PID outputs in forward	0.00%–100.00%	1.00%	☆
FA–24	Maximum deviation between two PID outputs in reverse direction	0.00%–100.00%	1.00%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FA: Process Control PID Function				
FA–25	PID integral property	Unit's digit (Integral separated) 0: Invalid 1: Valid Ten's digit (Whether to stop integral operation when the output reaches the limit) 0: Continue integral operation 1: Stop integral operation	00	☆
FA–26	Detection value of PID feedback loss	0.0%: Not judging feedback loss 0.1%–100.0%	0.0%	☆
FA–27	Detection time of PID feedback loss	0.0–20.0s	0.0s	☆
FA–28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	0	☆
Group FB: Swing Frequency, Fixed Length and Count				
FB–00	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	☆
FB–01	Swing frequency amplitude	0.0%–100.0%	0.0%	☆
FB–02	Jump frequency amplitude	0.0%–50.0%	0.0%	☆
FB–03	Swing frequency cycle	0.0–3000.0s	10.0s	☆
FB–04	Triangular wave rising time coefficient	0.1%–100.0%	50.0%	☆
FB–05	Set length	0–65535 m	1000 m	☆
FB–06	Actual length	0–65535 m	0m	☆
FB–07	Number of pulses per meter	0.1–6553.5	100.0	☆
FB–08	Set count value	1–65535	1000	☆
FB–09	Designated count value	1–65535	1000	☆
Group FC: Multi–Reference and Simple PLC Function				
FC–00	Reference 0	–100.0%–100.0%	0.0%	☆
FC–01	Reference 1	–100.0%–100.0%	0.0%	☆
FC–02	Reference 2	–100.0%–100.0%	0.0%	☆
FC–03	Reference 3	–100.0%–100.0%	0.0%	☆
FC–04	Reference 4	–100.0%–100.0%	0.0%	☆
FC–05	Reference 5	–100.0%–100.0%	0.0%	☆
FC–06	Reference 6	–100.0%–100.0%	0.0%	☆
FC–07	Reference 7	–100.0%–100.0%	0.0%	☆
FC–08	Reference 8	–100.0%–100.0%	0.0%	☆
FC–09	Reference 9	–100.0%–100.0%	0.0%	☆
FC–10	Reference 10	–100.0%–100.0%	0.0%	☆
FC–11	Reference 11	–100.0%–100.0%	0.0%	☆
FC–12	Reference 12	–100.0%–100.0%	0.0%	☆
FC–13	Reference 13	–100.0%–100.0%	0.0%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FC: Multi–Reference and Simple PLC Function				
FC–14	Reference 14	–100.0%–100.0%	0.0%	☆
FC–15	Reference 15	–100.0%–100.0%	0.0%	☆
FC–16	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive runs one cycle	0	☆
FC–17	Simple PLC retentive selection	Unit's digit (Retentive upon power failure) 0: No 1: Yes Ten's digit (Retentive upon stop) 0: No 1: Yes	00	☆
FC–18	Running time of simple PLC reference 0	0.0–6500.0s (h)	0.0s (h)	☆
FC–19	Acceleration/deceleration time of simple PLC reference 0	0–3	0	☆
FC–20	Running time of simple PLC reference 1	0.0–6500.0s (h)	0.0s (h)	☆
FC–21	Acceleration/deceleration time of simple PLC reference 1	0–3	0	☆
FC–22	Running time of simple PLC reference 2	0.0–6500.0s (h)	0.0s (h)	☆
FC–23	Acceleration/deceleration time of simple PLC reference 2	0–3	0	☆
FC–24	Running time of simple PLC reference 3	0.0–6500.0s (h)	0.0s (h)	☆
FC–25	Acceleration/deceleration time of simple PLC reference 3	0–3	0	☆
FC–26	Running time of simple PLC reference 4	0.0–6500.0s (h)	0.0s (h)	☆
FC–27	Acceleration/deceleration time of simple PLC reference 4	0–3	0	☆
FC–28	Running time of simple PLC reference 5	0.0–6500.0s (h)	0.0s (h)	☆
FC–29	Acceleration/deceleration time of simple PLC reference 5	0–3	0	☆
FC–30	Running time of simple PLC reference 6	0.0–6500.0s (h)	0.0s (h)	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FC: Multi–Reference and Simple PLC Function				
FC–31	Acceleration/deceleration time of simple PLC reference 6	0–3	0	☆
FC–32	Running time of simple PLC reference 7	0.0–6500.0s (h)	0.0s (h)	☆
FC–33	Acceleration/deceleration time of simple PLC reference 7	0–3	0	☆
FC–34	Running time of simple PLC reference 8	0.0–6500.0s (h)	0.0s (h)	☆
FC–35	Acceleration/deceleration time of simple PLC reference 8	0–3	0	☆
FC–36	Running time of simple PLC reference 9	0.0–6500.0s (h)	0.0s (h)	☆
FC–37	Acceleration/deceleration time of simple PLC reference 9	0–3	0	☆
FC–38	Running time of simple PLC reference 10	0.0–6500.0s (h)	0.0s (h)	☆
FC–39	Acceleration/deceleration time of simple PLC reference 10	0–3	0	☆
FC–40	Running time of simple PLC reference 11	0.0–6500.0s (h)	0.0s (h)	☆
FC–41	Acceleration/deceleration time of simple PLC reference 11	0–3	0	☆
FC–42	Running time of simple PLC reference 12	0.0–6500.0s (h)	0.0s (h)	☆
FC–43	Acceleration/deceleration time of simple PLC reference 12	0–3	0	☆
FC–44	Running time of simple PLC reference 13	0.0–6500.0s (h)	0.0s (h)	☆
FC–45	Acceleration/deceleration time of simple PLC reference 13	0–3	0	☆
FC–46	Running time of simple PLC reference 14	0.0–6500.0s (h)	0.0s (h)	☆
FC–47	Acceleration/deceleration time of simple PLC reference 14	0–3	0	☆
FC–48	Running time of simple PLC reference 15	0.0–6500.0s (h)	0.0s (h)	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FC: Multi–Reference and Simple PLC Function				
FC–49	Acceleration/deceleration time of simple PLC reference 15	0–3	0	☆
FC–50	Time unit of simple PLC running	0: s (second)1:h (hour)	0	☆
FC–51	Reference 0 source	0: Set by FC–00 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: PID 6: Set by preset frequency (F0–08), modified via terminal UP/DOWN	0	☆
Group FD: Communication Parameters				
FD–00	Baud rate	Unit's digit (Modbus baud rate) 0: 300 BPs 1: 600 BPs 2: 1200 BPs 3: 2400 BPs 4: 4800 BPs 5: 9600 BPs 6: 19200 BPs 7: 38400 BPs 8: 57600 BPs 9: 115200 BPs Ten's digit (PROFIBUS–DP baud rate) 0: 115200 BPs 1: 208300 BPs 2: 256000 BPs 3: 512000 Bps Hundred's digit (reserved) Thousand's digit (CANlink baud rate) 0: 20 1: 50 2: 100 3: 125 4: 250 5: 500 6: 1 M	6005	☆
FD–01	Data format	0: No check, data format <8,N,2> 1: Even parity check, data format <8,E,1> 2: Odd Parity check, data format <8,O,1> 3: No check, data format <8,N,1> Valid for Modbus	0	☆
FD–02	Local address	0: Broadcast address 1–247	1	☆
FD–03	Response delay	0–20 ms	2 ms	☆
FD–04	Communication timeout	0.0s (invalid) 0.1–60.0s	0.0s	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FD: Communication Parameters				
FD–05	Modbus protocol selection and PROFIBUS–DP data format	Unit's digit: Modbus protocol 0: Non–standard Modbus protocol 1: Standard Modbus protocol Ten's digit: PROFIBUS–DP data format 0: PPO1 format 1: PPO2 format 2: PPO3 format 3: PPO5 format	30	☆
FD–06	Communication reading current resolution	0: 0.01A 1: 0.1A	0	☆
Group FE: User–defined Function Parameters				
FE–00	User–defined function code 0		F0–10	☆
FE–01	User–defined function code 1		F0–02	☆
FE–02	User–defined function code 2		F0–03	☆
FE–03	User–defined function code 3		F0–07	☆
FE–04	User–defined function code 4		F0–08	☆
FE–05	User–defined function code 5		F0–17	☆
FE–06	User–defined function code 6		F0–18	☆
FE–07	User–defined function code 7	F0–00 to FP–xx A0–00 to Ax–xx U0–xx to U0–xx	F3–00	☆
FE–08	User–defined function code 8		F3–01	☆
FE–09	User–defined function code 9		F4–00	☆
FE–10	User–defined function code 10		F4–01	☆
FE–11	User–defined function code 11		F4–02	☆
FE–12	User–defined function code 12		F5–04	☆
FE–13	User–defined function code 13		F5–07	☆
FE–14	User–defined function code 14		F6–00	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group FE: User–defined Function Parameters				
FE–15	User–defined function code 15		F6–10	☆
FE–16	User–defined function code 16		F0–00	☆
FE–17	User–defined function code 17		F0–00	☆
FE–18	User–defined function code 18		F0–00	☆
FE–19	User–defined function code 19		F0–00	☆
FE–20	User–defined function code 20		F0–00	☆
FE–21	User–defined function code 21		F0–00	☆
FE–22	User–defined function code 22	F0–00 to FP–xx A0–00 to Ax–xx U0–xx to U0–xx	F0–00	☆
FE–23	User–defined function code 23		F0–00	☆
FE–24	User–defined function code 24		F0–00	☆
FE–25	User–defined function code 25		F0–00	☆
FE–26	User–defined function code 26		F0–00	☆
FE–27	User–defined function code 27		F0–00	☆
FE–28	User–defined function code 28		F0–00	☆
FE–29	User–defined function code 29		F0–00	☆
Group FP: Function Code Management				
FP–00	User password	0–65535	0	☆
FP–01	Restore default settings	0: No operation 01: Restore factory settings except motor parameters 02: Clear records	0	★
FP–02	parameter display property	Unit's digit (Group U display selection) 0: Not display 1: Display Ten's digit (Group A display selection) 0: Not display 1: Display	11	★

