



Professional AC Drive Manufacturer

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Professional AC Drive Manufacturer

EC100

AC Drive

Quick Guide_{V1.0}



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1. Preface

Thank you for using the EC100 series vector control AC drive.

Please carefully read this manual before the installation in order to ensure the correct installation and operation of the AC drive, give full play to its superior performance, and ensure safety. Please keep this guide permanently for future maintenance, service and overhaul.

AC drive is a precise electric and electronic product, thus for the safety of the operators and the equipment, please ensure that the installation and parameters adjustment is done by professional motor engineers and the content marked as “Danger”, “Notice”, etc in this manual must be read carefully. If you have any questions, please contact with the agents of our company, and our technicians are ready to serve you.

The instructions are subject to change, without notice.

You can contact us with any product questions through the following ways.



E-mail
overseas@eacon.cc



Official website
www.eaconvfd.com



EACON WeChat
Subscription

⚡ Dangerous and wrong use may cause casualties

⚡ Danger

- The power supply must be turned off when laying the wires.
- When the AC power supply is cut off but the indicator light of the manipulator of AC drive is still on, there is still high voltage in the AC drive which is very dangerous, please do not touch the interior circuit and components.
- Do not check the components and signals on the circuit board during operation.
- The terminal of AC drive must be grounded correctly.
- Do not refit or replace the control board and parts without permission, otherwise, there are risks such as electric shock and explosion.

! Wrong use may cause damage to AC drive or mechanical system

! Notice

- Please do not test the voltage resistance of the interior components of AC drive, as the semi-conductor of AC drive is easy to be punctured and damaged by high voltage.
- Never connect the main circuit output terminals U, V, and W directly to the AC main circuit power supply.
- The circuit board of the AC drive has CMOS IC which is extremely easy to be damaged by static electricity, thus please do not touch the circuit board with your hand before taking anti-static electricity measures.
- Only the qualified motor professionals can install the driver, lay the wire, repair and maintain the AC drive.
- The scrapping of AC drive shall be treated as industrial waste and burning is strictly prohibited.

2. Description of AC drive

2.1 Description of the label of AC drive

MODEL: EC101D5G43A

①

MODEL: **EC101D5G43A**

②

INPUT: 3PH 380V 50Hz

③

OUTPUT: 3PH 0-380V 0.1-500Hz
G: 1.5kW 3.8A 150%/1min

④



⑤

11D54A6040001

⑥

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①

AC drive Model

②

Input power Spec.

③

Output power Spec.

④

Barcode

⑤

Serial number of production control

⑥

Software version

2.2 Description of Model

EC

1

01D5G

43

A

Structure version

Voltage : 21 represents single-phase 220V
23 represents three-phase 220V
43 represents three-phase 380V

Capacity specification of AC drive
01D5G represents 1.5kW constant torque

Serial number: EC100

Abbreviation of "EACON"

2.3 Description of Serial number

P/N

1

1D5

4

A

S/N

604

0001

Sequence number

Years

Structure version

Voltage class

G power range

Series number

2.4 Product standard specification

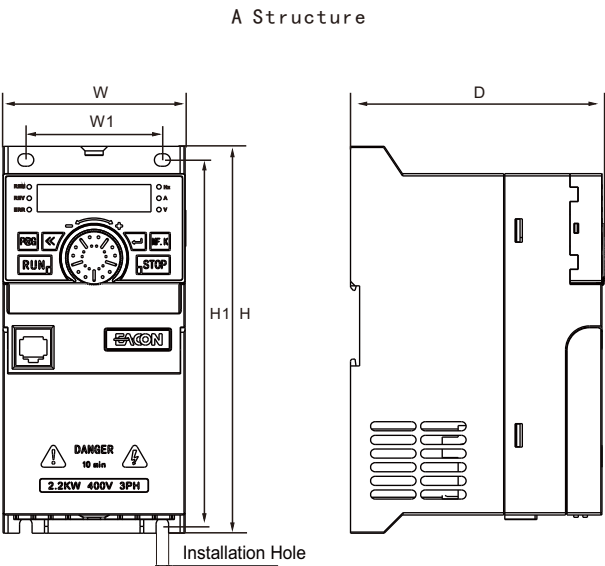
Single-phase 220V	
Power (kW)	Rated output current (A)
0.75	3.8
1.5	7.0
Three-phase 220V	
Power (kW)	Rated output current (A)
0.75	3.8
1.5	7.0
2.2	9.0
Three-phase 380V	
Power (kW)	Rated output current (A)
0.75	2.1
1.5	3.8
2.2	5.1
3.0	7.1
4.0	9.0
5.5	12.6
7.5	16.1
11	25

