User Manual

JMS15-SP Series Solar Inverter

Preface

Thank you for purchasing the JMS15-SP series solar inverter

Features:

- MPPT algorithm of fast tracking of maximum power point of PV cells, efficiency >99%.
- Solar battery working point voltage can be manually or automatically MPPT tracking.
- All weather automatic operation,can also be manually or automatically,
- Realize"sunrise work and sunset sleep".
- 35 kinds protection function. including auto detecting short circuit after power on.
- Auto sleep function/pump dry protect/low frequency protection/over load protection and etc.
- Full protections:overload,over current, overvoltage,under voltage,short circuit, dry pumping etc.
- Output frequency range: V/F(0~3000hz); vector control(0~300HZ).
- Overload capacity:60s with 150% of rated current,3s with 180% of rated current.
- Speed accuracy:±0.5%(SVC);±0.02%(VC).
- Pulse setting input:0Khz~100Khz.
- Remote control, support RS232/RS485 protocol, terminal control, analog control.

Before unpacking, please check carefully:

1. Whether the nameplate model of solar inverter are consistent with your order ratings. The box contains the solar inverter, user manual.
2. Whether the solar inverter is damaged during transportation. If you find any omission or damage, please contact us or your local 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 to ensure correct use.

Due to the continuous improvement of solar inverter, this document will be updated without prior notice.

JMS15-SP series solar inverter complies with the following international standards. All products have passed the CE certification.

IEC/EN61800-5-1: 2003 Variable speed electric drive system safety requirements;

IEC/EN61800-3: 2004 Variable speed electric drive system, Part 3: The Electro Magnetic Compatibility (EMC) Standards of Product and its specific testing methods.

Contents

1. Safety Information and Precautions

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. JMS will assume no liability or responsibility for any injury or loss caused by improper operation.

1.1 Safety Information

⚡ **Danger**

- Do not use damaged or missing components solar inverter. Failure to comply will result in personal injury.
- Please use the electric motor with upper B insulation class. Failure to comply will result in personal injury.
- Install the solar inverter on incombustible objects such as metal, and keep it away from combustible materials. Failure to comply may result in a fire.
- 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 solar inverter. 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.
- Connect the solar inverter to ground properly by standard. Failure to comply may result in electric shock.
- Cover the solar inverter properly before power-on to prevent electric shock.
- Do not open the solar inverter's cover after power-on to prevent from electric shock.
- Do not touch the solar inverter with wet hand and its peripheral circuit to prevent from electric shock.
- Do not touch the terminals of the solar inverter (including the control terminals). Failure to comply may result in electric shock.
- Do not touch the U, V, W terminal or motor connecting terminals when solar inverter automatically does safety testing for the external high-voltage electrical circuit. Failure to comply may result in electric shock.
- Do not go close to the equipment when selected the restart function. Failure to comply may result in personal injury.
- Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal injury.
- Signal detection must be performed only by qualified personal during operation

⚠️**Warning:**

- When two solar inverters are laid in the same cabinet, arrange the installation positions properly to ensure the enough cooling effect.
- Do not drop wire residue or screw into the solar inverter. Failure to comply will result in damage to the solar inverter.
- Never connect the power supply cables to the output terminals (U, V, W) of the solar inverter. Failure to comply will result in damage to the solar inverter.
- Make sure that all the connecting wires comply with the requirement of EMC and the safety standard in the region. Use wire sizes recommended in the manual. Failure to comply may result in accidents.
- Never connect the braking resistor between the DC bus terminals (P+) and (P-). Failure to comply may result in a fire.
- Do not perform the voltage resistance test on any part of the solar inverter because such test has been done in the factory. Failure to comply will result in accidents.
- All peripheral devices must be connected properly under the instructions described in this manual. Failure to comply will result in accidents.
- Note the danger during the rotary running of motor when check the parameters. Failure to comply will result in accidents.
- Do not change the factory default settings of the solar inverter. Failure to comply will result in damage to the solar inverter.
- Avoid objects falling into the solar inverter when it is running. Failure to comply will result in damage to solar inverter.
- Do not start/stop the solar inverter by turning the contactor ON/OFF. Failure to comply will result in damage to the solar inverter.

2. Product Information

2.1 Designation Rules

JMS15 - SP 3 - 7d5
❶   ❷ ❸   ❹

❶	JMS15 Series Frequency Inverter
❷	Products Type: PV use
❸	Voltage range: 1: DC 250~400V to Three phase AC 220V 3: DC 350~750V to Three phase AC 380V
❹	Adaptable motor: 7d5: 7.5KW ;011: 11KW

Diagram 2-1 Designation rules

2.2 Model and Technical Data

Table 2-1JMS15-SP Model and technical data

JMS15-SP1 Description	d75	1d5	2d2	004	5d5	7d5	011	015	018	022	030	037	045
DC input (+, -)													
Rated power/KW	0.75	1.5	2.2	4	5.5	7.5	11	15	18.5	22	30	37	45
Min. DC voltage/V	120												
Max.DC voltage/V	400												
Recommended MPPT range /V	250~400												
AC output(U, V, W)													
Output current/A	3.8	5.1	9	13	25	32	45	60	75	91	112	150	176

JMS15-SP3 Description	d75 055	1d5 075	2d2 090	004 110	5d5 132	7d5 160	011 200	015 220	018 250	022 280	030 315	037 355	045 400
DC input (+, -)													
Rated power/KW	0.75	1.5	2.2	4	5.5	7.5	11	15	18.5	22	30	37	45
	55	75	90	110	132	160	200	220	250	280	315	355	400
Min. DC voltage/V	280												
Max.DC voltage/V	750												
Recommended MPPT range /V	350~750												
AC output(U, V, W)													
Output current	2.1	3.8	5.1	9	13	17	25	32	37	45	60	75	91
	112	150	176	210	253	304	377	426	465	520	585	650	725

Output frequency	0~50/60Hz
Power factor	>0.99
Communication mode	RS485 communication
Protection class	IP20
Ambient temperature	-10℃~ +40℃(ambient temperation at 40℃~50℃，please keep derated use)
Storage temperature	-20℃~ +60℃
Humidity	Smaller than 95%RH, non-condensation
Cooling	Forced Air cooling
Altitude	Lower than 1000 m
Humidity	Less than 95%RH, without condensing
Vibration	Less than 5.9 m/s2 (0.6 g)

2.3 Product Appearance and Installation Dimension

2.3.1 Product Appearance
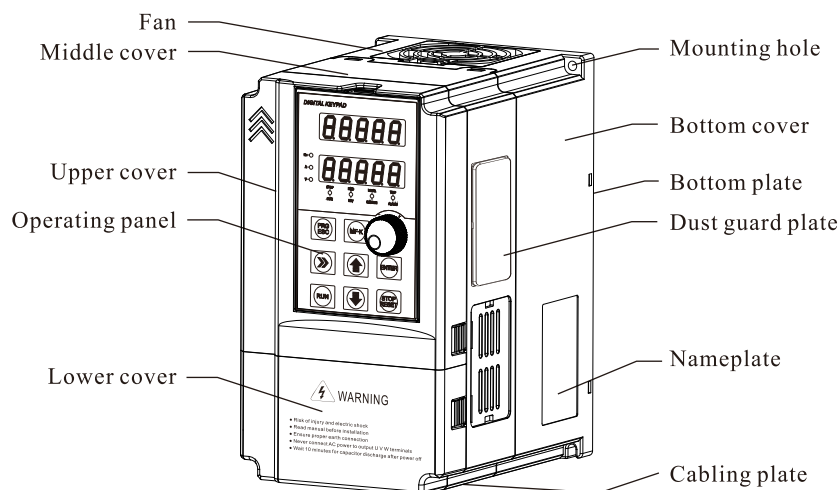
Diagram 2-2   Product appearance (With potentiometer)

2.3.2 Appearance and Installing Dimension
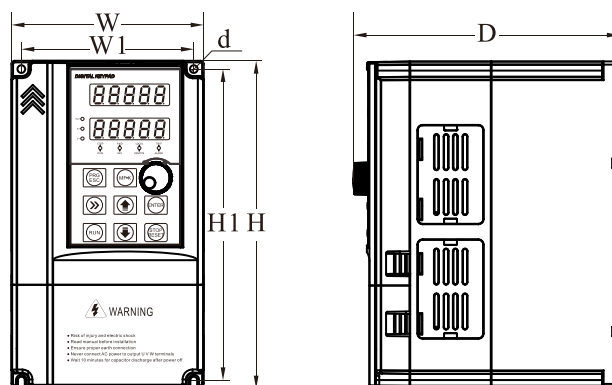
Diagram 2-3   Appearance and installation dimension of JMS15 series (Plastic housing structure)

Matching inverter		Appearance and installing dimension (Unit: mm)					
Voltege	**Power Range**	**W**	**W1**	**H**	**H1**	**D**	**d**
1PH 220V	0.75~2.2kW	120	108	205	195	166	Φ4.5
3PH 220V	0.75~2.2kW						
3PH 380V	4~5.5kW						
3PH 220V	4~5.5kW	162	148	250	238	191	Φ5.5
3PH 380V	7.5~11kW						
3PH 220V	7.5~11kW	223	207	323	307	207	Φ5.5
3PH 380V	15~22kW						
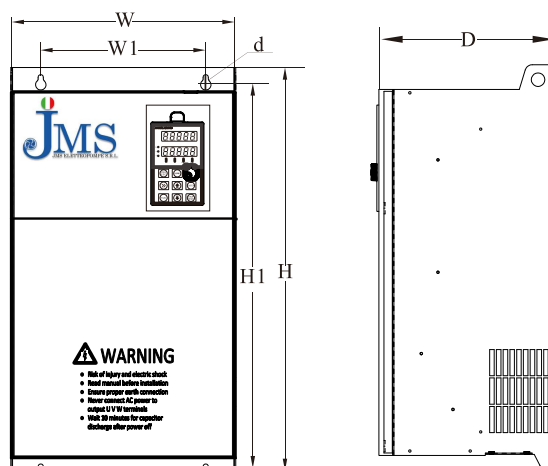
Diagram 2-4   Appearance and installation dimension of JMS15 series (Metal housing structure)

Matching inverter		Appearance and installing dimension (Unit: mm)					
Voltege	**Power Range**	**W**	**W1**	**H**	**H1**	**D**	**d**
3PH 220V	15~18.5kW	300	220	540	500	240	Φ7
3PH 380V	30~37kW						
3PH 220V	22kW	340	260	580	540	270	Φ10
3PH 380V	45~55kW						
3PH 220V	37~45KW	410	260	610	575	280	Φ12
3PH 380V	75~90kW						
3PH 380V	110~132kW	460	320	710	690	335	Φ12
3PH 380V	160~220kW	535	360	885	830	370	Φ12
3PH 380V	250~315kW	650	360	1040	985	415	Φ12
3PH 380V	355~400kW	815	600	1350	1250	445	Φ12

2.3.3 Installation Dimension of External Keypad (Keypad Tray)
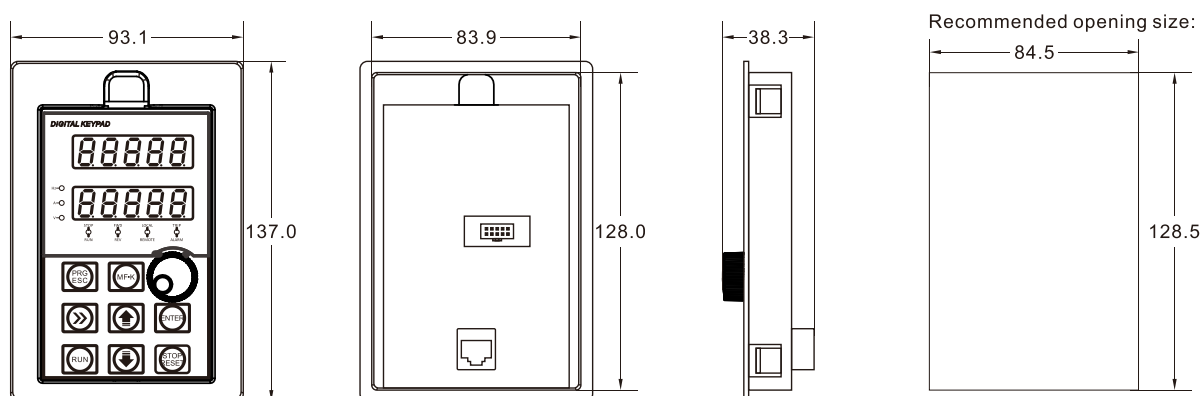
Diagram 2-5   Appearance and installation dimension of external keypad (keypad tray)

3.Installation of Frequency Inverter

3.1 Installation Environment

1. The place with indoor vents or ventilation devices.
2. The environment temperature shall be -10℃~40℃. If the temperature is over 40℃but less than 50℃, better to take down the cover of frequency inverter or open the front door of cabinet to facilitate heat dissipation.
3. Try to avoid high temperature and wet place; the humidity shall be less than 90% without frost deposit.
4. Avoid direct sunlight.
5. Keep away from flammable, explosive and corrosive gas and liquid.
6. No dust, floating fiber and metal particles.
7. Install on the place without strongly vibration. And the vibration should be not over 0.6G, Especially pay attention to far away from the punching machine, etc.
8. Keep away from electromagnetic interference source.

3.2 Installation Direction and Space

In order to not affect the service life of frequency inverter and reduce its performance, note for its installation direction and space and correctly fasten it.
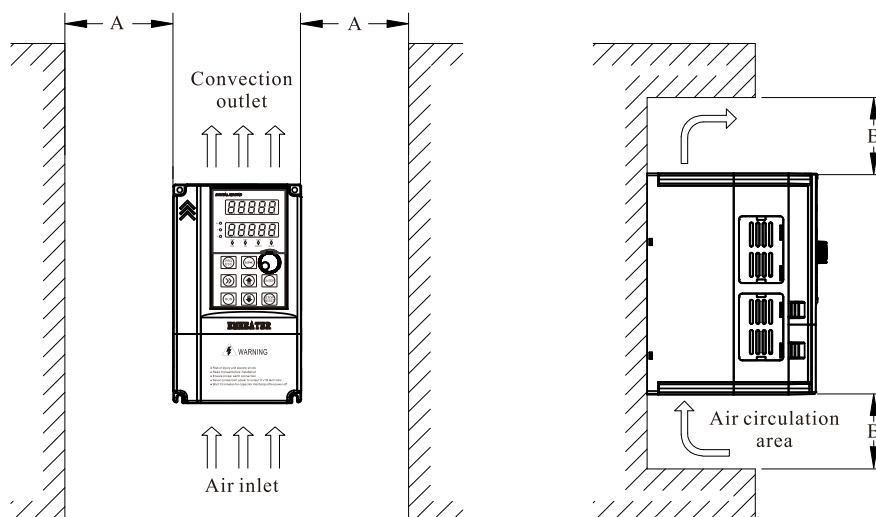
Diagram3-1   Ventilating duct installation dimension diagram of frequency inverter

Power class	Installation dimension	
	A	**B**
≤7.5kW	≥ 20mm	≥ 100mm
11kW - 30kW	≥ 50mm	≥ 200mm
≥ 37kW	≥ 50mm	≥ 300mm

Please install the frequency inverter vertically, to send out the heat upward, and pay attention to direction of frequency inverter to avoid inversion.