Function Code	Parameter Name	Setting Range	Default	Property
Group FP: Function Code Management				
FP–03	Individualized parameter display property	Unit's digit (User–defined parameter display selection) 0: Not display 1: Display Ten's digit (User–modified parameter display selection) 0: Not display 1: Display	00	☆
FP–04	Parameter modification property	0: Modifiable 1: Not modifiable	0	☆
Group A0: Torque Control and Restricting Parameters				
A0–00	Speed/Torque control selection	0: Speed control 1: Torque control	0	★
A0–01	Torque setting source in torque control	0: Digital setting (A0–03) 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) Full range of values 1–7 corresponds to the digital setting of A0–03.	0	★
A0–03	Torque digital setting in torque control	–200.0%–200.0%	150.0%	☆
A0–05	Forward maximum frequency in torque control	0.00 Hz to maximum frequency	50.00 Hz	☆
A0–06	Reverse maximum frequency in torque control	0.00 Hz to maximum frequency	50.00 Hz	☆
A0–07	Acceleration time in torque control	0.00–65000s	0.00s	☆
A0–08	Deceleration time in torque control	0.00–65000s	0.00s	☆
Group A1: Virtual DI (VDI)/Virtual DO (VDO)				
A1–00	VDI1 function selection	0–59	0	★
A1–01	VDI2 function selection	0–59	0	★
A1–02	VDI3 function selection	0–59	0	★
A1–03	VDI4 function selection	0–59	0	★
A1–04	VDI5 function selection	0–59	0	★
A1–05	VDI state setting mode	0: Decided by state of VDOx 1: Decided by A1–06 Unit's digit (VDI1) Ten's digit (VDI2) Hundred's digit (VDI3) Thousand's digit (VDI4) Ten thousand's digit (VDI5)	00000	★