3. Technical Specifications

Item		Specifications
Standard functions	Maximum frequency	0.00~500.00Hz
	Carrier frequency	1~16 kHz The carrier frequency is automatically adjusted based on the load features.
	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.025%
	Control mode	Sensorless vector control (SVC) Voltage/Frequency (V/F) control
	Startup torque	G type: 0.5 Hz/150% (SVC)
	Speed range	1:100 (SVC)
	Speed stability accuracy	±0.5% (SVC)
	Overload capacity	G type: 60s for 150% of the rated current, 3s for 180% of the rated current
	Torque boost	Customized boost 0.1%~30.0%
	V/F curve	- Straight-line V/F curve - Multi-point V/F curve - N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)
	V/F separation	Two types: complete separation; half separation
	Ramp mode	- Straight-line ramp - S-curve ramp Four groups of acceleration/deceleration time with the range of 0.0~6500.0s
	DC braking	DC braking frequency: 0.00 Hz to maximum frequency Braking time: 0.0~600.0s Braking action current value: 0.0%~150.0%
	JOG control	JOG frequency range: 0.00~maximum frequency JOG acceleration/deceleration time: 0.0~6500.0s
	Onboard multiple preset speeds	It implements up to 8 speeds via the simple PLC function or combination of S terminal states.
	Onboard PID	It realizes process-controlled closed loop control system easily.
Protection mode	Auto voltage regulation (AVR)	It can keep constant output voltage automatically when the mains voltage changes.
	Overvoltage/Overcurrent stall control	The current and voltage are limited automatically during the running process so as to avoid frequent tripping due to overvoltage/overcurrent.
	High-speed current limiting function	Minimize over-current fault and protect normal operation of AC drive.

Item		Specifications
Individualized functions	High performance	Control of asynchronous motor and synchronous motor are implemented through the high-performance current vector control technology.
	Rapid current limit	It helps to avoid frequent overcurrent faults of the AC drive.
	Multiple communication protocols	It supports modbus.
RUN	Running command source	- Operation panel - Control terminals - Serial communication port You can perform switchover between these sources in various ways.
	Frequency source	There are a total of 7 frequency sources, such as digital setting, analog voltage setting, analog current setting, pulse setting and serial communication port setting. You can perform switchover between these sources in various ways.
	Auxiliary frequency source	There are ten auxiliary frequency sources. It can implement fine tuning of auxiliary frequency and frequency synthesis.
	Input terminal	Standard: 5 digital input terminals 2 analog input terminals, two of which only supports 0~10 V voltage input and the other supports 0~10 V voltage input or 0~20 mA current input
	Output terminal	Standard 1 relay output terminal
	Protection mode	Motor short-circuit detection at power-on, input/output phase loss protection, overcurrent protection, over-voltage protection, undervoltage protection, overheat protection and overload protection
	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt.
	Altitude	Lower than 1000m
	Ambient temperature	-10° C to +40° C (de-rated if the ambient temperature is between 40° C and 50° C)
	Humidity	Less than 95%RH, without condensing
Environment	Vibration	Less than 5.9m/s (0.6g)
	Storage temperature	-20°C ~+60°C
	IP level	IP20
	Pollution degree	PD2

4. Mechanical dimension of AC drive



Single-phase 220V

Structure	Power (kW)	W (mm)	W1	H	H1	D	Installation Hole
A Structure	0.75kW	80	60	170	160	112	φ5.5
	1.5kW						

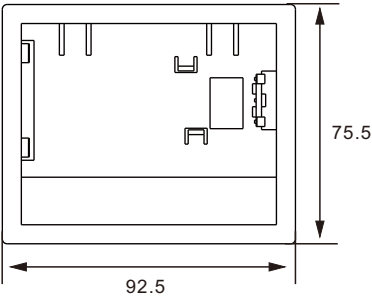
Three-phase 220V

Structure	Power (kW)	W (mm)	W1	H	H1	D	Installation Hole
A Structure	0.75kW	80	60	170	160	112	φ5.5
	1.5kW						
	2.2kW						