If there are several units of frequency inverter installed, please install them side by side, do not to install up and down.

3.3 Sketch and Description of Main Circuit Terminals

3.3.1 Function and Description of Main Circuit Terminals

Three phase 220V output：JMS15-SP1-d75~JMS15-SP1-011

Three phase 380V output：JMS15-SP3-d75～JMS15-SP3-022
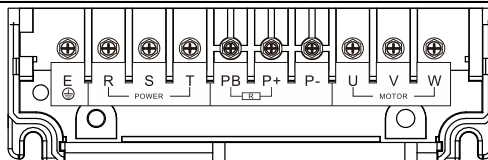
Three phase 380V output：JMS15-SP3-030～JMS15-SP3-090
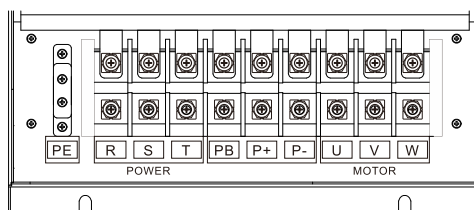
Three phase 380V output：JMS15-SP3-110～JMS15-SP3-400
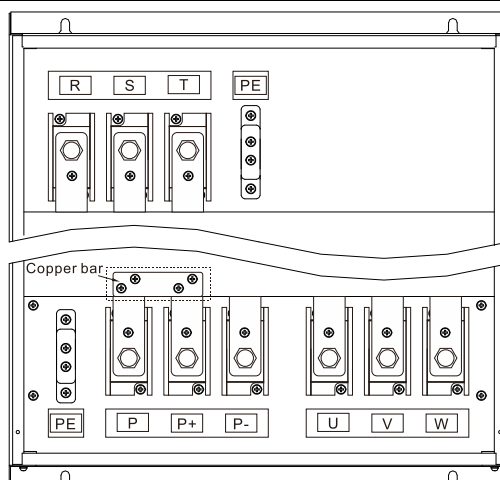
Terminal symbol	Function description
R, S, T	AC power input terminals
P+,PB	Braking resistor connectin
P+,P-	DC power input terminals
⏚ or E/PE	Grounding terminal
U,V,W	Three-phase AC power output terminals

3.4 Control Circuit and Main Circuit Terminals Description

3.4.1 Control Circuit and Main Circuit Wiring
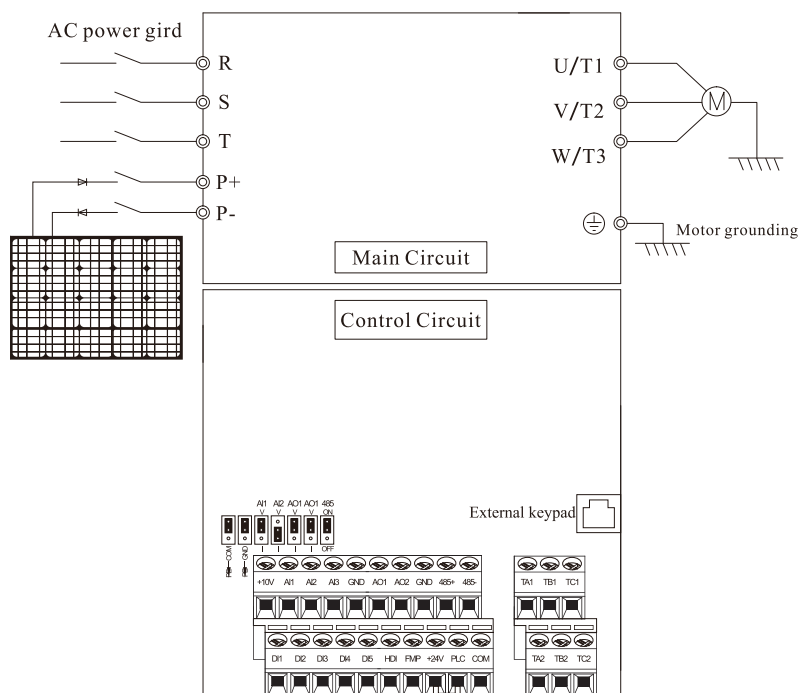
Diagram3-2   JMS15-SP control circuit and main circuit wiring

3.4.2 Control Circuit Terminal Layout
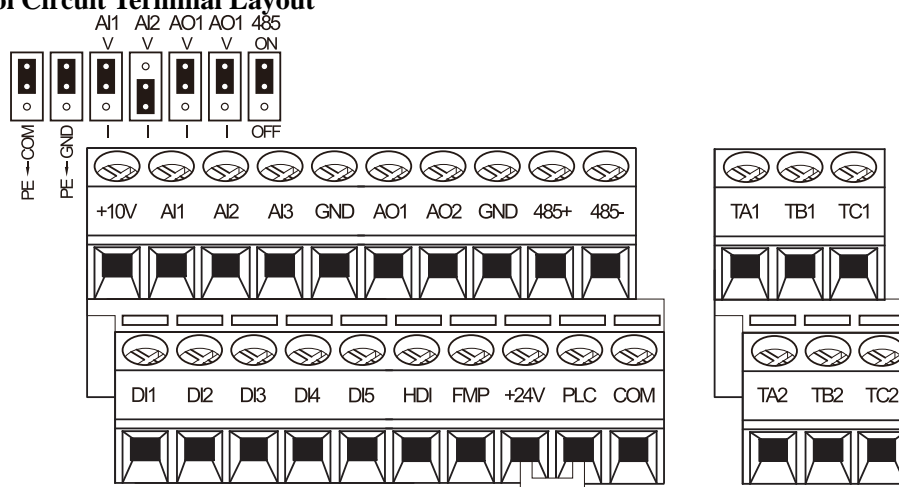
Diagram3-3   JMS15-SP control circuit terminal sketch diagram

3.4.3 Description of Control Circuit Terminals

Type	Terminal Symbol	Terminal Name	Terminal function description
Power Supply	+10V-GND	External +10V power supply	Provide +10V power supply to external unit. Maximum output current:10Ma Generally, it provides power supply to external potentiometer with resistance range of 1 kΩ~5kΩ
	+24V-COM	External +24V power supply	Provide +24 V power supply to external unit. Generally, it provides power supply to DI/DO terminals and external sensors.Maximum output current: 200 mA

Type	Terminal Symbol	Terminal Name	Terminal function description
	PLC	External power supply input terminals	It connect with +24V default
Analog input	AI1-GND	Analog input 1	1. Input range: DC 0V~10V/ 0mA~20mA(decided by jumper AI1/AI2 on the control board); AI3: DC -10V~+10V 2. Impedance: 22 kΩ (voltage input), 500 Ω (current input)
	AI2-GND	Analog input 2	
	AI3-GND	Analog input 3	
Digital input	DI1-COM	Digital input 1	1. Optical coupling isolation, compatible with dual polarity input 2.Input Impedance: 2.4 kΩ 3. Voltage range for level input: 9V~30 V
	DI2-COM	Digital input 2	
	DI3-COM	Digital input 3	
	DI4-COM	Digital input 4	
	DI5-COM	Digital input 5	
	HDI-COM	High Speed Pulse Input	Maximum input frequency: 100 kHz
Analog output	AO1-GND	Analog output 1	Voltage or current output is decided by jumper AO1/AO2. Output voltage range: 0V~10 V Output current range: 0mA~20 mA
	AO2-GND	Analog output 2	
	FMP- COM	High Speed Pulse Output	Constrained by function code b4-00 "FMP terminal output mode selection" as the high-speed pulse output, the highest frequency is 100kHz; when use as an open collector output, specifications is the same as DO.
Relay output	TA1-TB1	NC terminal	Contact driving capacity: 250 VAC, 3 A, COSø = 0.4 DC 30 V, 1 A
	TA2-TB2		
	TA1-TC1	NO terminal	
	TA2-TC2		
RS485 Output	485+	Communication port terminal	Input and output signal terminals for MODBUS protocol communication
	485-		
Auxiliary interface	PG card interface		PG cards: Open-collector, differential are selectable options.
	Communications expansion		Reversed
	External keypad interface		Connected to an external keypad
Jumper	PE-COM		COM grounding PE selection ,default connection. In the case of interference, connecting PE to COM can improve anti-interference
	PE-GND		GND grounding PE selection ,default connection. In the case of interference, connecting PE to COM can improve anti-interference.
	AI1		AI1 output selection. Voltage or Current output, voltage output by default.
	AI2		AI2 output selection. Voltage or Current output, current output by default.
	AO1/AO2		AO1/AO2 output selection. Voltage or Current output, voltage output by default.
	458		485 communication resistor selection, default connection ON. In the case of interference, anti-interference can be improved.

3.5 Collection Diagram For Different Motor
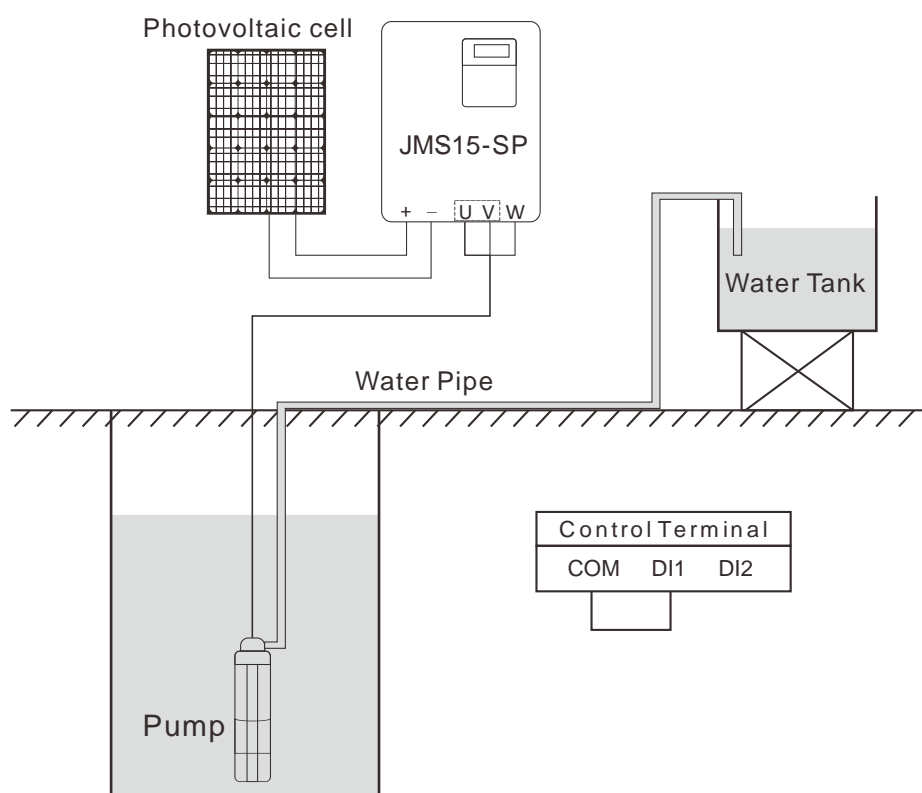
Diagram3-4   220V three phase installed without water level sensor (PV Input)
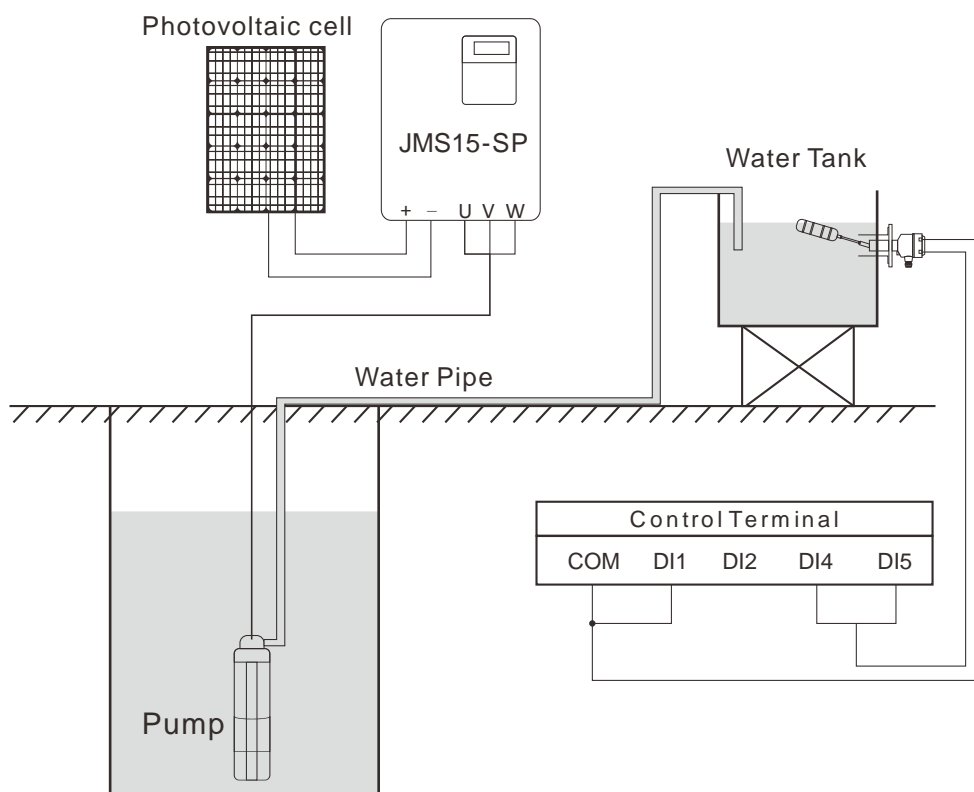
Diagram3-5   Diagram of 3phsae inverter connection method (PV Input)

3.5.1 The Wiring of Water-Level Automatic Control

The wiring for floater water-level switch connected by cable

The common port, which using floate water-level switch connected by cable, is fed to the terminal "COM" of JMS15-SP. And then, connected to DI1.
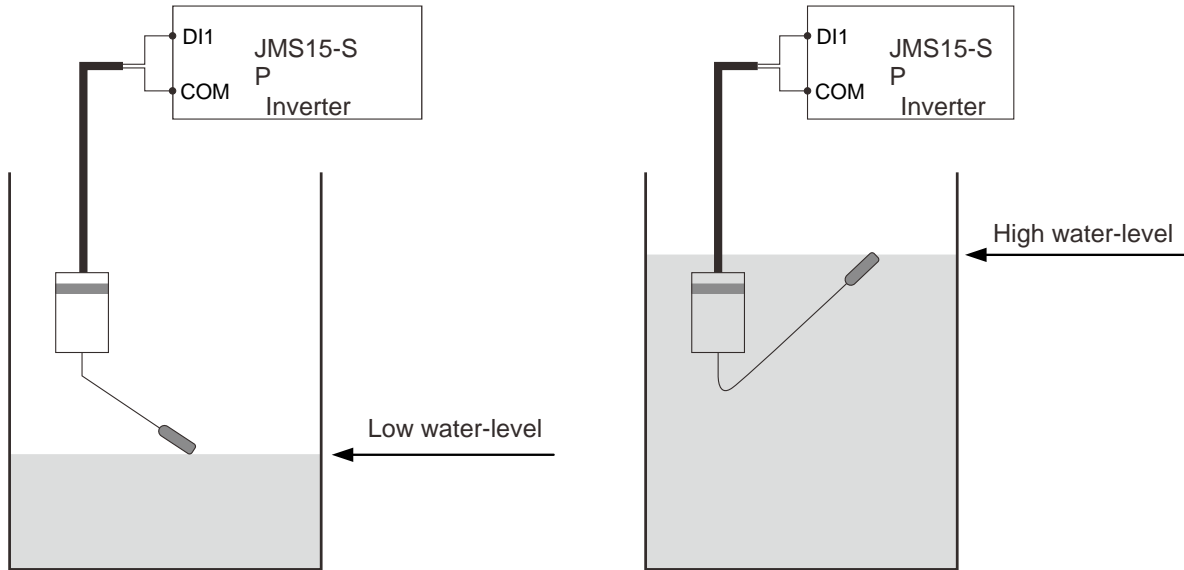
Diagram3-6 Diagram of Low water level and high water level

Remarks:

When the actual water-level in the wells is higher than the horizontal line of high water-level,   DI1 will be connected to the "COM" as well as controller automatically will start the pump. On the contrary, if the actual water-level is lower than the horizontal line of low water-level,   DI1 will be disconnected from "COM" as well as controller automatically stop the pump to prevent anhydrous idling.