Function Code	Parameter Name	Setting Range	Default	Property
Group A1: Virtual DI (VDI)/Virtual DO (VDO)				
A1−06	VDI state selection	0: Invalid 1: Valid Unit's digit (VDI1) Ten's digit (VDI2) Hundred's digit (VDI3) Thousand's digit (VDI4) Ten thousand's digit (VDI5)	00000	★
A1−07	Function selection for AI1 used as DI	0–59	0	★
A1−08	Function selection for AI2 used as DI	0–59	0	★
A1−09	Function selection for AI3 used as DI	0–59	0	★
A1−10	State selection for AI used as DI	0: High level valid 1: Low level valid Unit's digit (AI1) Ten's digit (AI2) Hundred's digit (AI3)	000	★
A1−11	VDO1 function selection	0: Short with physical DIx internally 1–40: Refer to function selection of physical DO in group F5.	0	☆
A1−12	VDO2 function selection	0: Short with physical DIx internally 1–40: Refer to function selection of physical DO in group F5.	0	☆
A1−13	VDO3 function selection	0: Short with physical DIx internally 1–40: Refer to function selection of physical DO in group F5.	0	☆
A1−14	VDO4 function selection	0: Short with physical DIx internally 1–40: Refer to function selection of physical DO in group F5.	0	☆
A1−15	VDO5 function selection	0: Short with physical DIx internally 1–40: Refer to function selection of physical DO in group F5.	0	☆
A1−16	VDO1 output delay	0.0–3600.0s	0.0s	☆
A1−17	VDO2 output delay	0.0–3600.0s	0.0s	☆
A1−18	VDO3 output delay	0.0–3600.0s	0.0s	☆
A1−19	VDO4 output delay	0.0–3600.0s	0.0s	☆
A1−20	VDO5 output delay	0.0–3600.0s	0.0s	☆
A1−21	VDO state selection	0: Positive logic 1: Reverse logic Unit's digit (VDO1) Ten's digit (VDO2) Hundred's digit (VDO3) Thousand's digit (VDO4) Ten thousand's digit (VDO5)	00000	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group A2: Motor 2 Parameters				
A2–00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
A2–01	Rated motor power	0.1–1000.0 kW	Model dependent	★
A2–02	Rated motor voltage	1–2000 V	Model dependent	★
A2–03	Rated motor current	0.01–655.35 A (AC drive power ⩽ 55 kW) 0.1–6553.5 A (AC drive power > 55 kW)	Model dependent	★
A2–04	Rated motor frequency	0.01 Hz to maximum frequency	Model dependent	★
A2–05	Rated motor rotational speed	1–65535 RPM	Model dependent	★
A2–06	Stator resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ⩽ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A2–07	Rotor resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ⩽ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A2–08	Leakage inductive reactance (asynchronous motor)	0.01–655.35 mH (AC drive power ⩽ 55 kW) 0.001–65.535 mH (AC drive power > 55 kW)	Model dependent	★
A2–09	Mutual inductive reactance (asynchronous motor)	0.1–6553.5 mH (AC drive power ⩽ 55 kW) 0.01–655.35 mH (AC drive power > 55 kW)	Model dependent	★
A2–10	No-load current (asynchronous motor)	0.01 A to A2–03 (AC drive power ⩽ 55 kW) 0.1 A to A2–03 (AC drive power > 55 kW)	Model dependent	★
A2–27	Encoder pulses per revolution	1–65535	1024	★
A2–28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver 3: SIN/COS encoder 4: Wire–saving UVW encoder	0	★
A2–29	Speed feedback PG selection	0: Local PG 1: Extended PG 2: Pulse Input (DI5)	0	★
A2–30	A, B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★
A2–31	Encoder installation angle	0.0–359.9°	0.0°	★
A2–32	U, V, W phase sequence of UVW encoder	0: Forward 1: Reverse	0	★
A2–33	UVW encoder angle offset	0.0–359.9°	0.0°	★
A2–34	Number of pole pairs of resolver	1–65535	1	★

Function Code	Parameter Name	Setting Range	Default	Property
Group A2: Motor 2 Parameters				
A2–36	Encoder wire–break fault detection time	0.0s: No action 0.1–10.0s	0.0s	★
A2–37	Auto–tuning selection	0: No auto–tuning 1: Asynchronous motor static auto–tuning 2: Asynchronous motor complete auto–tuning	0	★
A2–38	Speed loop proportional gain 1	0–100	30	☆
A2–39	Speed loop integral time 1	0.01–10.00s	0.50s	☆
A2–40	Switchover frequency 1	0.00 to A2–43	5.00 Hz	☆
A2–41	Speed loop proportional gain 2	0–100	15	☆
A2–42	Speed loop integral time 2	0.01–10.00s	1.00s	☆
A2–43	Switchover frequency 2	A2–40 to maximum output frequency	10.00 Hz	☆
A2–44	Vector control slip gain	50%–200%	100%	☆
A2–45	Time constant of speed loop filter	0.000–0.100s	0.000s	☆
A2–46	Vector control over–excitation gain	0–200	64	☆
A2–47	Torque upper limit source in speed control mode	0: A2–48 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Via communication 6: MIN(AI1,AI2) 7: MIN(AI1,AI2)	0	☆
A2–48	Digital setting of torque upper limit in speed control mode	0.0%–200.0%	150.0%	☆
A2–51	Excitation adjustment proportional gain	0–20000	2000	☆
A2–52	Excitation adjustment integral gain	0–20000	1300	☆
A2–53	Torque adjustment proportional gain	0–20000	2000	☆
A2–54	Torque adjustment integral gain	0–20000	1300	☆
A2–55	Speed loop integral property	Unit's digit: Integral separated 0: Disabled 1: Enabled	0	☆
A2–61	Motor 2 control mode	0: Sensorless flux vector control (SFVC) 1: Closed–loop vector control (CLVC) 2: Voltage/Frequency (V/F) control	0	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group A2: Motor 2 Parameters				
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	0	☆
A2–63	Motor 2 torque boost	0.0%: Automatic torque boost 0.1%–30.0%	Model dependent	☆
A2–65	Motor 2 oscillation suppression gain	0–100	Model dependent	☆
Group A3: Motor 3 Parameters				
A3–00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
A3–01	Rated motor power	0.1–1000.0 kW	Model dependent	★
A3–02	Rated motor voltage	1–2000 V	Model dependent	★
A3–03	Rated motor current	0.01–655.35 A (AC drive power ⩽ 55 kW) 0.1–6553.5 A (AC drive power > 55 kW)	Model dependent	★
A3–04	Rated motor frequency	0.01 Hz to maximum frequency	Model dependent	★
A3–05	Rated motor rotational speed	1–65535 RPM	Model dependent	★
A3–06	Stator resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ⩽ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A3–07	Rotor resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power ⩽ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A3–08	Leakage inductive reactance (asynchronous motor)	0.01–655.35 mH (AC drive power ⩽ 55 kW) 0.001–65.535 mH (AC drive power > 55 kW)	Model dependent	★
A3–09	Mutual inductive reactance (asynchronous motor)	0.1–6553.5 mH (AC drive power ⩽ 55 kW) 0.01–655.35 mH (AC drive power > 55 kW)	Model dependent	★
A3–10	No–load current (asynchronous motor)	0.01 A to A3–03 (AC drive power ⩽ 55 kW) 0.1 A to A3–03 (AC drive power > 55 kW)	Model dependent	★
A3–27	Encoder pulses per revolution	1–65535	1024	★
A3–28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver 3: SIN/COS encoder 4: Wire–saving UVW encode	0	★
A3–29	Speed feedback PG selection	0: Local PG 1: Extended PG 2: Pulse Input (DI5)	0	★