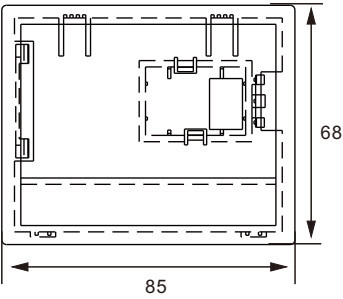
Three-phase 380V

Structure	Power (kW)	W (mm)	W1	H	H1	D	Installation Hole
A Structure	0.75kW	80	60	170	160	112	φ5.5
	1.5kW						
	2.2kW						

Dimensions of keypad operation pull-out frame & sheet metal cutout:



Pull-out keypad dimensions:
92.5mm*75.5mm



Sheet metal mounting hole size:
85mm*68mm

5. Main Circuit Connection Functions

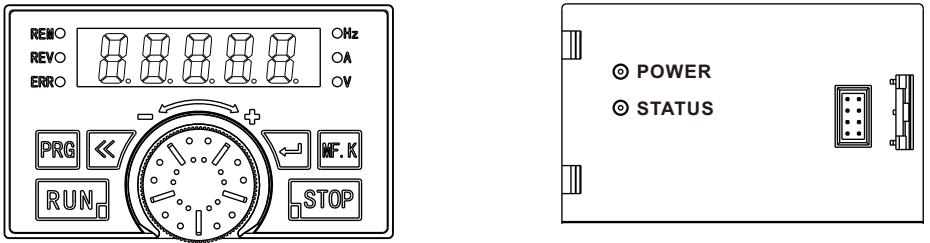
Terminal	Type	Function Description
R/S/T	Main circuit power supply input	Input end of commercial power supply
U/V/W	AC drive output terminal	AC drive output connected with 3-phase induction motor.
PB P	External braking resistorconnection	The unit is internally equipped with a braking unit connected to terminals PB and P. An external braking resistor must be connected to increase braking torque.
⊕	Grounding terminal	For safety and small noise, AC drive's ground terminal EG should be well grounded.

6. AC drive control terminal connections

Type	Terminal	Name	Function Description
Power supply	10V-GND	External+10V power supply	Provide +10V power supply for external unit, maximum output current: 10mA Generally, it provides power supply to external potentiometer with resistance range of 1kΩ.~5kΩ.
Analog input	AI1-GND	Analog input terminal 1	1. Input voltage range: DC 0V~10V 2. Impedance: 22kΩ
	AI2-GND	Analog input terminal 2	1. Input range: DC 0V~10V/4mA~20mA, decided by selection of P5-00. 2. Impedance: 22kΩ (voltage input), 500Ω (current input)
Digital input	S1-COM	Digital input 1	1. Optocoupler coupling isolation, compatible with dual polarity input 2. Impedance: 2.4kΩ 3. Voltage range for level input: 9V~30V
	S2-COM	Digital input 2	
	S3-COM	Digital input 3	
	S4-COM	Digital input 4	
	S5-COM	Digital input 5	
Analog output	A01-GND	Analog output terminal 1	Voltage or current output is decided by P5-12 Output voltage range: 0V~10V Output current range: 0mA~20mA
Digital output	Y1A/Y1B/Y1C	Relay digital output 1	Contact driving capacity: 250Vac, 3A, COSφ=0.4. 30Vdc, 1A

7. Operation and display

7.1 operation panel



7.2 Description of the operation panel indicators

Indicator	Description	Indicator	Description
REM	Control mode set by the source of P0-02	REV	Motor reverse rotation
ERR	AC drive has failure	Hz	Monitoring interface is frequency
A	Monitoring interface is current	V	Monitoring interface is voltage

7.3 Instruction for local LED indicators

Name	Function Description
Power indicator light	Red light: power on
Status indicator light	Light off: stop status
	Red light: running
	Red light flashing: fault status

7.4 Description of Keys on the LED operation panel

Key	Name	Function Description
RUN	Running key	In the keyboard operation mode, it is used to run the operation.
STOP	Stop/Reset	In the running state, press this key to stop; In the fault alarm state, press this key to reset; Its characteristics are constrained by function P7-02.
PRG	Programming key	Level 1 main menu entry or exit.
⏪	Shift key	Move the position on the display screen.
↩	Confirm key	Enter the menu interface step by step; Set parameters.
MF.K	Multi functional key	Select function switching according to P7-09, which can be defined as source, or fast direction switching.
⌚	Potentiometer	Increase and decrease of figures.