The wiring for floater water-level switch mounted on a side

The floater water-level switch mounted on a side is the normally open contact to output and its common wire is connected to the terminal COM of JMS15-SP inverter. At the same time, the low level-water wire is connected to terminal DI4 and the high water-level wire is connected the terminal DI5.
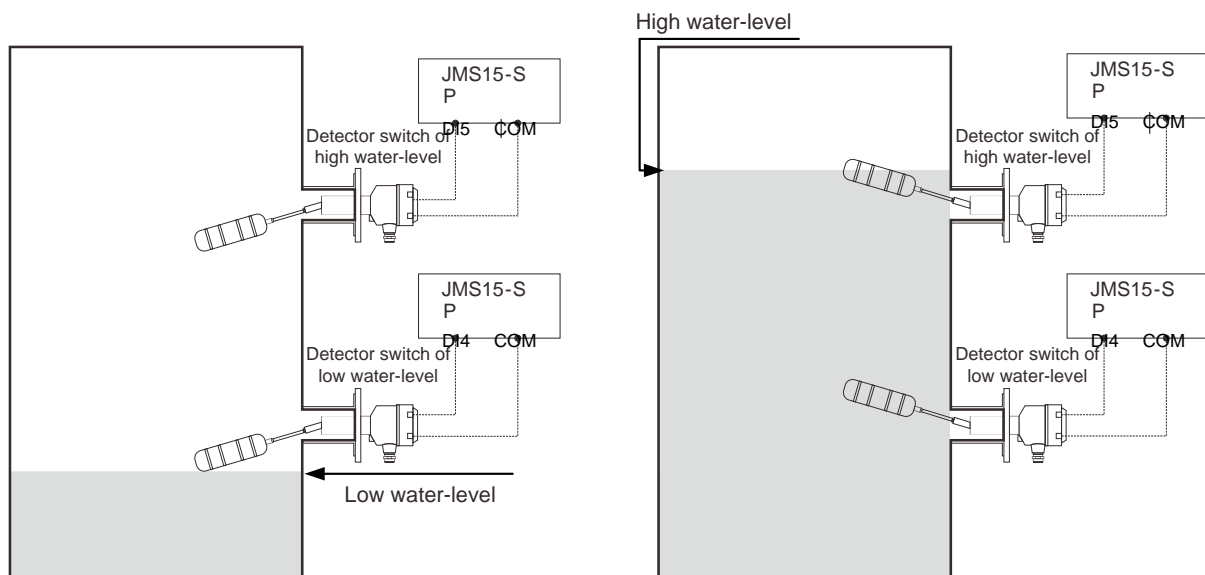
Diagram3-7   Diagram of Low water level and high water level

Remarks:

When the actual water-level in the reservoir is lower than horizontal line of low water-level, DI4 and DI5 will be disconnected from the COM as well as controller automatically strat the pum. On the contrary, if the actual water-level is higher than the horizontal line of high water-level, DI4 and DI5 will be connected to COM as well as controller automatically stop the pump to prevent water overflow.

Notice:

1. If only use one detection signal of water-level in the reservoir, DI4 and DI5 must be connected together by conductor.

4 Operation and Display

4.1 Instruction of Operation and Display
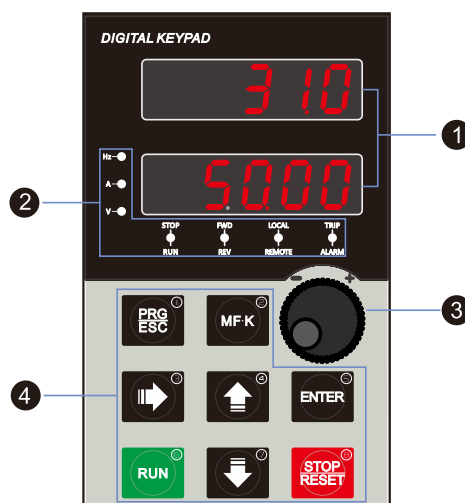
Diagram 4-1   Operating panel

No.	Name		Function
❶	LED display area		The 5-digit LED display is able to display the set frequency, output frequency, monitoring data and fault codes.
❷	Unit / Status Indicator area	Hz	Frequency unit
		A	Current unit
		V	Voltage unit
		STOP/ RUN	OFF indicates that the frequency inverter is in the stop state and ON indicates that the frequency inverter is in the running state.
		FWD/REV	It is Forward/Reversal indicator, ON indicates Reverse rotation.
		LOCAL /REMOTE	It indicates whether the frequency inverter is operated by operation keypad, terminals or remoter (communication). OFF indicates keypad operation control state; ON indicates terminals operation control state; Blinking indicates remote operation control state.
		TRIP /ALARM	Tunning/ Torque Control/Fault indicator 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.
❸	Encoder knob		Frequency, data or function code increase or decrease; the encoder knob has the confirmation key function
❹	Operation key area	PRG ESC	Programming key: Enter or exit menu level I.
		ENTER	Confirmation key: Enter the menu interfaces level by level, and confirm the parameter setting.
		MF·K	Multi-function key: Perform function switchover according to the setting of b9-01
		≫	Shift key: Select the displayed parameters in turn in the stop or running state, and select the digit to be modified when modifying parameters.
		⬆	Increment key: Increase data or function code.
		⬇	Decrement key: Decrease data or function code.
		RUN	Running key: Start the frequency inverter in the keypad control mode.
		STOP RESET	Stop/Reset key: Stop the frequency inverter 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 by b9-00.

4.2 Function Code Table

Debugging specification:

1. Set A1-00 to turn on photovoltaic mode, or it'll run in ordinary inverter mode; Set A1-01 to enable MPPT function to search Vmpp voltage automatically; Otherwise, the default Vmpp voltage needs to be set manually;

2. Target frequency is the maximum frequency limit, and MPPT automatically controls the operating frequency and searches for the maximum operating frequency;

3. Stability parameters A1-13, A1-14: Adjust to the stable state of bus voltage, output frequency and output current (normal small fluctuation);

4. Light intensity detection:

5. Other protection functions: dormancy and underload

6. The operation direction of the pump is limited. If there is no water coming out, the motor wiring can be adjusted or b0.18 can be set to change the direction;

7. Relevant Settings of A1-04, sleeping voltage, etc. should be made according to the configuration of the panel. Default parameters are suitable for working near 500V DC voltage;

8. Power on automatic operation:

Group A1: PV Special Control Parameters

Code	Parameter Name	Functional description	Default	Property
A1-00	PV mode enable	0: Disabled 1: Enabled	1	★
		A1-00=0 means solar control mode unvalid, A1 group parameters unable. A1-00=1 means solar control mode, A1 group parameters enable.		
A1-01	Vmpp voltage Selection	0: Manual setting 1: MPPT Automatic algorithm tracking	1	★
		A1-01=0 means manual reference, reference voltage should be given by A1-02, it is a fixed value. A1-01=1 means the maximum power is used to track a given reference voltage, and the reference voltage will continue to change until the system is stable.		
A1-02	Vmpp voltage value of manual given	0~100.0%	85.00%	★
		A1-01=0 manual given mode, the recorded value of A1-15 is calculated according to the percentage of A1-02 (A1-15*A1-02).		
A1-03	PV open circuit voltage selection	0: Automatic detection of shutdown 1: Manual setting	0	★
		A1-03=0 Automatically detect the voltage，the voltage will continue to change accoding the real input voltage. A1-03=1,manual setting, reference voltage should be given by A1-04, it is a fixed value.		
A1-04	PV open circuit voltage manual setting value	0.0~1000.0V	500.0V	★
		when A1-03=1, the reference voltage value is given by A1-04, and the value will be displayed by A1-15 in real time.		
A1-05	MPPT interval	0.1~100.0s	1.0s	★
		The MPPT search interval time indicates the MPPT tracking speed. The smaller value, the faster MPPT tracking. too small MPPT search interval time may cause large frequency fluctuations.		
A1-06	MPPT hysteresis	0.01Hz~5.00Hz	0.10Hz	★
A1-07	MPPT step size	0.01%~10.00%	0.10%	★
		It calculates the disturbance step length according to the different points' slopes on the PV array PU curve, and use the hysteresis comparison method to determine the disturbance direction, so the system can quickly and accurately track to the maximum power point without oscillation. This algorithm can significantly improve the tracking speed and accuracy. When the external environment has a sudden change, it can track to the maximum power point quickly still, and can effectively avoid the misjudgment problem in the tracking process, and improve the energy utilization rate of the photovoltaic power generation system. The larger value of A1-07, the slower the response, the smaller the faster response.		
A1-08	MPPT voltage upper limit	0.0~100.0%	100.0%	★
		It is for setting reference voltage upper limit ratio, and perform the according to the open-circuit voltage A1-15		

Code	Parameter Name	Functional description	Default	Property
		for ratio calculation. Note: When A1-15 exceeds 85%, the result will be calculated at the ratio of 85%.		
A1-09	MPPT voltage lower limit	0.0~100.0%	60.0%	★
		It is for setting reference voltage lower limit ratio,		
A1-10	CVT proportional gain 1	0.00~20.00	0.50	★
		The larger value, the greater effect and the faster adjustment.		
A1-11	CVT integral coefficient 1	0.00~20.00	0.50	★
		The larger value, the greater effect and the faster adjustment.		
A1-12	CVT proportional gain 2	0.00~20.00	1.00	★
		The larger value, the greater effect and the faster adjustment.		
A1-13	CVT integral coefficient 2	0.00~20.00	1.00	★
		The larger value, the greater effect and the faster adjustment.		
A1-14	CVT switching point	3.0%~15.0%	5.0	★
		When the absolute value of the difference value between the PV voltage and the reference voltage is larger than A1-14 setting value, switch to A1-12 and A1-13; otherwise, use A1-10 proportional coefficient 1 and A1-11 integral coefficient 1. Note: A1-14 is proportional to caculate by the given value of A1-15.		
A1-15	Open circuit reference voltage display	0.0~6553.5V	0.0V	●
		Display the currently open circuit reference voltage		
A1-16	PV DC current given display	0.00~655.35A	0.00A	●
		Display PV DC current		
A1-17	PV DC current gain	0.0~200.0%	100.0%	★
A1-18	PV DC current bias	-100.00~100.00A	0.00A	★
		If the PV DC current display A1-16 is not accurate, the current can be calibrated through A1-17 and A1-18.		
A1-19	Sleep voltage	0.0~1000.0V	360.0V	★
		Use this voltage to decide low-voltage sleep judgement . When inverter is running, if the bus voltage is lower than sleep voltage A1-19, inverter enters the dormant state and stops automatically		
A1-20	Wake-up voltage	0.0~1000.0V	400.0V	★
A1-21	Wake-up delay	0~30000s	60s	★
		When the inverter is under low-voltage sleep protection (A-LP) and the currently running command is valid, then when the bus voltage is larger than the wake-up voltage A1-20, after the wake-up delay A1-21, the low-voltage sleep alarm will be automatically cleared and the inverter starts start up.		
A1-22	Light weak detection frequency	0.00~100.00Hz	15.00Hz	★
		Use this frequency to judgement the weak light condition.		
A1-23	Low light sleep delay	0~30000s	30s	★
		light-weak sleep delay setting: During the operation of the inverter, when the output frequency is lower than the light-weak detection frequency A1-22, after the light-weak sleep delay A1-23, it will report the light-weak dormancy alarm (A-LS) and stop automatically. When the bus voltage is lower than the sleep voltage A1-19, it will directly report the light-weak dormancy alarm without delay. Note: During the delay process, if can not fullfill with the light-weak sleep delay judgment condition, the timer will be automatically cleared.		
A1-24	Light weak wake-up delay	0~30000s	60s	★
		Light weak wake-up time setting: When the inverter is under light-weak dormancy alarm (A-LS) and the currently running command is valid, when the inverter's operating frequency is larger than the light-weak detection frequency A1-22, after the light weak wake-up delay A1-24, the alarm A-LS will be automatically cleared, and inverter starts to start. Note: During the delay process, if can not fullfill with the light-weak sleep delay judgment condition, the timer will be automatically cleared.		
A1-25	Underload detection current	0.00~300.00A	0.00A	★
		Underload detection current setting is used for judgement the current underload's condition		

Code	Parameter Name	Functional description	Default	Property
A1-26	Underload detection time	0~30000s	60s	★
	During the operation of the inverter, if the currently running current continues to be less than the underload detection current A1-25, after the underload detection time A1-26 , an underload protection alarm (A-LL1) will be reported and the inverter automatically stop. Note: During the detection process, if if can not fullfill with the underload running detection time judgment condition, the timer will be automatically cleared.			
A1-27	Underload reset delay	0~30000s	300s	★
	When the inverter is under the underload protection warning (A-LL1), and the currently running command is valid, after underload reset delay A1-27, the underload protection alarm will be automatically cleared and the inverter starts to start. Note: During the delay process, if the underload running detection time judgment is not met, the timer will be automatically cleared.			
A1-28	Full water delay	0~30000s	60s	★
	When inverter is running , the defined DI terminal is valid, after the full water delay A1-28, the full water protection alarm A-TF will be reported, and the inverter will automatically stop. Note: No. 52 function is defined through DI terminal, ON enable			
A1-38	Full water reset delay	0~30000s	120s	★
	When the inverter is under full-water protection warning (A-TF), and the currently running command is valid, after full water reset delay A1-38, the full-water protection alarm will be automatically cleared and inverter will be started.			
A1-39	Empty water delay	0~30000s	60s	★
	when inverter is running , the defined DI terminal is valid, after shortage water delay time A1-39，shortage water protection alarm A-LL will be reported, inverter will be started. Note: No. 52 function is defined through DI terminal, ON enable			
A1-40	Empty water reset delay	0~30000s	600s	★
	shortage Water reset delay setting. If the inverter is under shortage water protection warning (A-LL) and the currently running command is valid, after shortage water reset delay A1-40, the shortage water protection alarm will be automatically cleared and the inverter will start.			
Alarm Stop Code				
A-LP	Low-voltage sleep	Lower than value of A1-09, will give Low-voltage sleep alarm		
A-LS	Light dormancy	Meet the conditions of A1-22/23, give light dormancy alarm		
A-LL1	Underload protection	Meet the conditions of A1-25/26, give Underload protection alarm		
A-TF	Full water protection	Define DI terminal to 52, enable ON		
A-LL	Empty water protection	Define DI terminal to 53, enable ON		