Function Code	Parameter Name	Setting Range	Default	Property
Group A3: Motor 3 Parameters				
A3–30	A, B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★
A3–31	Encoder installation angle	0.0–359.9°	0.0°	★
A3–32	U, V, W phase sequence of UVW encoder	0: Forward 1: Reserve	0	★
A3–33	UVW encoder angle offset	0.0–359.9°	0.0°	★
A3–34	Number of pole pairs of resolver	1–65535	1	★
A3–36	Encoder wire–break fault detection time	0.0s: No action 0.1–10.0s	0.0s	★
A3–37	Auto–tuning selection	0: No auto–tuning 1: Asynchronous motor static auto–tuning 2: Asynchronous motor complete auto–tuning	0	★
A3–38	Speed loop proportional gain 1	0–100	30	☆
A3–39	Speed loop integral time 1	0.01–10.00s	0.50s	☆
A3–40	Switchover frequency 1	0.00 to A3–43	5.00 Hz	☆
A3–41	Speed loop proportional gain 2	0–100	15	☆
A3–42	Speed loop integral time 2	0.01–10.00s	1.00s	☆
A3–43	Switchover frequency 2	A3–40 to maximum output frequency	10.00 Hz	☆
A3–44	Vector control slip gain	50%–200%	100%	☆
A3–45	Time constant of speed loop filter	0.000–0.100s	0.000s	☆
A3–46	Vector control over–excitation gain	0–200	64	☆
A3–47	Torque upper limit source in speed control mode	0: A3–48 setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Via communication 6: MIN (AI1,AI2) 7: MAX (AI1,AI2)	0	☆
A3–48	Digital setting of torque upper limit in speed control mode	0.0%–200.0%	150.0%	☆
A3–51	Excitation adjustment proportional gain	0–20000	2000	☆
A3–52	Excitation adjustment integral gain	0–20000	1300	☆
A3–53	Torque adjustment proportional gain	0–20000	2000	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group A3: Motor 3 Parameters				
A3–54	Torque adjustment integral gain	0–20000	1300	☆
A3–55	Speed loop integral property	Unit's digit: Integral separated 0: Disabled 1: Enabled	0	☆
A3–61	Motor 3 control mode	0: Sensorless flux vector control (SVC) 1: Closed–loop vector control (FVC) 2: Voltage/Frequency (V/F) control	0	☆
A3–62	Motor 3 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	0	☆
A3–63	Motor 3 torque boost	0.0%: Automatic torque boost 0.1%–30.0%	Model dependent	☆
A3–65	Motor 3 oscillation suppression gain	0–100	Model dependent	☆
Group A4: Motor 4 Parameters				
A4–00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
A4–01	Rated motor power	0.1–1000.0 kW	Model dependent	★
A4–02	Rated motor voltage	1–2000 V	Model dependent	★
A4–03	Rated motor current	0.01–655.35 A (AC drive power $\leqslant$ 55 kW) 0.1–6553.5 A (AC drive power > 55 kW)	Model dependent	★
A4–04	Rated motor frequency	0.01 Hz to maximum frequency	Model dependent	★
A4–05	Rated motor rotational speed	1–65535 RPM	Model dependent	★
A4–06	Stator resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power $\leqslant$ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A4–07	Rotor resistance (asynchronous motor)	0.001–65.535 Ω (AC drive power $\leqslant$ 55 kW) 0.0001–6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A4–08	Leakage inductive reactance (asynchronous motor)	0.01–655.35 mH (AC drive power $\leqslant$ 55 kW) 0.001–65.535 mH (AC drive power > 55 kW)	Model dependent	★
A4–09	Mutual inductive reactance (asynchronous motor)	0.1–6553.5 mH (AC drive power $\leqslant$ 55 kW) 0.01–655.35 mH (AC drive power > 55 kW)	Model dependent	★
A4–10	No–load current (asynchronous motor)	0.01 A to F1–03 (AC drive power $\leqslant$ 55 kW) 0.1 A to F1–03 (AC drive power > 55 kW)	Model dependent	★
A4–27	Encoder pulses per revolution	1–65535	1024	★