8. Faults and solutions

Display	Fault name	Possible causes	Solutions
Err01	Inverter unit protection	1: The output circuit is grounded or short circuited. 2: The power cable between the motor and the AC drive is too long. 3: The power module is overheated. 4: The internal connections become loose. 5: The main control board is faulty. 6: The drive board is faulty. 7: The inverter module is faulty.	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filter and the cooling fan. 4: Connect all cables properly. 5: Seek technical support. 6: Seek technical support. 7: Seek technical support.
Err02	Overcurrent during acceleration	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 input voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto-tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to the normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.
Err03	Overcurrent 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 input 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 autotuning. 3: Increase the deceleration time. 4: Adjust the voltage to the normal range. 5: Remove the added load. 6: Install the braking unit and braking resistor.
Err04	Overcurrent at constant speed	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The input voltage is too low. 4: A sudden load is added during operation. 5: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor autotuning. 3: Adjust the voltage to the normal range. 4: Remove the added load. 5: Select an AC drive of higher power class.

Err05	Overvoltage during acceleration	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Remove the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.
Err06	Overvoltage during deceleration	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Remove the external force or install a braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor.
Err07	Overvoltage at constant speed	1: The input voltage is too high. 2: An external force drives the motor during running.	1: Adjust the voltage to the normal range. 2: Remove the external force or install the braking resistor.
Err08	Control power supply fault	1: The input voltage is not within the allowable range.	1: Adjust the input voltage to the allowable range.
Err09	Undervoltage	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The 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 the normal range. 3: Contact technical support. 4: Contact technical support. 5: Contact technical support. 6: Contact technical support.
Err10	AC drive overload	1: The load is too heavy or locked rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Err11	Motor overload	1: P9-23 is set improperly. 2: The load is too heavy or locked rotor occurs on the motor. 3: The AC drive model is of too small power class.	1: Set it correctly. 2: Reduce the load and check the motor and the mechanical condition. 3: Select an AC drive of higher power class.
Err12	Power input phase loss	1: The three-phase power input is abnormal. 2: The drive board is faulty. 3: The lightning board is faulty. 4: The main control board is faulty.	1: Eliminate external faults. 2: Seek technical support. 3: Seek technical support. 4: Seek technical support.
Err13	Power output phase loss	1: The cable connecting the AC drive and the motor is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor three-phase winding is normal. 3: Seek technical support. 4: Seek technical support.

Err14	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 module is damaged. 5: The inverter module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the inverter module.
Err15	External equipment fault	1: External fault signal is input via S.	1: Reset the operation.
Err16	Communication fault	1: The host computer is in abnormal state. 2: The communication cable is faulty. 3: The communication parameters in group PB are set improperly.	1: Check the cabling of host computer. 2: Check the communication cabling. 3: Set the communication parameters properly.
Err17	Contactor fault	1: The drive board and power supply are faulty. 2: The contactor is faulty.	1: Replace the faulty drive board or power supply board. 2: Replace the faulty contactor.
Err18	Current detection fault	1: The HALL device is faulty. 2: The drive board is faulty.	1: Seek technical support. 2: Seek technical support.
Err19	Motor auto-tuning fault	1: The motor parameters are not set according to the nameplate. 2: The motor auto-tuning times out.	1: Set the motor parameters according to the nameplate properly. 2: Check the cable connecting the AC drive and the motor.
Err21	EEPROM readwrite fault	1: The EEPROM chip is damaged.	1: Replace the main control panel.
Err22	AC drive hardware fault	1: Overvoltage exists. 2: Overcurrent exists.	1: Handle based on over-voltage. 2: Handle based on over-current.
Err23	Short circuit to ground	1: The motor is short circuited to the ground.	1: Replace the cable or motor.
Err24	EEPROM Initialization fault	1: Abnormal user data.	1: Reinitialize data and set parameters.
Err26	Running time reached	1: Accumulative running time reaches setting.	1: Clear the record through the parameter initialization function.
Err27	User-defined fault 1	1: The user-defined fault 1 signal is input via S.	1: Reset the operation.
Err28	User-defined fault 2		
Err29	Power-on time reached	1: Accumulative power-on time reaches the setting.	1: Clear the record through the parameter initialization function.
Err30	Load becoming 0	1: The AC drive running current is lower than P9-38.	1: Check the load is disconnected or P9-38 and P9-39 is correct.