Group b0: Basic Function Parameters

Code	Parameter Name	Functional description	Default	Property
b0-01	Motor control mode	0: Sensor-less vector control (SVC) 1/2:V/F control 3: Closed-loop vector control (FVC)	2	★
b0-02	Command source selection	0: Keypad control (LED off) 1: Terminal control (LED on) 2: Communication control (LED blinking)	0	★
b0-03	Main frequency source X selection	0: Digital setting (Digital setting frequency b0-12, UP/DOWN modifiable, no-record after power off) 1: Digital setting (Digital setting frequency b0-12, UP/DOWN modifiable, record after power off) 2: AI1 3: AI2 4: AI3 5: Pulse setting (HDI) 6: Multi-function	1	★

Code	Parameter Name	Functional description	Default	Property
		7:Built-in PLC 8: PID 9: Communication setting		
b0-04	Auxiliary frequency source Y selection	The same as b0-03 (Main frequency source X selection)	0	★
b0-05	Selection of auxiliary frequency Y range	0: Relative to maximum frequency 1: Relative to main frequency X	0	☆
b0-06	Range of auxiliary frequency Y	0%~150%	100%	☆
b0-07	Frequency source selection	Unit's digit: Frequency source selection. 0: Main frequency source X 1: X and Y calculation (calculation result determined by ten's digit) 2: Switchover between X and Y 3: Switchover between X and "X and Y calculation" 4: Switchover between Y and "X and Y calculation" Ten's digit: X and Y calculation relationship 0: X+Y 1: X-Y 2: Maximum of them 3: Minimum of them	0	☆
b0-08	Encoder knob frequency change unit	0:1Hz 1:0.1Hz 2:0.2Hz	0	☆
b0-09	Binding command source to frequency source	Unit's digit: Binding keypad command to following frequency source. 0: No binding 1: Digital setting frequency 2: AI1 3: AI2 4: AI3 5: Pulse setting (HDI) 6: Multi-function 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: Automatically running binding to frequency source. 0~9, same as unit's digit	0	☆
b0-10	Record of digital setting frequency of power failure	0: not record 1:record	1	☆
b0-11	Frequency unit	1: 0.1 Hz 2: 0.01 Hz	2	☆

Code	Parameter Name	Functional description	Default	Property
b0-12	Digital setting frequency	0.00 ~ maximum frequency (b0-13)	50.00 Hz	☆
b0-13	Maximum frequency	50.00~3000.00 Hz	50.00 Hz	☆
b0-14	Source of frequency upper limit	0: Set by (b0-15) 1: AI1 2: AI2 3: AI3 4: Pulse setting (HDI) 5: Communication setting	0	☆
b0-15	Frequency upper limit	Frequency lower limit (b0-17) ~ maximum frequency (b0-13)	50.00 Hz	☆
b0-16	Frequency upper limit offset	0.00 Hz~ maximum frequency(b0-13)	0.00 Hz	☆
b0-17	Frequency lower limit	0.00 Hz ~frequency upper limit(b0-15)	0.00 Hz	☆
b0-18	Rotation direction	0: Forward direction 1: Reverse direction	0	☆
b0-19	Base frequency for UP/ DOWN modification during running	0: Running frequency 1: Setting frequency	0	★
b0-20	Acceleration/Deceleration mode	0: Linear acceleration/ deceleration 1: S-curve acceleration/deceleration A 2: S-curve acceleration/deceleration B	0	☆
b0-21	Acceleration time 1	0.00s~650.00s (b0-25 = 2) 0.0s~6500.0s (b0-25 = 1) 0s~65000s (b0-25 = 0)	Model dependent	☆
b0-22	Deceleration time 1	0.00s~650.00s (b0-25 = 2) 0.0s~6500.0s (b0-25 = 1) 0s~65000s (b0-25 = 0)	Model dependent	☆
b0-23	Time proportion of S-curve start segment	0.0% ~ (100.0% minus b0-24)	30.0%	☆
b0-24	Time proportion of S-curve end segment	0.0% ~ (100.0% minus b0-23)	30.0%	☆
b0-25	Acceleration/Deceleration time unit	0:1s 1: 0.1s 2: 0.01s	1	☆
b0-26	Acceleration/Deceleration time base frequency	0: Maximum frequency (b0-13) 1: Set frequency 2: 100 Hz	0	★

Group b1: Start and Stop Control Parameters

Code	Parameter Name	Functional description	Default	Property
b1-00	Start mode	0: Direct start 1: Rotational speed tracking restart 2: Pre-excited start (AC asynchronous motor)	0	★
b1-01	Rotational speed tracking mode	0: From frequency at stop 1: From zero speed 2: From maximum frequency	0	★
b1-02	Rotational speed tracking ratio	1~100	20	★
b1-03	Startup frequency	0.00~10.00 Hz	0.00 Hz	☆

b1-04	Startup frequency holding time	0.0s~100.0s	0.0s	★
b1-05	Startup DC braking current/ Pre-excited current	0%~100%	0%	★
b1-06	Startup DC braking time/ Pre-excited time	0.0s~100.0s	0.0s	★
b1-07	Stop mode	0: Decelerate to stop 1: free stop	0	☆
b1-08	DC braking initial frequency of stopping	0.00 Hz ~ maximum frequency	0.00 Hz	☆
b1-09	DC braking waiting time of stopping	0.0s~100.0s	0.0s	★
b1-10	DC braking current of stopping	0%~100%	0%	★
b1-11	DC braking time of stopping	0.0s~100.0s	0.0s	★

Group b2: Auxiliary Function

Code	Parameter Name	Functional description	Default	Property
b2-00	JOG running frequency	0.00 Hz ~ maximum frequency	2.00 Hz	☆
b2-01	JOG acceleration time	0.0s~6500.0s	Model dependent	☆
b2-02	JOG deceleration time	0.0s~6500.0s	Model dependent	☆
b2-03	Acceleration time 2	0.0s~6500.0s	Model dependent	☆
b2-04	Deceleration time 2	0.0s~6500.0s	Model dependent	☆
b2-05	Acceleration time 3	0.0s~6500.0s	Model dependent	☆
b2-06	Deceleration time 3	0.0s~6500.0s	Model dependent	☆
b2-07	Acceleration time 4	0.0s~6500.0s	Model dependent	☆
b2-08	Deceleration time 4	0.0s~6500.0s	Model dependent	☆
b2-09	Jump frequency 1	0.00 Hz ~maximum frequency	0.00 Hz	☆
b2-10	Jump frequency 2	0.00 Hz ~ maximum frequency	0.00 Hz	☆
b2-11	Frequency jump amplitude	0.00 Hz ~ maximum frequency	0.00Hz	☆
b2-12	Jump frequency during acceleration/ deceleration	0: Disabled 1: Enabled	0	☆
b2-13	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00 Hz ~ maximum frequency	0.00Hz	☆
b2-14	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00 ~ maximum frequency	0.00Hz	☆
b2-15	Reverse running	0: Enabled 1: Disabled	0	☆

b2-16	Forward/Reverse rotation dead-zone time	0.0~3000.0s	0.0s	☆
b2-17	Running mode when set frequency less than limited lower frequency	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	0	☆
b2-18	Droop control	0.00Hz~10.00 Hz	0.00Hz	☆
b2-19	Terminal JOG priority	0: Disabled 1: Enabled	0	☆
b2-21	Setting running time reach threshold	0~65000 h	0h	☆
b2-22	Action after running time reached	0: Continue to run 1: Stop	0	☆
b2-23	Cooling fan control	0: Fan working during running 1: Fan working during power on	0	☆
b2-24	Dormant frequency	0.00Hz ~wakeup frequency (b2-26)	0.00Hz	☆
b2-25	Dormant delay time	0.0s~6000.0s	0.0s	☆
b2-26	Wakeup frequency	Dormant frequency (b2-24)~ maximum frequency (b0-13)	0.00Hz	☆
b2-27	Wakeup delay time	0.0s~6000.0s	0.0s	☆
b2-28	Timing function	0: Disabled 1: Enabled	0	☆
b2-29	Timing duration source	0: b2-30 1: AI1 2: AI2 3: AI3 (100% of analog input corresponds to the value of b2-30)	0	☆
b2-30	Set timing duration	0.0min~6500.0 min	0.0min	☆
b2-31	This time running time reached threshold	0.0min~6500.0 min	0.0min	☆
b2-32	DI terminal status after power on	0: Valid 1: Invalid	0	☆

Group b3: Switch Input Terminal Parameters

Code	Parameter Name	Functional description	Default	Property
b3-00	DI1 function selection	0: No function 1: Forward RUN (FWD) or running command 2: Reverse RUN (REV) or FWD/REV running direction 3: Three-line control	01	★
b3-01	DI2 function selection	4: Forward JOG (FJOG)	02	★
b3-02	DI3 function selection	5: Reverse JOG (RJOG)	06	★
b3-03	DI4 function selection	6: Multi-function terminal 1	07	★
b3-04	DI5 function selection	7: Multi-function terminal 2	38	★
b3-05	reserved control terminal for expansion	8: Multi-function terminal 3 9: Multi-function terminal 4 10: Terminal UP 11: Terminal DOWN 12: clear to zero of UP and DOWN setting (terminal, keypad) 13: Terminal 1 for acceleration/ deceleration time	00	★

		selection 14: Terminal 2 for acceleration/ deceleration time selection		
b3-06	HDI function selection	15: Frequency source switchover 16: Switchover between main frequency source X and digital setting frequency 17: Switchover between auxiliary frequency source Y and digital setting frequency 18:Terminal 1 for Command source switchover 19: Terminal 2 for Command source switchover 20: Speed control/Torque control switchover 21: Torque control prohibited 22: PID pause 23: PID integral pause 24: Reverse PID action direction 25: PID parameter switchover 26: PLC status reset 32: Pulse input (enabled only for HDI) 33: Frequency modification enable 34:Acceleration/Deceleration prohibited 36: Motor selection terminal 2(reserve) 37: Fault reset 38: Normally open (NO) input of external fault 39: Normally closed (NC) input of external fault 40: User-defined fault 1 41: User-defined fault 2 42: Running pause 43: Free stop 44: Emergency stop 45: External STOP terminal 1 46: External STOP terminal 2 47: Deceleration DC braking 48: Immediate DC braking 49: Clear the current running time 52: Water full protection 53: Water shortage protection	32	★
b3-12	DI filter time	0.000s~1.000s	0.010s	☆
b3-13	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	★
b3-14	Rate of UP/DOWN terminal	0.001Hz/s~65.535 Hz/s	1.000 Hz/s	☆
b3-15	DI1 ON delay time	0.0s~3000.0s	0.0s	☆
b3-16	DI1 OFF delay time	0.0s~3000.0s	0.0s	☆
b3-17	DI2 ON delay time	0.0s~3000.0s	0.0s	☆

b3-18	DI2 OFF delay time	0.0s~3000.0s	0.0s	☆
b3-19	DI3 ON delay time	0.0s~3000.0s	0.0s	☆
b3-20	DI3 OFF delay time	0.0s~3000.0s	0.0s	☆
b3-21	DI4 ON delay time	0.0s~3000.0s	0.0s	☆
b3-22	DI4 OFF delay time	0.0s~3000.0s	0.0s	☆
b3-23	DI5 ON delay time	0.0s~3000.0s	0.0s	☆
b3-24	DI5 OFF delay time	0.0s~3000.0s	0.0s	☆
b3-25	DI valid selection 1	Unit's digit: DI1 valid mode. 0: High level valid 1: Low level valid Ten's digit: DI2 valid mode. 0, 1 (same as DI1) Hundred's digit: DI3 valid mode. 0, 1 (same as DI1) Thousand's digit: DI4 valid mode. 0, 1 (same as DI1) Ten thousand's digit: DI5 valid mode. 0, 1 (same as DI1)	00000	★

Group b4: Switch Signal Output Terminals

Code	Parameter Name	Functional description	Default	Property
b4-00	FM terminal output mode	0: Pulse output 1: Open- collector output terminal	0	☆
b4-01	FMR function (open-collector output terminal)	0: No output 1: Ready signal 2: Frequency inverter running 3: Fault output (free stop fault) 4: Fault output (free stop fault, but do not output when lower voltage)	0	☆
b4-02	Relay 1 function (TA1-TB1-TC1)	5: Swing frequency limit 6: Torque limit 7: Frequency upper limit reached 8:Frequency lower limit reached (relevant to running) 9: Frequency lower limit reached (having output at stop) 10: Reverse running	3	☆
b4-03	Relay 2 function (TA2-TB2-TC2)	11: Zero-speed running (no output at stop) 12: Zero-speed running 2 (having output at stop) 16: PLC cycle complete 17: Frequency-level detection FDT1 output 18: Frequency level detection FDT2 output 19: Frequency reached 20: Frequency 1 reached 21: Frequency 2 reached 22: Current 1 reached 23: Current 2 reached 24: Module temperature reached 25: Timing reached 26: Zero current state 27: Output current exceeded limitation 28: Lower voltage state output	2	☆

		29: Frequency inverter overload pre-warning 30: Motor overheat pre-warning 31: Motor overload pre-warning 32: off load 33: AI1 larger than AI2 34: AI1 input exceeded limitation 35: Alarm output (all faults) 36: Present running time reached 37: Accumulative power-on time reached 38: Accumulative running time reached		
b4-10	FMR ON delay time	0.0s~3000.0s	0.0s	☆
b4-11	FMR OFF delay time	0.0s~3000.0s	0.0s	☆
b4-12	Relay 1 ON delay time	0.0s~3000.0s	0.0s	☆
b4-13	Relay 1 OFF delay time	0.0s~3000.0s	0.0s	☆
b4-14	Relay 2 ON delay time	0.0s~3000.0s	0.0s	☆
b4-15	Relay 2 OFF delay time	0.0s~3000.0s	0.0s	☆
b4-20	DO logic selection 1	Unit's digit: FMR valid mode. 0: Positive logic 1: Negative logic Ten's digit: Relay 1 valid mode. 0, 1 (same as FMR) Hundred's digit: Relay 2 valid mode. 0, 1 (same as FMR) Thousand's digit: DO1 valid mode. 0, 1 (same as FMR) Ten thousand's digit: DO2 valid mode. 0, 1 (same as FMR)	00000	☆
b4-22	Frequency detection value 1 (FDT1)	0.00 Hz~ maximum frequency	50.00 Hz	☆
b4-23	Frequency detection hysteresis 1 (FDT hysteresis 1)	0.0%~100.0% (FDT1 level)	5.0%	☆
b4-24	Detection width of frequency	0.00% ~ 100%(maximum frequency)	0.0%	☆
b4-25	Frequency detection value 2 (FDT2)	0.00 Hz ~ maximum frequency	50.00HZ	☆
b4-26	Frequency detection hysteresis 2 (FDT hysteresis 2)	0.00~100% (maximum frequency)	5.0%	☆
b4-27	Any frequency reaching detection value 1	0.00 Hz ~ maximum frequency	50.00 Hz	☆
b4-28	Any frequency reaching detection amplitude 1	0.0%~100.0% (maximum frequency)	0.0%	☆
b4-29	Any frequency reaching detection value 2	0.00 Hz ~ maximum frequency	50.00 Hz	☆
b4-30	Any frequency reaching detection amplitude 2	0.0%~100.0% (maximum frequency)	0.0%	☆
b4-31	Zero current detection level	0.0%~100.0% (rated motor current)	5.0%	☆
b4-32	Zero current detection delay	0.00s~600.00s	0.10s	☆