Function Code	Parameter Name	Setting Range	Default	Property
Group A4: Motor 4 Parameters				
A4−28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver 3: SIN/COS encoder 4: Wire−saving UVW encoder	0	★
A4−29	Speed feedback PG selection	0: Local PG 1: Extended PG 2: Pulse Input (DI5)	0	★
A4−30	A, B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★
A4−31	Encoder installation angle	0.0−359.9°	0.0°	★
A4−32	U, V, W phase sequence of UVW encoder	0: Forward 1: Reverse	0	★
A4−33	UVW encoder angle offset	0.0−359.9°	0.0°	★
A4−34	Number of pole pairs of resolver	1−65535	1	★
A4−36	Encoder wire−break fault detection time	0.0s: No action 0.1−10.0s	0.0s	★
A4−37	Auto−tuning selection	0: No auto−tuning 1: Asynchronous motor static auto−tuning 2: Asynchronous motor complete auto−tuning	0	★
A4−38	Speed loop proportional gain 1	0−100	30	☆
A4−39	Speed loop integral time 1	0.01−10.00s	0.50s	☆
A4−40	Switchover frequency 1	0.00 to A4−43	5.00 Hz	☆
A4−41	Speed loop proportional gain 2	0−100	15	☆
A4−42	Speed loop integral time 2	0.01−10.00s	1.00s	☆
A4−43	Switchover frequency 2	A4−40 to maximum output frequency	10.00 Hz	☆
A4−44	Vector control slip gain	50%−200%	100%	☆
A4−45	Time constant of speed loop filter	0.000−0.100s	0.000s	☆
A4−46	Vector control over−excitation gain	0−200	64	☆
A4−47	Torque upper limit source in speed control mode	0: A4−48 setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Via communication 6: MIN(AI1,AI2) 7: MIN(AI1,AI2)	0	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group A4: Motor 4 Parameters				
A4–48	Digital setting of torque upper limit in speed control mode	0.0%–200.0%	150.0%	☆
A4–51	Excitation adjustment proportional gain	0–20000	2000	☆
A4–52	Excitation adjustment integral gain	0–20000	1300	☆
A4–53	Torque adjustment proportional gain	0–20000	2000	☆
A4–54	Torque adjustment integral gain	0–20000	1300	☆
A4–55	Speed loop integral property	Unit's digit: Integral separated 0: Disabled 1: Enabled	0	☆
A4–61	Motor 4 control mode	0: Sensorless flux vector control (SVC) 1: Closed–loop vector control (FVC) 2: Voltage/Frequency (V/F) control	0	☆
A4–62	Motor 4 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	0	☆
A4–63	Motor 4 torque boost	0.0%: Automatic torque boost 0.1%–30.0%	Model dependent	☆
A4–65	Motor 4 oscillation suppression gain	0–100	Model dependent	☆
Group A5: Control Optimization Parameters				
A5–00	DPWM switchover frequency upper limit	0.00–15.00 Hz	12.00 Hz	☆
A5–01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	☆
A5–02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	1	☆
A5–03	Random PWM depth	0: Random PWM invalid 1–10	0	☆
A5–04	Rapid current limit	0: Disabled 1: Enabled	1	☆
A5–05	Current detection compensation	0–100	5	☆
A5–06	Undervoltage threshold	60.0%–140.0%	100.0%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group A5: Control Optimization Parameters				
A5–07	SFVC optimization mode selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1	☆
A5–08	Dead–zone time adjustment	100%–200%	150%	☆
Group A6: AI Curve Setting				
A6–00	AI curve 4 minimum input	–10.00 V to A6–02	0.00 V	☆
A6–01	Corresponding setting of AI curve 4 minimum input	–100.0%–+100.0%	0.0%	☆
A6–02	AI curve 4 inflexion 1 input	A6–00 to A6–04	3.00 V	☆
A6–03	Corresponding setting of AI curve 4 inflexion 1 input	–100.0%– +100.0%	30.0%	☆
A6–04	AI curve 4 inflexion 1 input	A6–02 to A6–06	6.00 V	☆
A6–05	Corresponding setting of AI curve 4 inflexion 1 input	–100.0%–+100.0%	60.0%	☆
A6–06	AI curve 4 maximum input	A6–06 to +10.00 V	10.00 V	☆
A6–07	Corresponding setting of AI curve 4 maximum input	–100.0%–+100.0%	100.0%	☆
A6–08	AI curve 5 minimum input	–10.00 V to A6–10	0.00 V	☆
A6–09	Corresponding setting of AI curve 5 minimum input	–100.0%–+100.0%	0.0%	☆
A6–10	AI curve 5 inflexion 1 input	A6–08 to A6–12	3.00 V	☆
A6–11	Corresponding setting of AI curve 5 inflexion 1 input	–100.0%–+100.0%	100.0%	☆
A6–12	AI curve 5 inflexion 1 input	A6–10 to A6–14	6.00 V	☆
A6–13	Corresponding setting of AI curve 5 inflexion 1 input	–100.0%–+100.0%	60.0%	☆
A6–14	AI curve 5 maximum input	A6–14 to 10.00 V	10.00 V	☆
A6–15	Corresponding setting of AI curve 5 maximum input	–100.0%–+100.0%	100.0%	☆
A6–24	Jump point of AI1 input corresponding setting	–100.0%–+100.0%	0.0%	☆
A6–25	Jump amplitude of AI1 input corresponding setting	0.0%–100.0%	0.5%	☆
A6–26	Jump point of AI2 input corresponding setting	–100.0%–+100.0%	0.0%	☆
A6–27	Jump amplitude of AI2 input corresponding setting	0.0%–100.0%	0.5%	☆
A6–28	Jump point of AI3 input corresponding setting	–100.0%–100.0%	0.0%	☆
A6–29	Jump amplitude of AI3 input corresponding setting	0.0%–100.0%	0.5%	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group A8: Point–point Communication				
A8–00	Point–point communication selection	0: Disabled 1: Enabled	0	☆
A8–01	Master and slave selection	0: Master 1: Slave	0	☆
A8–02	Slave following master command selection	0: Slave not following running commands of the master 1: Slave following running commands of the master	0	☆
A8–03	Usage of data received by slave	0: Torque setting 1: Frequency setting	0	☆
A8–04	Zero offset of received data (torque)	−100.00%−+100.00%	0.00%	★
A8–05	Gain of received data (torque)	−10.00–10.00	1.0	★
A8–06	Point–point communication interruption detection time	0.0–10.0s	1.0s	☆
A8–07	Master data sending cycle	0.001–10.000s	0.001s	☆
Group AC: AI/AO Correction				
AC–00	AI1 measured voltage 1	0.500–4.000 V	Factory corrected	☆
AC–01	AI1 displayed voltage 1	0.500–4.000 V	Factory corrected	☆
AC–02	AI1 measured voltage 2	6.000–9.999 V	Factory corrected	☆
AC–03	AI1 displayed voltage 2	6.000–9.999 V	Factory corrected	☆
AC–04	AI2 measured voltage 1	0.500–4.000 V	Factory corrected	☆
AC–05	AI2 displayed voltage 1	0.500–4.000 V	Factory corrected	☆
AC–06	AI2 measured voltage 2	6.000–9.999 V	Factory corrected	☆
AC–07	AI2 displayed voltage 2	6.000–9.999 V	Factory corrected	☆
AC–08	AI3 measured voltage 1	−9.999–10.000 V	Factory corrected	☆
AC–09	AI3 displayed voltage 1	−9.999–10.000 V	Factory corrected	☆
AC–10	AI3 measured voltage 2	−9.999–10.000 V	Factory corrected	☆