Err31	PID feedback lost during running	1: The PID feedback is lower than the setting of PA-27.	1: Check the PID feedback signal or set PA-27 to a proper value.
Err40	Pulse-by-pulse current limit fault	1: The load is too heavy or locked rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select the AC drive of higher power class.
Err42	Too large speed deviation	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: P9-42 and P9-43 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor autotuning. 3: Set F9-69 and F9-70 correctly based on the actual situation.
Err43	Motor over-speed	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: P9-40 and P9-41 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor auto-tuning. 3: Set P9-40 and P9-41 correctly based on the actual situation.

9. Function Code Table

P0 Standard Parameter group				
Function Code	Parameter Name	Setting Range	Default	Address
P0-00	—	—	—	0000H
P0-01	Motor control mode	0: V/F control 1: Sensorless flux vector control (SVC)	0	0001H
P0-02	Command source selection	0: Operation panel control 1: Terminal control 2: RS485 Communication control 3: Reserved 4: Terminal switchover	0	0002H
P0-03	Main frequency source X selection	0: Operation panel digital setting frequency 1: AI1 2: AI2 3: Reserved 4: Reserved 5: RS485 communication setting 6: UP/DW setting 7: PID control setting 8: PLC mode operation setting	0	0003H
P0-04	Main source X Gain	0.000~5.000	1.000	0004H
P0-05	Auxiliary frequency source Y selection	Same as P0-03	0	0005H
P0-06	Auxiliary source Y Gain	0.000~5.000	1.000	0006H
P0-07	Main and Auxiliary frequency source combination mode	0: Main frequency source X is valid 1: Auxiliary frequency source Y is valid 2: X+Y 3: X-Y 4: MAX (X , Y) 5: MIN (X , Y) 6: X*Y/maximum frequency 7: Any non-zero value of the main frequency source X and auxiliary frequency source Y is valid, and the primary channel takes precedence.	0	0007H
P0-08	Digital setting of main source X frequency	0.00~Maximum output frequency	50.00Hz	0008H
P0-09	Digital setting of auxiliary source Y frequency	0.00~Maximum output frequency	50.00Hz	0009H
P0-10	Maximum output frequency	0.00~500.00Hz	50.00Hz	000AH

P0-11	Source of frequency upper limit selection	0: Set by P0-12 1: AI1 2: AI2 3: Reserved 4: Reserved 5: RS485 Communication setting	0	000BH
P0-12	Source of frequency upper limit digital setting	P0-13~100.0%	100.0%	000CH
P0-13	Source of frequency lower limit digital setting	0~P0-12	0.0%	000DH
P0-14	Frequency lower limit run mode	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	1	000EH
P0-15	Acceleration time 1	0.1~6500.0s	Model dependent	000FH
P0-16	Deceleration time 1	0.1~6500.0s	Model dependent	0010H
P0-17	Acceleration/Deceleration time unit	1: 0.1s 2: 0.01s	1	0011H
P0-18	Stopping method	0: Ramp to stop 1: Coast to stop	0	0012H
P0-19	Rotation direction selection	BIT0: 0: Forward direction operation 1: Reverse direction operation BIT1: 0: Reverse operation enable 1: Reverse operation disable	00	0013H
P0-20	Carrier frequency	1.0~15.0kHz	Model dependent	0014H
P0-21	Parameter initialization	0: No operation 1: Data locked 2: Reset Error message 3~6: Undefined 7: Initialization setting—User data reset 10: Back up current user parameters 210: Restore user backup parameters	0	0015H
P1 Motor parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P1-00	Parameter Self-tuning Selection	0: No auto-tuning 1: Asynchronous motor stationary auto-tuning 2: Asynchronous motor (rotational)complete auto-tuning 3: Asynchronous motor stationary auto-tuning 2	0	0100H