Code	Parameter Name	Functional description	Default	Property
	time			
b4-33	Over current output threshold	0.0%~300.0% (rated motor current)	200.0%	☆
b4-34	Over current output detection delay time	0.00s~600.00s	0.00s	☆
b4-35	Any current reaching 1	0.0%~100.0% (rated motor current)	100.0%	☆
b4-36	amplitude of any current reaching 1	0.0%~100.0% (rated motor current)	0.0%	☆
b4-37	Any current reaching 2	0.0%~100.0% (rated motor current)	100.0%	☆
b4-38	Amplitude of any current reaching 2	0.0%~100.0% (rated motor current)	0.0%	☆
b4-39	IGBT module temperature threshold	25~100°C	75°C	☆

Group b5: Pulse/Analog Input Trminals

Code	Parameter Name	Functional description	Default	Property
b5-00	Pulse minimum input(HDI)	0.00 kHz ~b5-02	0.00 kHz	☆
b5-01	Corresponding setting of pulse minimum input	-100.00% ~100.0%	0.00%	☆
b5-02	Pulse maximum input	b5-00 ~ 100.00 kHz	50.00 kHz	☆
b5-03	Corresponding setting of pulse maximum input	-100.00% ~100.0%	100.0%	☆
b5-04	Pulse filter time	0.00s~10.00s	0.10s	☆
b5-05	AI1 input voltage lower limit of protection	0.00 V~ b5-06	3.10 V	☆
b5-06	AI1 input voltage upper limit of protection	b5-05~10.00 V	6.80 V	☆
b5-07	AI1input minimum value	0.00 V ~ b5-15	0.00V	☆
b5-08	Corresponding setting of AI1 minimum input	-100.00% ~100.0%	0.0%	☆
b5-09	AI1Maximum input value	0.00V~10.00V	10.00V	☆
b5-10	Corresponding setting ofAI1Maximum input value	-100.0%~100.0%	100.0%	☆
b5-11	AI1input filter time	0.00s~10.00s	0.10s	☆
b5-12	AI2 input minimum value	0.00V~10.00V	2.00V	☆
b5-13	Corresponding setting of AI2 minimum input	-100.0%~100.0%	0.0%	☆
b5-14	AI2 Maximum input value	0.00V~10.00V	10.00V	☆
b5-15	Corresponding setting ofAI2Maximum input value	-100.0%~100.0%	100.0%	☆
b5-16	AI2 input filter time	0.00s~10.00s	0.10s	☆
b5-17	AI3 input minimum value	-10.00V~10.00V	-10.00V	☆
b5-18	Corresponding setting of AI3 minimum input	-100.0%~100.0%	-100.0%	☆
b5-19	AI3 Maximum input value	-10.00V~10.00V	10.00V	☆
b5-20	Corresponding setting ofAI3Maximum input value	-100.0%~100.0%	100.0%	☆
b5-21	AI3 input filter time	0.00s~10.00s	0.10s	☆

b5-22	AI curve 4 minimum input	-10.00V~b5-24	0.00V	☆
b5-23	Corresponding setting ofAI curve 4 minimum input	-100.0%~+100.0%	0.0%	☆
b5-24	AI curve 4inflection point 1 input	B5-21~b5-26	3.00V	☆
b5-25	Corresponding setting of AI curve 4 inflection point 1 input	-100.0%~+100.0%	30.0%	☆
b5-26	Corresponding setting of AI curve 4 inflection point 2 input	b5-23~b5-27	6.00V	☆
b5-27	AI curve 4 inflection point 2 input	-100.0%~+100.0%	60.0%	☆
b5-28	AI curve 4 Maximum input	b5-27~+10.00V	10.00V	☆
b5-29	Corresponding setting of AI curve 4 Maximum input	-100.0%~+100.0%	100.0%	☆
b5-30	AI curve 5 minimum input	-10.00V~b5-31	-10.00V	☆
b5-31	Corresponding settingof AI curve 5 minimum input	-100.0%~+100.0%	-100.0%	☆
b5-32	AI curve 5 inflection point 1 input	b5-28~b5-33	-3.00V	☆
b5-33	Corresponding setting of AI curve 5 inflection point 1 input	-100.0%~+100.0%	-30.0%	☆
b5-34	AI curve 5 inflection point 2 input	b5-31~b5-35	3.00V	☆
b5-35	Corresponding settingof AI curve 5 inflection point 2 input	-100.0%~+100.0%	30.0%	☆
b5-36	AI curve 5 Maximum input	b5-33~+10.00V	10.00V	☆
b5-37	Corresponding settingof AI curve 5 Maximum input	-100.0%~+100.0%	100.0%	☆
b5-38	AI1jump point	-100.0%~100.0%	0.0%	☆
b5-39	AI1 jump amplitude	0%~100.0%	0.5%	☆
b5-40	AI2jump point	-100.0%~100.0%	0.0%	☆
b5-41	AI2 jump amplitude	0%~100.0%	0.5%	☆
b5-42	AI3jump point	-100.0%~100.0%	0.0%	☆
b5-43	AI3 jump amplitude	0%~100.0%	0.5%	☆
b5-44	AI curve selection	Unit's digit:AI1 curve selection 1: curve 1(2 point, refer b5-07~b5-10) 2: curve 2(2 point, refer b5-12~b5-15) 3: curve 3(2 point, refer b5-17~b5-20) 4: curve 4(4 point, refer b5-22~b5-29) 5: curve 5(4 point, refer b5-30~b5-37) Ten's digit:AI2curve selection,same as above Hundred's digit:AI3 curve selection,same as above	H321	☆
b5-45	AI lower than minimum input setting selection	Unit's digit:AI1 lower than minimum input setting 0:corresponding minimum input setting 1:0.0% Ten's digit:AI2 lower than minimum input setting selection, same as above Hundred's digit:AI3 lower than minimum input setting selection, same as above	H.000	☆

Group b6: Pulse/Analog Output Terminals

Code	Parameter Name	Functional description	Default	Property
b6-00	FMP function selection	0: Running frequency corresponding to 0~Max. operation frequency 1: Set frequency corresponding to 0~Max. operation frequency 2: Output current corresponding to 0~Doubled motor rated current 3: Output torque (absolute value) corresponding to 0~double rated torque	0	☆
b6-01	AO1 output function selection	4: Output power corresponding to 0~Doubled motor rated power 5: Output voltage corresponding to 0~1.2 times DC bus voltage 6: Pulse input corresponding to 0Hz~100kHz 7: AI1 corresponding to 0~10V 8: AI2 corresponding to 0~10V	0	☆
b6-02	AO2 output function selection	9: AI3 corresponding to 0~10V 12: Communication setting corresponding to 0~32767 13: Motor rotational speed corresponding to 0~Max. operation frequency 14: Output current corresponding to 0~1000A 15: Output voltage corresponding to 0~1000V 16:: Output torque corresponding to (-200%~200%) motor rated torque	1	☆
b6-03	Maximum FMP output frequency	0.01 kHz ~100.00 kHz	50.00 kHz	☆
b6-04	AO1 offset coefficient	-100.0% ~100.0%	0.0%	☆
b6-05	AO1 gain	-10.00~10.00	1.00	☆
b6-06	AO2 offset coefficient	-100.0% ~100.0%	0.00%	☆
b6-07	AO2 gain	-10.00 ~10.00	1.00	☆

Group b9: Keypad and Display

Code	Parameter Name	Functional description	Default	Property
b9-00	STOP/RESET key function	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	1	☆
b9-01	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 5. Function parameters	3	☆
b9-02	LED display running parameters 1	0000~FFFF Bit00: Running frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: DC bus voltage (V)	H.001F	☆

		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		
b9-03	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 calibration (V) Bit06: AI2 voltage before calibration (V) Bit07: AI3 voltage before calibration (V) Bit08: Linear speed Bit09: Received Bit10: Present running time (Min) Bit11: Heat sink temperature display (℃) Bit12: Communication setting value Bit13: Encoder feedback frequency (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)	H.0000	☆
b9-04	LED display parameter of stopping	0000~FFFF Bit00: Setting frequency (Hz) Bit01: DC 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) Bit13:Heatsink temperature display(°C)	H.0033	☆
b9-05	Load speed display coefficient	0.0001~ 6.5000	0.2920	☆
b9-06	Number of decimal places for load speed display	0: 0 decimal display 1: 1 decimal display 2: 2 decimal display	0	☆

Code	Parameter Name	Functional description	Default	Property
		3: 3 decimal display		
b9-07	Heatsink temperature	0.0℃ ~100.0℃	--	●
b9-08	Accumulative running time	0~65535 h	--	●
b9-09	Accumulative power-on time	0~65535 h	--	●
b9-11	Auxiliary LED display parameters	Corresponding U0 group parameters	00004	●

Group bA: Communication Parameters

Code	Parameter Name	Functional description	Default	Property
bA-00	Communication type selection	0: Modbus protocol	0	☆
bA-01	Baud ratio setting	Unit's digit: Modbus baud ratio. 0: 300 BPS 1: 600 BPS 2: 1200 BPS 3: 2400 BPS 4: 4800 BPS 5: 9600 BPS 6: 19200 BPS 7: 38400 BPS	5	☆
bA-02	Modbus 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	☆
bA-03	Broadcast address	0~247　(0: Broadcast address) Valid for Modbus	1	☆
bA-04	Modbus response delay	0~20 ms Only valid for Modbus	2 ms	☆
bA-05	Communication timeout	0.0s:invalid 0.1s~60.0s Valid for Modbus	0.0s	☆
bA-06	Modbus protocol data transmission format selection	Unit's digit: Modbus protocol. 0: Non-standard Modbus protocol 1: Standard Modbus protocol Ten's digit: Profibus-DP 0:PP01 1:PP02 2:PP03 3:PP05	31	☆
bA-07	Communication reading current resolution	0: 0.01A 1: 0.1A	0	☆

Group bb: Fault and Protection Setting

Code	Parameter Name	Functional description	Default	Property
bb-00	G/P type selection	0: P type 1: G type	1	☆
bb-01	Motor overload protection selection	0: Disabled 1: Enabled	1	☆

bb-02	Motor overload protection gain	0.20~10.00	1.00	☆
bb-03	Motor overload pre-warning coefficient	50%~100%	80%	☆
bb-09	Fault auto reset times	0~20(Unlimited number of times)	0	☆
bb-10	Relay action selection during fault auto reset	0: Not act 1: Act	0	☆
bb-11	Time interval of fault auto reset	0.1s~100.0s	1.0s	☆
bb-12	Input phase loss protection/contactor energizing protection selection	Unit's digit: Input phase loss protection 0: Disabled 1: Enabled Ten's digit: Contactor energizing protection 0,1(same as Unit's digit)	11	☆
bb-13	Output phase loss protection	0: Disabled 1: Enabled	1	☆
bb-14	Off load protection	0: Disabled 1: Enabled	0	☆
bb-15	Off load detection level	0.0%~100.0% (rated motor current)	10.0%	☆
bb-16	Off load detection time	0.0s~60.0s	1.0s	☆
bb-17	Over-speed detection value	0.0%~50.0% (maximum frequency)	20.0%	☆
bb-18	Over-speed detection time	0.0s~60.0s	1.0s	☆
bb-19	Detection value of too large speed deviation	0.0%~50.0% (maximum frequency)	20.0%	☆
bb-20	Detection time of too large speed deviation	0.0s~60.0s	5.0s	☆
bb-21	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	0	☆
bb-22	Judging voltage of instantaneous power failure restoring	60.0%~100.0%(standard bus voltage)	85.0%	☆
bb-23	judging time of Instantaneous power rise	0.00s~100.00s	0.50s	☆
bb-24	Judging voltage of instantaneous power failure	60.0%~100.0% (standard bus voltage)	80.0%	☆
bb-25	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	0	☆
bb-26	Motor overheat protection threshold	0°C~200°C	110°C	☆
bb-27	Motor overheat pre-warning threshold	0°C~200°C	90°C	☆
bb-28	Overvoltage threshold	200.0~2500.0 V	Model dependent	☆
bb-29	Under voltage threshold	200.0V~2000.0V	Model dependent	☆
bb-30	Brake unit use ratio	0%~100%	100%	☆

bb-32	Fault protection action selection 1	Unit's digit: Motor overload, Err11. 0: Free stop 1: Stop according to the stop mode 2: Continue to run Ten's digit: Power input phase loss, Err12. Same as unit's digit Hundred's digit: Power output phase loss, Err13. Same as unit's digit Thousand's digit: External equipment fault, Err15. Same as unit's digit Ten thousand's digit: Communication fault, Err16. Same as unit's digit	00000	☆
bb-33	Fault protection action selection 2	Unit's digit: Encoder/PG card fault, Err20. 0: Free stop Ten's digit: EEPROM read-write fault, Err21. 0: Free stop 1: Stop according to the stop mode Hundred's digit : Reserved Thousand's digit: Motor Overheat, Err25. Same as unit's digit in bb-32 Ten thousand's digit: Running time reached, Err26. Same as unit's digit in bb-32	00000	☆
bb-34	Fault protection action selection 3	Unit's digit: User-defined fault 1,Err27. Same as unit's digit in bb-32 Ten's digit: User-defined fault 2,Err28. Same as unit's digit in bb-32 Hundred's digit: Accumulative power-on time reached,Err29. Same as unit's digit in bb-32 Thousand's digit: Off load, Err30. 0: Free stop 1: Stop according to the stop mode 2: reduce to 7% of rated motor frequency and continue running. If the load recovers and it will auto regain to setting frequency. Ten thousand's digit: PID feedback lost during running, Err31. Same as unit's digit in bb-32	00000	☆
bb-35	Fault protection action selection 4	Unit's digit: Speed deviation too large, Err42 Same as unit's digit in bb-32 Ten's digit: Motor over-speed, Err43. Same as unit's digit in bb-32 Hundred's digit: Initial position fault, Err51. Same as unit's digit in bb-32	00000	☆
bb-37	Frequency selection for continuing to run of fault	0: Current running frequency 1: Set frequency 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency of abnormality (bb-37)	0	☆

Code	Parameter Name	Functional description	Default	Property
bb-38	Backup frequency of abnormality	0.0%~100.0% (maximum frequency)	100.0%	☆
bb-39	Inverter overload protection gain	85%-115%	100%	