Function Code	Parameter Name	Setting Range	Default	Property
Group AC: AI/AO Correction				
AC–11	AI3 displayed voltage 2	–9.999–10.000 V	Factory corrected	☆
AC–12	AO1 target voltage 1	0.500–4.000 V	Factory corrected	☆
AC–13	AO1 target voltage 1	0.500–4.000 V	Factory corrected	☆
AC–14	AO1 target voltage 2	6.000–9.999 V	Factory corrected	☆
AC–15	AO1 measured voltage 2	6.000–9.999 V	Factory corrected	☆
AC–16	AO2 target voltage 1	0.500–4.000 V	Factory corrected	☆
AC–17	AO2 measured voltage 1	0.500–4.000 V	Factory corrected	☆
AC–18	AO2 target voltage 2	6.000–9.999 V	Factory corrected	☆
AC–19	AO2 measured voltage 2	6.000–9.999 V	Factory corrected	☆
Group U0: Standard Monitoring Parameters				
U0–00	Running frequency (Hz)	0.01Hz	7000H	
U0–01	Set frequency (Hz)	0.01Hz	7001H	
U0–02	Busbar voltage	0.1V	7002H	
U0–03	Output voltage	1V	7003H	
U0–04	Output current	0.01A	7004H	
U0–05	Output power	0.1kW	7005H	
U0–06	Output torque	0.1%	7006H	
U0–07	DI state	1	7007H	
U0–08	DO state	1	7008H	
U0–09	AI1 voltage (V)	0.01V	7009H	
U0–10	AI2 voltage (V)/current (mA)	0.01V/0.01A	700AH	
U0–11	AI3 voltage (V)	0.01V	7007BH	
U0–12	Count value	1	700CH	
U0–13	Length value	1	700DH	
U0–14	Load speed	1	700EH	
U0–15	PID setting	1	700FH	
U0–16	PID feedback	1	7010H	
U0–17	PLC stage	1	7011H	
U0–18	Input pulse frequency (Hz)	0.01kHz	7012H	
U0–19	Feedback speed	0.1Hz	7013H	
U0–20	Remaining running time	0.1Min	7014H	

Function Code	Parameter Name	Min. Unit	Communication Address
Group U0: Standard Monitoring Parameters			
U0–21	AI1 voltage before correction	0.001V	7015H
U0–22	AI2 voltage (V) / current (mA) before correction	0.001V/0.01mA	7016H
U0–23	AI3 voltage before correction	0.001V	7017H
U0–24	Linear speed	1m/Min	7018H
U0–25	Accumulative power–on time	1Min	7019
U0–26	Accumulative running time	0.1Min	701AH
U0–27	Pulse input frequency	1Hz	701BH
U0–28	Communication setting value	0.01%	701CH
U0–29	Encoder feedback speed	0.01Hz	701DH
U0–30	Main frequency X	0.01Hz	701EH
U0–31	Auxiliary frequency Y	0.01Hz	701FH
U0–32	Viewing any register address value	1	7020H
U0–33	Synchronous motor rotor position	0.1°	7021H
U0–34	Motor temperature	1℃	7022H
U0–35	Target torque	0.1%	7023H
U0–36	Resolver position	1	7024H
U0–37	Power factor angle	0.1°	7025H
U0–38	ABZ position	1	7026H
U0–39	Target voltage upon V/F separation	1V	7027H
U0–40	Output voltage upon V/F separation	1V	7028H
U0–41	DI state visual display	1	7029H
U0–42	DO state visual display	1	702AH
U0–43	DI function state visual display 1	1	702BH
U0–44	DI function state visual display 2	1	702CH
U0–45	Fault information	1	702DH
U0–58	Phase Z counting	1	703AH
U0–59	Current set frequency	0.01%	703BH
U0–60	Current running frequency	0.01%	703CH
U0–61	AC drive running state	1	703DH
U0–62	Current fault code	1	703EH
U0–63	Sent value of point–point communication	0.01%	703FH
U0–64	Received value of point–point communication	0.01%	7040H
U0–65	Torque upper limit	0.1%	7041H

Chapter 5 Maintenance and Troubleshooting

5.1 Faults and Solutions

The IST200 provides a total of 24 pieces of fault information and protective functions. After a fault occurs, the AC drive implements the protection function, and displays the fault code on the operation panel (if the operation panel is available). Before contacting ISTECH for technical support, you can first determine the fault type, analyze the causes, and perform troubleshooting according to the following tables. If the fault cannot be rectified, contact the agent or ISTECH.

Err22 is the AC drive hardware overcurrent or overvoltage signal. In most situations, hardware overvoltage fault causes Err22.