Group bC: Fault Diagnosis

Code	Parameter Name	Functional description	Default	Property
bC-00	First fault type	–	–	●
bC-01	Second fault type	–	–	●
bC-02	Third fault type (latest)	–	–	●
bC-03	Frequency of latest fault	–	–	●
bC-04	Current of latest fault	–	–	●
bC-05	DC Bus voltage of latest fault	–	–	●
bC-06	Input terminals status of latest fault	–	–	●
bC-07	Output terminal status of latest fault	–	–	●
bC-08	Frequency inverter status of latest fault	–	–	●
bC-09	Power-on time of latest fault	–	–	●
bC-10	Running time of latest fault	–	–	●
bC-11	Frequency of 2nd fault	–	–	●
bC-12	Current of 2nd fault	–	–	●
bC-13	DC Bus voltage of 2nd fault	–	–	●
bC-14	Input terminal status of 2nd fault	–	–	●
bC-15	Output terminal status of 2nd fault	–	–	●
bC-16	Frequency inverter status of 2nd fault	–	–	●
bC-17	Power-on time of 2nd fault	–	–	●
bC-18	Running time of 2nd fault	–	–	●
bC-19	Frequency of 1st fault	–	–	●
bC-20	Current of 1st fault	–	–	●
bC-21	DC Bus voltage of 1st fault	–	–	●
bC-22	Input terminal status of 1st fault	–	–	●
bC-23	Output terminal status of 1st fault	–	–	●
bC-24	Frequency inverter status of 1st fault	–	–	
bC-25	Power-on time of 1st fault	–	–	●
bC-26	Running time of 1st fault	–	–	●

Group bd: Motor Protection

Code	Parameter Name	Functional description	Default	Property
bd-00	Overset alarm current value	0.0~600A	0.00	☆

Code	Parameter Name	Functional description	Default	Property
bd-01	Overcurrent alarm delay time	0.0~600s	0.00	☆

Group C0: PID Control Function

Code	Parameter Name	Functional description	Default	Property
C0-00	PID setting source	0: C0-01 1: AI1 2: AI2 3: AI3 4: Pulse setting (HDI) 5: Communication setting 6: Multi-function 7: New Mode(Pressure Mode)	7	☆
C0-01	PID digital setting	0.0%~100.0%	50.0%	☆
C0-02	PID setting change time	0.00s~650.00s	0.00s	☆
C0-03	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 – AI2 4: Pulse setting (HDI) 5: Communication setting 6: AI1 + AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	☆
C0-04	PID action direction	0: Forward action 1: Reverse action	0	☆
C0-05	PID setting feedback range	0~65535	1000	☆
C0-06	Proportional gain KP1	0.00~100.0	20.0	☆
C0-07	Integral time TI1	0.01s~10.00s	0.80s	☆
C0-08	Differential time TD1	0.000s~10.000s	0.000s	☆
C0-09	Proportional gain KP2	0.00~100.00	20.0	☆
C0-10	Integral time TI2	0.01s~10.00s	2.00s	☆
C0-11	Differential time TD2	0.00s~10.00s	0.000s	☆
C0-12	PID parameter switchover condition	0: No switchover 1: Switchover via DI 2: Automatic switchover based on deviation	0	☆
C0-13	PID parameter switchover deviation 1	0.0% ~ C0-14	20.0%	☆
C0-14	PID parameter switchover deviation 2	C0-13 ~ 100.0%	80.0%	☆
C0-15	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	☆
C0-16	PID initial value	0.0%~100.0%	0.0%	☆
C0-17	PID initial value holding time	0.00s~650.00s	0.00s	☆

C0-18	Frequency upper limit of PID reverse rotation	0.00 ~ maximum frequency	0.00 Hz	☆
C0-19	PID deviation limit	0.0%~100.0%	0.0%	☆
C0-20	PID differential limit	0.00%~100.00%	0.10%	☆
C0-21	Maximum positive deviation between two PID outputs	0.00%~100.00%	1.00%	☆
C0-22	Maximum negative deviation between two PID outputs	0.00%~100.00%	1.00%	☆
C0-23	PID feedback filter time	0.00s~60.00s	0.00s	☆
C0-24	PID output filter time	0.00s~60.00s	0.00s	☆
C0-25	Detection value of PID feedback loss	0.0%: Not judging feedback loss 0.1%~100.0%	0.0%	☆
C0-26	Detection time of PID feedback loss	0.0s~20.0s	0.0s	☆
C0-27	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	1	☆

Group C1: Multi-function

Code	Parameter Name	Functional description	Default	Property
C1-00	Multi-function 0	-100.0%~100.0%	0.0%	☆
C1-01	Multi-function 1	-100.0%~100.0%	0.0%	☆
C1-02	Multi-function 2	-100.0%~100.0%	0.0%	☆
C1-03	Multi-function 3	-100.0%~100.0%	0.0%	☆
C1-04	Multi-function 4	-100.0%~100.0%	0.0%	☆
C1-05	Multi-function 5	-100.0%~100.0%	0.0%	☆
C1-06	Multi-function 6	-100.0%~100.0%	0.0%	☆
C1-07	Multi-function 7	-100.0%~100.0%	0.0%	☆
C1-08	Multi-function 8	-100.0%~100.0%	0.0%	☆
C1-09	Multi-function 9	-100.0%~100.0%	0.0%	☆
C1-10	Multi-function 10	-100.0%~100.0%	0.0%	☆
C1-11	Multi-function 11	-100.0%~100.0%	0.0%	☆
C1-12	Multi-function 12	-100.0%~100.0%	0.0%	☆
C1-13	Multi-function 13	-100.0%~100.0%	0.0%	☆
C1-14	Multi-function 14	-100.0%~100.0%	0.0%	☆
C1-15	Multi-function 15	-100.0%~100.0%	0.0%	☆
C1-16	Multi-function 0 source	0: Set by C1-00 1: AI1 2: AI2 3: AI3 4: Pulse setting(HDI) 5: PID 6: Set by digital setting frequency (b0-12), modified via terminal UP/ DOWN	0	☆

Group C2: Simple PLC

Code	Parameter Name	Functional description	Default	Property
C2-00	Simple PLC running mode	0: Stop after the Frequency inverter runs one cycle 1: Keep final values after the frequency inverter runs one	0	☆

		cycle 2: Repeat after the frequency inverter runs one cycle		
C2-01	Simple PLC record selection	Unit's digit: Record of power failure. 0: no record after power off 1: record after power off Ten's digit: Record of stopping. 0: no record after stopping 1:record after stopping	00	☆
C2-02	Running time of simple PLC Segment 0	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-03	Acceleration/deceleration time of simple PLC Segment 0	0~3	0	☆
C2-04	Running time of simple PLC Segment 1	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-05	Acceleration/deceleration time of simple PLC Segment 1	0~3	0	☆
C2-06	Running time of simple PLC Segment 2	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-07	Acceleration/deceleration time of simple PLC Segment 2	0~3	0	☆
C2-08	Running time of simple PLC Segment 3	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-09	Acceleration/deceleration time of simple PLC Segment 3	0~3	0	☆
C2-10	Running time of simple PLC Segment 4	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-11	Acceleration/deceleration time of simple PLC Segment 4	0~3	0	☆
C2-12	Running time of simple PLC Segment 5	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-13	Acceleration/deceleration time of simple PLC Segment 5	0~3	0	☆
C2-14	Running time of simple PLC Segment 6	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-15	Acceleration/deceleration time of simple PLC Segment 6	0~3	0	☆
C2-16	Running time of simple PLC Segment 7	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-17	Acceleration/deceleration time of simple PLC Segment 7	0~3	0	☆
C2-18	Running time of simple	0.0s(h)~6553.5s(h)	0.0s (h)	☆

Code	Parameter Name	Functional description	Default	Property
	PLC Segment 8			
C2-19	Acceleration/deceleration time of simple PLC Segment 8	0~3	0	☆
C2-20	Running time of simple PLC Segment 9	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-21	Acceleration/deceleration time of simple PLC Segment 9	0~3	0	☆
C2-22	Running time of simple PLC Segment 10	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-23	Acceleration/deceleration time of simple PLC Segment 10	0~3	0	☆
C2-24	Running time of simple PLC Segment 11	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-25	Acceleration/deceleration time of simple PLC Segment 11	0~3	0	☆
C2-26	Running time of simple PLC Segment 12	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-27	Acceleration/deceleration time of simple PLC Segment 12	0~3	0	☆
C2-28	Running time of simple PLC Segment 13	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-29	Acceleration/deceleration time of simple PLC Segment 13	0~3	0	☆
C2-30	Running time of simple PLC Segment 14	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-31	Acceleration/deceleration time of simple PLC Segment 14	0~3	0	☆
C2-32	Running time of simple PLC Segment 15	0.0s(h)~6553.5s(h)	0.0s (h)	☆
C2-33	Acceleration/deceleration time of simple PLC Segment 15	0~3	0	☆
C2-34	Time unit of simple PLC running	0: s (second) 1: h (hour)	0	☆

Group C3: Constant Pressure Water Supply Parameters

Code	Parameter Name	Functional description	Default	Property
C3-00	Pressure setted(MPa)	0.000~60.000Mpa	0.200Mpa	☆
C3-01	full scale maximum pressure (Mpa)	0.000~60.000Mpa	1.000Mpa	☆
C3-03	Explosion-proof tube protection pressure (Mpa)	0.001~60.000Mpa	1.500Mpa	☆

C3-04	Sleep wakeup pressure (Mpa)	0.0~100%(Corresponding to the set pressure percentage)	80%	☆
C3-07	Sleep frequency	0.00~maximum frequency	20.00HZ	☆
C3-08	The lasting time of frequency is less than sleep pressure	0~250s	10s	☆
C3-09	Sleep selection	0:frequency sleep available 1;pressure selection available	1	☆

Group d0: Motor Parameters

Code	Parameter Name	Functional description	Default	Property
d0-00	Rated motor power	0.1kw~1000.0 kW	Model dependent	★
d0-01	Rated motor voltage	1V~2000 V	Model dependent	★
d0-02	Rated motor current	0.01A~655.35 A (Frequency inverter power ≤55 kW) 0.1A~6553.5 A (Frequency inverter power ≥75 kW)	Model dependent	★
d0-03	Rated motor frequency	0.01 Hz~ maximum frequency	50.00Hz	★
d0-04	Rated motor rotational speed	1rpm~65535rpm	Model dependent	★
d0-05	Stator resistance (asynchronous motor)	0.001 Ω ~65.535 Ω (frequency inverter power≤ 55 kW) 0.0001 Ω ~6.5535 Ω (frequency inverter power ≥75 kW)	Model dependent	★
d0-06	Rotor resistance (asynchronous motor)	0.001 Ω ~65.535 Ω (Frequency inverter power≤ 55 kW) 0.0001 Ω ~6.5535 Ω (Frequency inverter power ≥75 kW)	Model dependent	★
d0-07	Leakage inductive reactance (asynchronous motor)	0.01mH~655.35 mH (Frequency inverter power≤ 55 kW) 0.001mH~65.535 mH (Frequency inverter power ≥75 kW)	Model dependent	★
d0-08	Mutual inductive reactance (asynchronous motor)	0.1mH~6553.5 mH (Frequency inverter power≤ 55 kW) 0.01mH~655.35 mH (Frequency inverter power ≥75 kW)	Model dependent	★
d0-09	No-load current (asynchronous motor)	0.01A ~ d0-02 (Frequency inverter power ≤55 kW) 0.1A to d0-02 (Frequency inverter power ≥75 kW)	Model dependent	★
d0-15	Stator resistance (synchronous motor)	0.001 Ω ~65.535 Ω (Frequency inverter power≤ 55 kW) 0.0001 Ω ~ 6.5535 Ω (Frequency inverter power ≥75 kW)	Model dependent	★
d0-16	Shaft D inductance (synchronous motor)	0.01 mH ~655.35 mH (Frequency inverter power≤ 55 kW) 0.001~65.535 mH (Frequency inverter power ≥75 kW)	Model dependent	★
d0-17	Shaft Q inductance (synchronous motor)	0.01 mH ~655.35 mH (Frequency inverter power≤ 55 kW) 0.001 mH~65.535 mH (Frequency inverter power ≥75 kW)	Model dependent	★
d0-18	Back EMF (synchronous motor)	0.1V~6553.5 V	Model dependent	★
d0-21	Encoder pulses per revolution	1~32767	1024	★
d0-22	Encoder type selection	0: ABZ incremental encoder	0	★
d0-23	Encoder input direction	0: Forward 1: Reverse	0	★

Code	Parameter Name	Functional description	Default	Property
d0-29	Encoder fault detection time	0.0s: No action 0.1s~10.0s	0.0s	★
d0-30	Motor auto-tuning selection	0: No auto-tuning 1: Asynchronous motor static auto-tuning 2: Asynchronous motor dynamic complete auto-tuning 3: Asynchronous motor static complete auto-tuning	0	★

Group d1: Vector Control Parameters

Code	Parameter Name	Functional description	Default	Property
d1-00	Speed/Torque control selection	0: Speed control 1: Torque control	0	★
d1-01	Speed loop proportional gain 1(Kp1)	1~100	30	☆
d1-02	Speed loop integral time 1(Ti1)	0.01s~10.00s	0.50s	☆
d1-03	Switchover frequency 1	0.00HZ ~ d1-06	5.00 Hz	☆
d1-04	Speed loop proportional gain 2(KP2)	1~100	20	☆
d1-05	Speed loop integral time 2(Ti2)	0.01s~10.00s	1.00s	☆
d1-06	Switchover frequency 2	d1-03~ maximum output frequency	10.00 Hz	☆
d1-07	Motor running slip gain	50%~200%	100%	☆
d1-09	Vector control over excitation gain	0~200	64	☆
d1-10	Motor running torque upper limit source in speed control mode	0: d1-11 1: AI1 2: AI2 3: AI3 4: Pulse setting (HDI) 5: Communication setting	0	☆
d1-11	Electric torque limit	0.0%~200.0%	150.0%	☆
d1-14	Excitation current loop proportional gain	1~30000	2000	☆
d1-15	Excitation current loop integral gain	0~30000	1300	☆
d1-16	Torque current loop proportional gain	1~30000	2000	☆
d1-17	Torque current loop integral gain	0~30000	1300	☆
d1-18	Speed loop integral property	0: Integral separation disabled 1: Integral separation enabled	0	☆
d1-21	Maximum output voltage coefficient	100%~110%	105%	☆
d1-22	Max. torque coefficient of field weakening area	50%~200%	100%	☆
d1-24	Torque setting source in torque control	0: Digital setting (d1-26) 1: AI1 2: AI2 3: AI3	0	☆

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		4: Pulse setting (HDI) 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) Full range of values 1~7 corresponds to the digital setting of d1-27.		
d1-26	Torque digital setting in torque control	-200.0%~200.0%	150.0%	☆
d1-28	Forward maximum frequency in torque control	0.00 Hz ~ maximum frequency(b0-13)	50.00 Hz	☆
d1-29	Reverse maximum frequency in torque control	0.00 Hz ~ maximum frequency(b0-13)	50.00 Hz	☆
d1-30	Acceleration time in torque control	0.00s~650.00s	0.00s	☆