Table 5−1 Solutions to the faults of the IST200

Fault Name	Display	Possible Causes	Solutions
Inverter unit protection	Err01	1: The output circuit is grounded or short circuited. 2: The connecting cable of the motor is too long. 3: The module overheats. 4: The internal connections become loose. 5: The main control board is faulty. 6: The drive board is faulty. 7: The inverter module is faulty.	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filter and the cooling fan. 4: Connect all cables properly. 5: Contact the agent or ISTECH. 6: Contact the agent or ISTECH. 7: Contact the agent or ISTECH.
Overcurrent during acceleration	Err02	1: The output circuit is grounded or short circuited. 2: Motor auto−tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto−tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.
Overcurrent during deceleration	Err03	1: The output circuit is grounded or short circuited. 2: Motor auto−tuning is not performed. 3: The deceleration time is too short. 4: The voltage is too low. 5: A sudden load is added during deceleration. 6: The braking unit and braking resistor are not installed.	1: Eliminate external faults. 2: Perform the motor auto−tuning. 3: Increase the deceleration time. 4: Adjust the voltage to normal range. 5: Remove the added load. 6: Install the braking unit and braking resistor.

Table 5−1 Solutions to the faults of the IST200

Fault Name	Display	Possible Causes	Solutions
Overcurrent at constant speed	Err04	1: The output circuit is grounded or short circuited. 2: Motor auto−tuning is not performed. 3: The voltage is too low. 4: A sudden load is added during operation. 5: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto−tuning. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Select an AC drive of higher power class.
Overvoltgae during acceleration	Err05	1: The input voltgae is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.
Overvoltgae during deceleration	Err06	1: The input voltgae is too high. 2: An external force drives the motor during deceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install a braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor.
Overvoltage at constant speed	Err07	1: The input voltage is too high. 2: An external force drives the motor during deceleration.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
Control power supply fault	Err08	The input voltage is not within the allowable range.	Adjust the input voltage to the allowable range.
Undervoltage	Err09	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The bus voltage is abnormal. 4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	1: Reset the fault. 2: Adjust the voltage to normal range. 3: Contact the agent or ISTECH 4. Contact the agent or ISTECH 5. Contact the agent or ISTECH 6. Contact the agent or ISTECH
AC drive overload	Err10	1: The load is too heavy or locked−rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.

Table 5−1 Solutions to the faults of the IST200

Fault Name	Display	Possible Causes	Solutions
Motor overload	Err11	1: F9−01 is set improperly. 2: The load is too heavy or locked−rotor occurs on the motor. 3: The AC drive model is of too small power class.	1: Set F9−01 correctly. 2: Reduce the load and check the motor and the mechanical condition. 3: Select an AC drive of higher power class.
Power input phase loss	Err12	1: The three−phase power input is abnormal. 2: The drive board is faulty. 3: The lightening board is faulty. 4: The main control board is faulty.	1: Eliminate external faults. 2: Contact the agent or ISTECH. 3: Contact the agent or ISTECH. 4: Contact the agent or ISTECH.
Power output phase loss	Err13	1: The cable connecting the AC drive and the motor is faulty. 2: The AC drive's three−phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor three−phase winding is normal. 3: Contact the agent or ISTECH. 4: Contact the agent or ISTECH.
Module overheat	Err14	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The inverter module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the inverter module.
External equipment fault	Err15	1: External fault signal is input via DI. 2: External fault signal is input via virtual I/O.	Reset the operation.
Communication fault	Err16	1: The host computer is in abnormal state. 2: The communication cable is faulty. 3: F0−28 is set improperly. 4: The communication parameters in group FD are set improperly.	1: Check the cabling of host computer. 2: Check the communication cabling. 3: Set F0−28 correctly. 4: Set the communication parameters properly.
Contactor fault	Err17	1: The drive board and power supply are faulty. 2: The contactor is faulty.	1: Replaace the faulty drive board or power supply board. 2: Replace the faulty contactor.

Table 5–1 Solutions to the faults of the IST200

Fault Name	Display	Possible Causes	Solutions
Current detection fault	Err18	1: The HALL device is faulty. 2: The drive board is faulty.	1: Replace the faulty HALL device. 2: Replace the faulty drive board.
Motor auto–tuning fault	Err19	1: The motor parameters are not set according to the nameplate. 2: The motor auto–tuning times out.	1: Set the motor parameters according to the nameplate properly. 2: Check the cable connecting the AC drive and the motor.
Encoder fault	Err20	1: The encoder type is incorrect. 2: The cable connection of the encoder is incorrect. 3: The encoder is damaged. 4: The PG card is faulty.	1: Set the encoder type correctly based on the actual situation. 2: Eliminate external faults. 3: Replace the damaged encoder. 4: Replace the faulty PG card.
EEPROM read–write fault	Err21	The EEPROM chip is damaged.	Replace the main control board.
AC drive hardware fault	Err22	1: Overvoltage exists. 2: Overcurrent exists.	1: Handle based on overvoltage. 2: Handle based on overcurrent.
Short circuit to ground	Err23	The motor is short circuited to the ground.	Replace the cable or motor.
Accumulative running time reached	Err26	The accumulative running time reaches the setting value.	Clear the record through the parameter initialization function.
User–defined fault 1	Err27	1: The user–defined fault 1 signal is input via DI. 2: User–defined fault 1 signal is input via virtual I/O.	Reset the operation.
User–defined fault 2	Err28	1: The user–defined fault 2 signal is input via DI. 2: User–defined fault 2 signal is input via virtual I/O.	Reset the operation.
Accumulative power–on time reached	Err29	The accumulative power–on time reaches the setting value.	Clear the record through the parameter initialization function.