Group d2: V/F Control Parameters

Code	Parameter Name	Functional description	Default	Property
d2-00	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 10: V/F complete separation 11: V/F half separation	0	★
d2-01	Torque boost	0.0% (torque auto-boost) 0.1%~30.0%	Model dependent	★
d2-02	Cut-off frequency of torque boost	0.0%~80.0% Actual cut-off frequency= Motor rated frequency*(d2-02)	50.0%	★
d2-03	Multi-point V/F frequency 1 (F1)	0.00 Hz ~ d2-05	0.00 Hz	☆
d2-04	Multi-point V/F voltage 1 (V1)	0.0%~100.0%	0.0%	☆
d2-05	Multi-point V/F frequency 2 (F2)	d2-03 to d2-07	0.00 Hz	☆
d2-06	Multi-point V/F voltage 2 (V2)	0.0%~100.0%	0.0%	☆
d2-07	Multi-point V/F frequency 3 (F3)	d2-05 ~ maximum frequency	0.00 Hz	☆
d2-08	Multi-point V/F voltage 3 (V3)	0.0%~100.0%	0.0%	☆
d2-09	V/F slip compensation coefficient	0.0%~200.0%	0.0%	☆
d2-11	V/F oscillation suppression gain	0~100	40	☆
d2-13	V/F curve setting	0: Digital setting (d2-14) 1: AI1	0	☆

		2: AI2 3: AI3 4: Pulse setting (HDI) 5: Multi-function 6: Simple PLC 7: PID 8: Communication setting (Note: 100.0% corresponds to the rated motor voltage)		
d2-14	Voltage digital setting for V/F separation	0 V ~ rated motor voltage	0 V	☆
d2-15	Voltage rise time of V/F separation	0.0s~1000.0s Note: It indicates the time for the voltage rising from 0 V ~ rated motor voltage.	0.0s	☆

Group d6: Control Optimization Parameters 1

Code	Parameter Name	Functional description	Default	Property
d6-00	Carrier frequency	0.5kHz~16.0 kHz	Model dependent	☆
d6-01	DPWM switchover frequency upper limit	5.00Hz~15.00 Hz	8.00 Hz	★
d6-02	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	★
d6-03	Carrier frequency adjustment with temperature	0: No 1: Yes	1	☆
d6-04	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	1	☆
d6-05	Random PWM depth	0: Random PWM invalid 1~10: Random PWM carrier frequency depth	0	☆
d6-06	Current detected compensation	0~100	0	★
d6-07	SVC mode selection	1: SVC mode 1 2: SVC mode 2	2	☆

Group U0: Standard Monitoring Parameters

Code	Parameter Name	Functional description	Default	Property
U0-00	Running frequency	0.00~300.00 Hz (b0-11 = 2)	-	●
U0-01	Setting frequency	0.00~3000.0 Hz (b0-11 = 1)	-	●
U0-02	DC Bus voltage	0.0~3000.0 V	-	●
U0-03	Output voltage	0V~1140 V	-	●
U0-04	Output current	0.00A~655.35 A (Frequency inverter power ≤ 55 kW) 0.0A~6553.5 A (Frequencyinverter power > 55 kW)	-	●
U0-05	Output power	0~32767	-	●
U0-06	Output torque	-200.0%~200.0%	-	●
U0-07	DI state	-0~32767	-	●
U0-08	DO state	0~1023	-	●
U0-09	AI1 voltage	-	-	●
U0-10	AI2 voltage	-	-	●
U0-11	AI3 voltage	-	-	●

U0-14	Load speed display	0~65535	-	●
U0-15	PID setting	0~65535	-	●
U0-16	PID feedback	0~65535	-	●
U0-17	PLC stage	-	-	●
U0-18	Input pulse frequency	0.00kHz ~100.00 kHz	-	●
U0-19	Feedback speed, unit:0.01Hz	-3000.0Hz~3000.0 Hz -300.00Hz~300.00 Hz	-	●
U0-20	Remaining running time	0.0min~6500.0 min	-	●
U0-21	AI1 voltage before correction	0.00V~10.57 V	-	●
U0-22	AI2 voltage before correction	0.00V~10.57 V	-	●
U0-23	AI3 voltage before correction	-10.57V~10.57 V	-	●
U0-24	Linear speed	0.0min~65535m/min	-	●
U0-26	Present running time	-	-	●
U0-28	Communication setting value	-100.00%~100.00%	-	●
U0-29	Encoder feedback speed	-3000.0Hz~3000.0 Hz -300.00Hz~300.00 Hz	-	●
U0-30	Main frequency X	0.00Hz~300.00 Hz 0.0Hz~3000.0 Hz	-	●
U0-31	Auxiliary frequency Y	0.00Hz~300.00 Hz 0.0Hz~3000.0 Hz	-	●
U0-32	Viewing any register address value	0°C~200°C	-	●
U0-34	Motor temperature	0°C~200°C	-	●
U0-35	Target torque	-200.0%~200.0%	-	●
U0-36	Resolver position	0~4095	-	●
U0-37	Power factor angle	-	-	●
U0-38	ABZ position	0~65535	-	●
U0-39	Target voltage of V/F separation	0 V ~ rated motor voltage	-	●
U0-40	Output voltage of V/F separation	0 V ~ rated motor voltage	-	●
U0-41	DI input state visual display	-	-	●
U0-42	DO output state visual display	-	-	●
U0-43	DI function state visual display 1	-	-	●
U0-44	DO function state visual display 2	-	-	●
U0-45	Fault information	-	-	●
U0-58	Phase Z signal counting	-	-	●
U0-59	Present setting frequency (%)	-100.00%~100.00%	-	●
U0-60	Present running frequency (%)	-100.00%~100.00%	-	●
U0-61	Frequency inverter running	0~65535	-	●

		state			
U0-62	Current fault code	0~99		-	●
U0-63	Sent value of point-point communication	-100.00%~100.00%		-	●
U0-64	Number of slaves	0~63		-	●
U0-65	Torque upper limit	-200.00%~ 200.00%		-	●

Group A0: System Parameters

Code	Parameter Name	Functional description	Default	Property
A0-00	User password	0~65535	0	☆
A0-01	Product number	Frequency inverter product number	Model dependent	●
A0-02	Software version	Software version of control board	Model dependent	●
A0-06	Function parameters selection	00: Not display 01: Display	01	☆
A0-07	Parameter modification property	0: Modifiable 1: Not modifiable	0	☆
A0-09	Restore default settings	0: No operation 1: Restore default settings except motor parameters and accumulation record. 2: Restore default settings include motor parameters 4: Clear records	0	★

Group A2: Control Optimization Parameters 2

Code	Parameter Name	Functional description	Default	Property
A2-00	Current limit level	50%~200%	150%	☆
A2-01	Current limit selection	0~1	1	☆
A2-02	Current limit gain	0~100	20	☆
A2-03	Compensation factor of speed multiplying current limit	50%~200%	50%	☆
A2-04	Voltage limit	200.0V~2000.0V	760V	☆
A2-05	Voltage limit selection	0~1	1	☆
A2-06	Frequency gain for voltage limit	0~100	30	☆
A2-07	Voltage gain for voltage limit	0~100	30	☆
A2-08	Frequency rise threshold during voltage limit	0~50Hz	5Hz	☆
A2-09	Slip compensation time constant	0.1s~10.0s	0.5s	☆
A2-10	Automatic frequency boost enable	0~1	0	☆
A2-11	Min motoring torque current	10%~100%	50%	☆
A2-12	Max regenerative torque current	10%~100%	20%	☆
A2-13	Auto-rise frequency KP	0~100	50	☆
A2-14	Auto-rise frequency KI	0~100	50	☆

A2-15	Torque compensation gain	80~150	100	☆
A2-16	Rotational speed tracking closed loop current KP	0~1000	500	☆
A2-17	Rotational speed tracking closed loop current KI	0~1000	800	☆
A2-18	Rotational speed tracking closed loop current limit	30%~200%	Model dependent	☆
A2-19	Rotational speed tracking closed loop current lower limit	10%~100%	30%	☆
A2-20	Time of rotational speed tracking voltage rise	0.5s~3.0s	1.1s	☆
A2-21	Demagnetization time	0.00s~5.00s	1.0s	☆
A2-22	Braking applied voltage	650V~800V	690V	☆

5. Fault Diagnosis and Solution

5.1 Fault Alarm and Countermeasures

JMS15-SP inverter has 35 types of warning information and protection function. In case of abnormal fault,the protection function will be invoked, the inverter will stop output, and the faulty relay contact of the inverter will start, and the fault code will be displayed on the display panel of the inverter. Before consulting the service department, the user can perform self-check according to the prompts of this chapter,analyze the fault cause and find out t solution. If the fault is caused by the reasons as described in the dotted frame, please consult the agents of inverter or our company directly. Among the 35 types of warning information, Err22 is hardware over current or over voltage signal. In most cases, the hardware over voltage fault will cause Err22 alarm.

Table 7-1 Common faults and solution of the frequency inverter

Fault Code	Err01	Fault Type	Inverter unit protection
1: The output circuit is grounded or short circuited. 2: The connecting cable of the motor is too long. 3: The IGBT overheat. 4: The internal connections become loose. 5: The main control board is faulty. 6: The drive board is faulty. 7: The inverter IGBT 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: Ask for technical support 6: Ask for technical support 7: Ask for technical support
Fault Code	Err02/Err04	Fault Type	Over current during acceleration/ at constant speed
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 frequency inverter 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 a frequency inverter of higher power class.
Fault Code	Err03	Fault Type	Over current during deceleration
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.
Fault Code	Err05/ Err06	Fault Type	Overvoltage during acceleration/deceleration
1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration/deceleration 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/deceleration time. 4: Install the braking unit and braking resistor.
Fault Code	Err07	Fault Type	Overvoltage at constant speed
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.
Fault Code	Err08	Fault Type	Control power supply fault

The input voltage is not within the allowable range.			Adjust the input voltage to the allowable range.
Fault Code	Err09	**Fault Type**	Low voltage
1: Instantaneous power failure occurs on the input power supply. 2: The frequency inverter's input voltage is not within the allowable range. 3: The DC 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: Ask for technical support 4: Ask for technical support 5: Ask for technical support 6: Ask for technical support
Fault Code	Err10	**Fault Type**	Frequency inverter overload
1: The load is too heavy or locked- rotor occurs on the motor. 2: The frequency inverter model is of too small power class.			1: Reduce the load and check the motor and mechanical condition. 2: Select a frequency inverter of higher power class.
Fault Code	Err12	**Fault Type**	Power input phase loss
1: The three-phase power input is abnormal. 2: The drive board is faulty. 3: The lightningproof board is faulty. 4: The main control board is faulty.			1: Eliminate external faults. 2: Ask for technical support. 3: Ask for technical support. 4: Ask for technical support.
Fault Code	Err13	**Fault Type**	Power output phase loss
1: The cable connecting the frequency inverter and the motor is faulty. 2: The frequency inverter's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The IGBT module is faulty.			1: Eliminate external faults. 2: Check whether the motor three phase winding is normal. 3: Ask for technical support. 4: Ask for technical support.
Fault Code	Err14	**Fault Type**	IGBT Module overheat
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 IGBT module is damaged. 5: The inverter IGBT 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.
Fault Code	Err15	**Fault Type**	External equipment fault
1: External fault signal is input via DI. 2: External fault signal is input via virtual I/O.			1: Reset the operation. 2: Reset the operation.
Fault Code	Err16	**Fault Type**	Communication fault
1: The host computer is in abnormal state. 2: The communication cable is faulty. 3: The communication extension card is set improperly. 4: The communication parameters in group bA are set improperly.			1: Check the cabling of host computer. 2: Check the communication cabling. 3: Set the communication extension card correctly. 4: Set the communication parameters properly.
Fault Code	Err18	**Fault Type**	Current detection fault
1: The HALL device is faulty. 2: The drive board is faulty.			1: Replace the faulty HALL device. 2: Replace the faulty drive board.
Fault Code	Err22	**Fault Type**	Frequency inverter hardware fault
1: Overvoltage exists. 2: Over current exists.			1: Handle based on over voltage. 2: Handle based on over current.

Appendix I. Modbus Communication Protocol

JMS15series of inverter provides RS485 communication interface, and adopts MODBUS communication protocol.User can carry out centralized monitoring through PC/PLC to get operating requirements. And user can set the running command, modify or read the function codes, the working state or fault information of frequency inverter by Modbus communication protocol.

I. About Protocol

This serial communication protocol defines the transmission information and use format in the series communication and it includes master-polling (or broadcasting) format, master coding method and the content includes function code of action, transferring data and error checking. The response of slave is the same structure, and it includes action confirmation, returning the data and error checking etc. If slave takes place the error while it is receiving the information or cannot finish the action demanded by master, it will send one fault signal to master as a response.

II. Application Methods

The frequency inverter will be connected into a "Single-master Multi-slave" PC/PLC control net with RS485 bus as the communication slave.

III. Bus Structure

1) Hardware interface.
The "485+" and "485-"terminals on frequency inverter are the communication interfaces of Modbus
2) Topological mode
It is a "Single-master Multi-slave" system. In this network, every communication machine has a unique slave address. One of them is as "master" (usually PC host machine, PLC and HMI, etc.), actively sends out the communication, to read or write the parameters of slave. Other machines will be used as slave and response to the inquiry/command from master. At one time only one machine can send the data and other machines are in the receiving status. The setup range of slave address is 0 to 247. Zero refers to broadcast communication address. The address of slave must is exclusive in the network.
3) Transmission mode
There provide asynchronous series and half-duplex transmission mode. In the series asynchronous communication, the data is sent out frame by frame in the form of message. According to the Modbus-RTU protocol, when the free time of no transmission in communication data lines is more than the transmission time of 3.5byte, it indicates that a new start of communication frame.
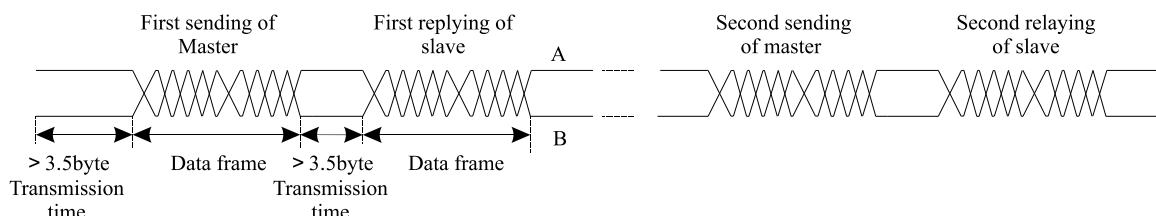

JMS15 series inverter has built-in the Modbus-RTU communication protocol, and is applicable to response the slave "Inquiry/command" or doing the action according to the master's "Inquiry / Command" and response to the data.

Here, master is personnel computer (PC), industrial machine or programmable logical controller (PLC), and the slave is inverter. Master not only visits some slave, but also sends the broadcast information to all the slaves. For

the single master "Inquiry/Command", all of slaves will return a signal that is a response; for the broadcast information provided by master, slave needs not feedback a response to master machine.

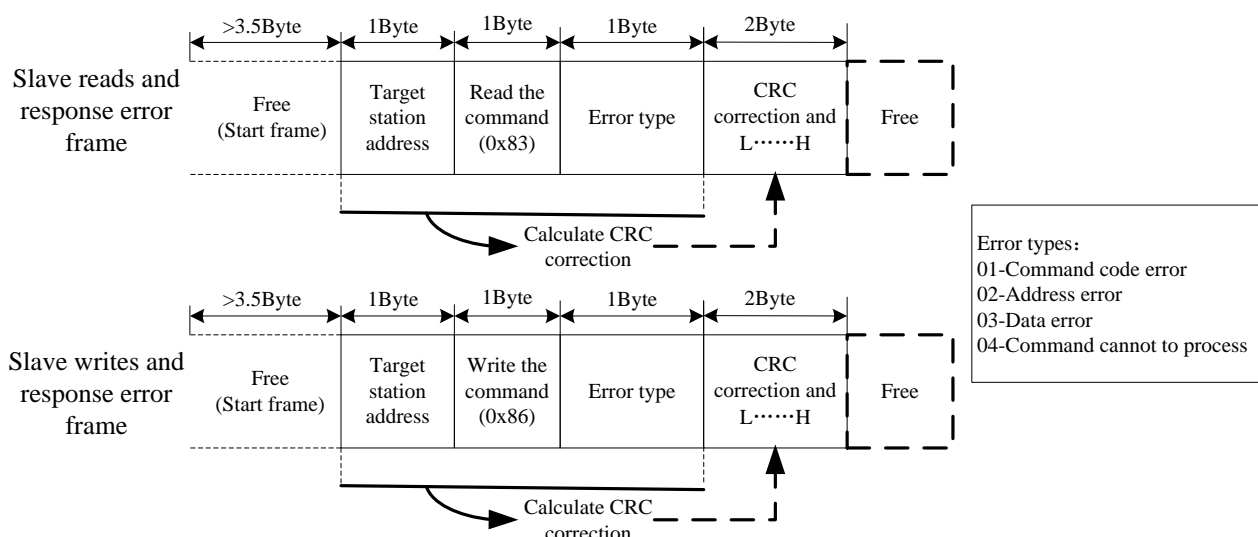**Communication data structure**

Modbus protocol communication data format of JMS15 series inverter is shown as following. The inverter only support the reading and writing of Word type parameters, the corresponding reading operation command is "0x03",the writing operation command is "0x06". The writing and reading operation of byte or bit is not supported.
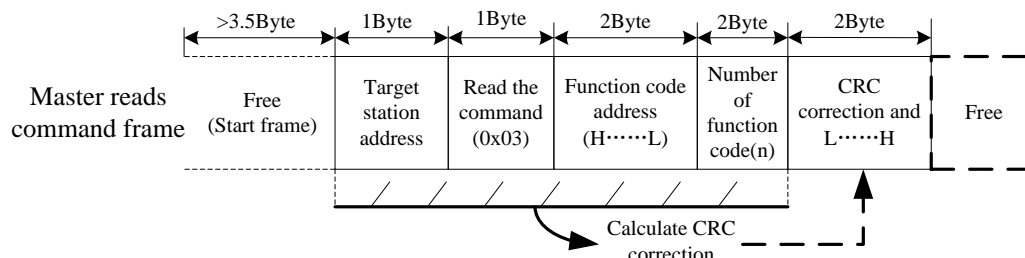
In theory, the host computer can continuously read several function codes once (that is, the maximum value of "n" is 12), but note that not to jump across the last function code in this function group to avoid the wrong reply.
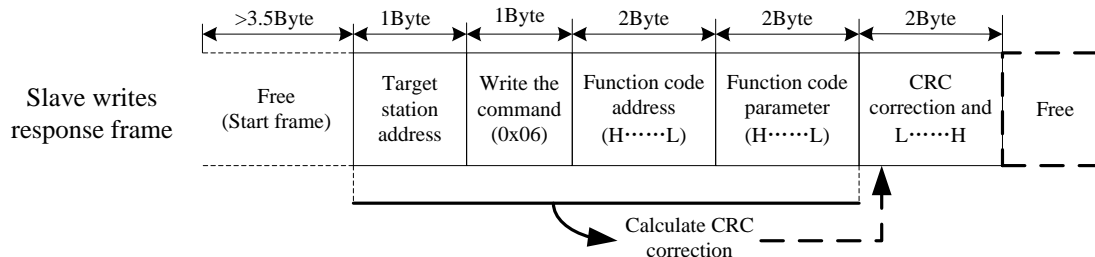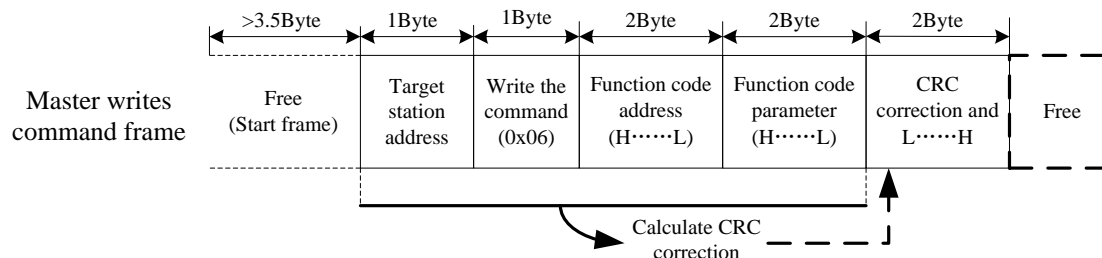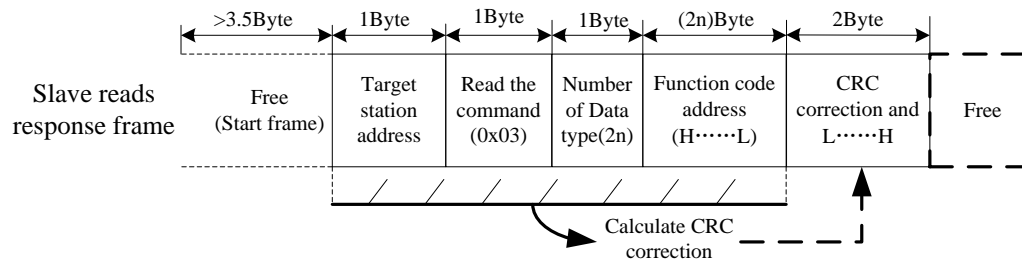
If the wrong communication frame was detected by the salve or other reasons caused the failure of reading and writing, the wrong frame will be replied.

RTU frame format

Frame start (START)	More than the 3.5- character time
Slave address(ADR)	Communication address:1 to 247(0: broadcast address)
Command code(CMD)	03: Read slave parameters 06: Write slave parameters
Function code address(H)	It indicates the external parameter address of frequency inverter in hexadecimal format;
Function code address(L)	There are functional code or non-functional code (such as running state parameter/ running command parameters) type parameters, for details see the address definition. During the transmission, high bit is put in the front, and low bit is at the back.
Number of function code(H)	It indicates the number of function code ready by the frame. If it is "1", then it indicates that it reads one function code. During the transmission, high bit is
Number of function code(L)	put in the front, and low bit is at the back. Only one function code can be modified at one time without the field.
Data(L)	It indicates the replying data or the data waiting to write-in. During the
Data(H)	transmission, high bit is put in the front, and low bit is at the back.
END	3.5- character time

CRC Checking

In RTU mode, messages include an error-checking field that is based on a CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes, containing a16-bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC field.

If the two values are not equal, that means transmission is error

The CRC is started by 0xFFFF.Then a process begins of applying successive eight-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, do not apply to the CRC. During generation of the CRC, each eight-bit character is exclusive ORed with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register is then exclusive ORed with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is exclusive ORed with the register's current value, and the process repeats for eight more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value.

When the CRC is appended to the message, the low-order byte is appended first, followed by the high-order byte.

unsigned int crc_chk_value(unsigned char *data_value,unsigned char length

```
{
    unsigned int crc_value=0xFFFF;
    int i;
    while(length--)
    {
        crc_value^=*data_value++;
        for(i=0;i<8;i++)
        {
            if(crc_value&0x0001)
            {
                crc_value=(crc_value>>1)^0xa001;
            }
            else
            {
                crc_value=crc_value>>1;
            }
        }
    }
    return(crc_value);
}
```

Definition of communication parameter address

Read and write function-code parameters (Some functional code is not changed, only for the manufacturer use.)

The group number and mark of function code is the parameter address for indicating the rules.

High level bytes: F0~FF(Group F), A0~AF(GroupA), 70-7F(Group U)

Low level bytes: 00 ~ FF

For example: F3-12, address indicates to 0xF30C.

Note: Group U: Only for reading parameter, cannot be changed parameters.

Some parameters cannot be changed during operation, some parameters regardless of what kind of state the inverter in, the parameters cannot be changed. Change the function code parameters, pay attention to the scope of the parameters, units, and relative instructions.

Function code group	Communication inquiry address	Inquiry address When Communication modifies RAM
F0~FE	0xF000~ 0xFEFF	0x0000~ 0x0EFF
A0~FC	0xA000~0xACFF	0x4000~0x4CFF
U0	0x7000~ 0x70FF	

Besides, due to EEPROM be frequently stored, it will reduce the lifetime of EEPROM. In the communication mode, and some function codes don't have to be stored as long as change the RAM value.

Stop/start parameter

Parameter address	Parameter description	Parameter address	Parameter description
1000H	Communication set value(-10000 ~ 10000)(Decimal)	1010H	PID setting
1001H	Running frequency	1011H	PID feedback
1002H	DC Bus voltage	1012H	PLC process
1003H	Output voltage	1013H	Pulse input frequency, unit: 0.01KHz
1004H	Output current	1014H	Feedback speed, unit:0.1Hz
1005H	Output power	1015H	Remaining running time

1006H	Output torque	1016H	Voltage before AI1correction
1007H	Running speed	1017H	Voltage before AI2correction
1008H	DI input terminal	1018H	Voltage before AI3correction
1009H	DO output terminal	1019H	Linear speed
100AH	AI1 voltage	101AH	Present power-on time
100BH	AI2 voltage	101BH	Present running time
100CH	AI3 voltage	101CH	Pulse input frequency, unit:1Hz
100DH	Counting value input	101DH	Communication setting value
100EH	Length value input	101EH	Actual feedback speed
100FH	Load speed	101FH	Main frequency X display
		1020H	Auxiliary frequency Y display

Note: Communication setting value is the percentage of relative value, 10000 corresponds to 100%, -10000 correspond to -100.00%.

Control command input frequency inverter: (write in only)

Command word address	Command function
2000H	0001: Forward running
	0002: Reverse running
	0003: Forward jog
	0004: Reverse jog
	0005: Free stop
	0006:Decelarating stop
	0007: Fault reset

Read inverter status: (read only)

Command word address	Command function
3000H	0001: Forward running
	0002: Reverse running
	0003: Stop

Parameter locking password collation: (If the feedback is the 8888H, it indicates the password collation passed)

Password address	Contents of input password
1F00H	*****

Digital output terminal control: (write in only)

Address Of locking password command	Contents of locking password command
2001H	BIT0: DO1 output control BIT1: DO2 output control BIT2: Relay 1 output control BIT3: Relay 2 output control BIT4: FMR output control BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

Analog output AO1 control: (write in only)

Command word address	Command function
2002H	0~7FFF indicates 0%~100%

Analog output AO2 control: (write in only)

Command word address	Command function
2003H	0~7FFF indicates 0%~100%

Pulse output control: (write in only)

Command word address	Command function
2004H	0~7FFF indicates 0%~100%

Inverter fault description:

Inverter fault description	Inverter fault information	
8000H	0000: No fault 0001: Reserved 0002: acceleration over current 0003: deceleration over current 0004: Constant speed over current 0005: acceleration over voltage 0006: deceleration over voltage 0007:Constant speed over voltage 0008: Buffer resistor fault 0009: less voltage fault 000A:Frequency inverter overload 000B: Motor overload 000C: Input phase failure 000D: Output phase failure 000E: IGBT overheat 000F: External equipment fault 0010: Communication fault 0011: Contactor fault 0012: Current detection fault 0013: Motor auto-tuning fault 0014: Encoder/PG fault	0015: EEPROM read-write in fault 0016: Frequency inverter hardware fault 0017: Short circuit to ground fault 0018: Reversed 0019: Reversed 001A: Accumulative running time reached 001B: User-defined fault 1 001C: User-defined fault 2 001D: Accumulative power-on time reached 001E: Off load 001F: PID lost during running 0028: fast current limit fault 0029: Motor switchover fault during running 002A: Too large speed deviation 002B: Motor over-speed 002D: Motor overheat 005A: Encode lines setting fault 005B: Not connect to the encoder 005C: Initial location fault 005E: Speed feedback fault

ModBus communication fault address

Address Definition	Fault information	
8001	0000:Not fault 0001:Password error 0002:Command code error 0003:CRC error 0004:Illegal address	0005:Illegal data 0006:Parameter change invalid 0007:System locked 0008:Inverter busy (EEPROM is storing)

Group bA Communication parameters

bA-00	Communication type selection		Default	0
	Setting Range	0: Modbus protocol		

The now supports Modbus, later will add the communication protocol such as PROFIBUS-DP and CANopen protocol. For details, see the description of "communication protocol".

bA-01	Baud ratio setting		Default	5
	Setting Range	0:300BPS 1:600BPS 2:1200BPS 3:2400BPS	4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS	

This parameter is used to set the data transfer rate from host computer and the frequency inverter. Please note that

baud ratio of the host computer and the inverter should be consistent. Otherwise, the communication is impossible. The higher the baud ratio is, the faster the communication is.

bA-02	Modbus Data format			Default	0
	Setting Range	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>		

The host computer and frequency inverter setup data format must be consistent, otherwise, communication is impossible.

bA-03	Broadcast address	Default	0
	Setting Range	1~249 (0: Broadcast address) Valid for Modbus	

When the local address is set to 0, that is, broadcast address, it can realize the broadcast function of host computer.

bA-04	Modbus response delay	Default	2 ms
	Setting Range	0~20 ms (Only valid for Modbus)	

Response delay time: it refers to the interval time from the inverter finishes receiving data to sending data to the host machine. If the response time is less than the system processing time, then the response delay time is based on the time delay of the system processing time. If the response delay time is more than the system processing time, after the system processes the data, it should be delayed to wait until the response delay time is reached, then sending data back to host machine.

bA-05	Communication timeout	Default	0.0s
	Setting Range	0.0s:invalid 0.1s~60.0s Valid for Modbus	

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

When the function code is set to time value, if the interval time between the communication and the next communication is beyond the communication timeout, the system will report communication failure error (Err16). At normal circumstances, it will be set as invalid. If in the continuous communication system, set this parameter, you can monitor the communication status.

bA-06	Modbus protocol data transmission format selection		Default	1
	Setting Range	Unit's digit: Modbus protocol.		
		0	Non-standard Modbus protocol	
		1	Standard Modbus protocol	

bA-06=1: Select standard Modbus protocol.

bA-06=0: When reading the command, the slave machine return is one byte more than the standard Modbus protocol's, for details, refer to communication data structure of this protocol.

bA-07	Communication reading current resolution		Default	0
	Setting Range	0	0.01A	
		1	0.1A	

It is used to confirm the unit of current value when the communication reads the output current.