Table 5–1 Solutions to the faults of the IST200

Fault Name	Display	Possible Causes	Solutions
Load becoming 0	Err30	The AC drive running current is lower than F9–64.	Check that the load is disconnected or the setting of F9–64 and F9–65 is correct.
PID feedback lost during running	Err31	The PID feedback is lower than the setting of FA–26.	Check the PID feedback signal or set FA–26 to a proper value.
Pulse–by–pulse current limit fault	Err40	1: The load is too heavy or locked–rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Motor switchover fault during running	Err41	Change the selection of the motor via terminal during running of the AC drive.	Perform motor seitchover after the AC drive stops.
Too large speed deviation	Err42	1: The encoder parameters are set incorrectly. 2: The motor auto–tuning is not performed. 3: F9–69 and F9–70 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor auto–tuning. 3: Set F9–69 and F9–70 correctly based on the actual situation.
Motor over–speed	Err43	1: The encoder parameters are set incorrectly. 2: The motor auto–tuning is not performed. 3: F9–69 and F9–70 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor auto–tuning. 3: Set F9–69 and F9–70 correctly based on the actual situation.
Motor overheat	Err45	1: The cabling of the temperature sensor becomes loose. 2: The motor temperature is too high.	1: Check the temperature sensor cabling and eliminate the cabling fault. 2: Lower the carrier frequency or adopt other heat radiation measures.
Initial position fault	Err51	The motor parameters are not set based on the actual situation.	Check that the motor parameters are set correctly and whether the setting of rated current is too small.

5.2 Common Faults and Solutions

You may come across the following faults during the use of the AC drive. Refer to the following table for simple fault analysis.

Table 5–2 Troubleshooting to common faults of the AC drive

SN	Fault	Possible Causes	Solutions
1	There is no display at power–on.	1: There is no power supply to the AC drive or the power input to the AC drive is too low. 2: The power supply of the switch on the drive board of the AC drive is faulty. 3: The rectifier bridge is damaged. 4: The control board or the operation panel is faulty. 5: The cable connecting the control board and the drive board and the operation panel breaks.	1: Check the power supply. 2: Check the bus voltage. 3: Re–connect the 8–core and 28–core cables. 4: Contact the agent or ISTECH for technical support.
2	"IST" is displayed at power–on.	1: The cable between the drive board and the control board is in poor contact. 2: Related components on the control board are damaged. 3: The motor or the motor cable is short circuited to the ground. 4: The HALL device is faulty. 5: The power input to the AC drive is too low.	1: Re–connect the 8–core and 28–core cables. 2: Contact the agent or ISTECH for technical support.
3	"Err23" is displayed at power–on.	1: The motor or the motor output cable is short–circuited to the ground. 2: The AC drive is damaged.	1: Measure the insulation of the motor and the output cable with a megger. 2: Contact the agent or ISTECH for technical support
4	The AC drive display is normal upon power–on. But "IST" is displayed after running and stops immediately.	1: The cooling fan is damaged or locked–rotor occurs. 2: The external control terminal cable is short circuited.	1: Replace the damaged fan. 2: Eliminate external fault.
5	Err14 (module overheat) fault is reported frequently.	1: The setting of carrier frequency is too high. 2: The cooling fan is damaged, or the air filter is blocked. 3: Components inside the AC drive are damaged (thermal coupler or others).	1: Reduce the carrier frequency (F0–15). 2: Replace the fan and clean the air filter. 3: Contact the agent or ISTECH for technical support.

Table 5–2 Troubleshooting to common faults of the AC drive

SN	Fault	Possible Causes	Solutions
6	The motor does not rotate after the AC drive runs.	1: Check the motor and the motor cables. 2: The AC drive parameters are set improperly (motor parameters). 3: The cable between the drive board and the control board is in poor contact. 4: The drive board is faulty.	1: Ensure the cable between the AC drive and the motor is normal. 2: Replace the motor or clear mechanical faults. 3: Check and re–set motor parameters.
7	The DI terminals are disabled.	1: The parameters are set incorrectly. 2: The external signal is incorrect. 3: The jumper bar across OP and +24 V becomes loose. 4: The control board is faulty.	1: Check and reset the parameters in group F4. 2: Re–connect the external signal cables. 3: Re–confirm the jumper bar across OP and +24 V. 4: Contact the agent or ISTECH for technical support.
8	The motor speed is always low in CLVC mode.	1: The encoder is faulty. 2: The encoder cable is connected incorrectly or in poor contact. 3: The PG card is faulty. 4: The drive board is faulty.	1: Replace the encoder and ensure the cabling is proper. 2: Replace the PG card. 3: Contact the agent or ISTECH for technical support.
9	The AC drive reports overcurrent and overvoltage frequently.	1: The motor parameters are set improperly. 2: The acceleration/deceleration time is improper. 3: The load fluctuates.	1: Re–set motor parameters or re–perform the motor auto–tuning. 2: Set proper acceleration/deceleration time. 3: Contact the agent or ISTECH for technical support.
10	Err17 is reported upon power–on or running.	The soft startup contactor is not picked up.	1: Check whether the contactor cable is loose. 2: Check whether the contactor is faulty. 3: Check whether 24 V power supply of the contactor is faulty. 4: Contact the agent or ISTECH for technical support.
11	$8.8.8.8.8.$ is displayed upon power–on.	Related component on the control board is damaged.	Replace the control board.

Warranty Agreement

1. The warranty period of the product is 18 months (refer to the barcode on the equipment). During the warranty period, if the product fails or is damaged under the condition of normal use by following the instructions, ISTECH will be responsible for free maintenance.

2. Within the warranty period, maintenance will be charged for the damages caused by the following reasons:

   a. Improper use or repair/modification without prior permission

   b. Fire, flood, abnormal voltage, other disasters and secondary disaster

   c. Hardware damage caused by dropping or transportation after procurement

   d. Improper operation

   e. Trouble out of the equipment (for example, external device)

3. If there is any failure or damage to the product, please correctly fill out the Product Warranty Card in detail.

4. The maintenance fee is charged according to the latest Maintenance Price List of ISTECH.

5. The Product Warranty Card is not re–issued. Please keep the card and present it to the maintenance personnel when asking for maintenance.

6. If there is any problem during the service, contact ISTECH's agent or ISTECH directly.

7. This agreement shall be interpreted by Shanghai ISTECH Electric Co., Ltd.

Product Warranty Card

Customer information	Add.:	
	Name:	Contact person:
	P.C.:	Tel.:
Product information	Product model:	
	Body barcode (Attach here):	
	Name of agent:	
Failure information	(Maintenance time and content): Maintenance personnel:	