P1-01	Motor type	0: Common asynchronous motor	0	0101H
P1-02	Motor rated power	0.1kW~1000.0kW	Model dependent	0102H
P1-03	Motor rated voltage	1V~2000V	Model dependent	0103H
P1-04	Motor rated current	0.01A~655.35A (AC Drive power ≤ 5kW) 0.1A~6553.5A (AC Drive power >55kW)	Model dependent	0104H
P1-05	Motor rated frequency	0.01Hz~maximum frequency	Model dependent	0105H
P1-06	Motor rated rotational speed	1rpm~65535rpm	Model dependent	0106H
P1-07	Stator resistance (asynchronous motor)	0.001 Ω ~ 65.535 Ω (AC Drive power ≤ 55kW)	Model dependent	0107H
P1-08	Rotor resistance (asynchronous motor)	0.0001 Ω ~ 6.5535 Ω (AC Drive power >55kW)	Model dependent	0108H
P1-09	Leakage inductive reactance (asynchronous motor)	0.01mH ~ 655.35mH (AC Drive power ≤ 55kW)	Model dependent	0109H
P1-10	Mutual inductive reactance (asynchronous motor)	0.001mH ~ 65.535mH (AC Drive power >55kW)	Model dependent	010AH
P1-11	No-load current (asynchronous motor)	0.01A ~ 655.35A (AC Drive power ≤ 55kW) 0.1A ~ 6553.5A (AC Drive power >55kW)	Model dependent	010BH
P1-12 ~ P1-16	Reserved	—	—	010CH ~ 0110H
P1-17	Stator resistance of synchronous motor	0.001 to 655.35 Ω (AC drive power ≤ 55 kW) 0.0001 to 65.535 Ω (AC drive power > 55 kW)	Tuning parameter	0111H
P1-18	D-axis inductance of synchronous motor	0.01 to 655.35 mH (AC drive power ≤ 55 kW) 0.001 to 65.535 mH (AC drive power > 55 kW)	Tuning parameter	0112H
P1-19	Q-axis inductance of synchronous motor	0.01 to 655.35 mH (AC drive power ≤ 55 kW) 0.001 to 65.535 mH (AC drive power > 55 kW)	Tuning parameter	0113H
P1-20	Reserved	—	—	0114H
P1-21	Reserved	—	—	0115H

P2 Vector Control Parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P2-00	Vector control mode	BIT0: SVC optimization mode selection 1: Optimization mode 1 2: Optimization mode 2 BIT1: Reserved BIT2: Reserved BIT3: Reserved	0002	0200H
P2-01	Speed loop proportional gain 1	1~100	30	0201H
P2-02	Speed loop integral time 1	0.01~10.00s	0.50s	0202H
P2-03	Switchover frequency 1	0.00~P2-06	5.00Hz	0203H
P2-04	Speed loop proportional gain 2	1~100	20	0204H
P2-05	Speed loop integral time 2	0.01~10.00s	1.00s	0205H
P2-06	Switchover frequency 2	P2-03~maximum frequency	10.00Hz	0206H
P2-07	Slip compensation factor	50~200%	100%	0207H
P2-08	Time constant of speed loop filter	0.001~1.000s	0.050s	0208H
P2-09	Vector control over-excitation gain	0~200	64	0209H
P2-10	Speed control positive torque limit	0: P2-11 function code setting 1: AI1 2: AI2 3: Reserved 4: Pulse setting (S5) 5: Communication setting 6: MIN(AI1, AI2) 7: MAX(AI1, AI2)	0	020AH
P2-11	Positive torque limit setting	0.0~200.0%	150.0%	020BH
P2-12	Speed control negative torque limit	0: P2-11 function code setting 1: AI1 2: AI2 3: Reserved 4: Pulse setting (S5) 5: Communication setting 6: MIN(AI1, AI2) 7: MAX(AI1, AI2)	0	020CH

P2-13	Negative torque limit digital setting	0.0%~200.0%	150.0%	020DH
P2-14	Current loop of M-axis Kp	0~60000	2000	020EH
P2-15	Current loop of M-axis Ki		1300	020FH
P2-16	Current loop of T-axis Kp		2000	0210H
P2-17	Current loop of T-axis Ki		1300	0211H
P2-18	Speed loop integral property	0: Invalid 1: Valid	0	0212H
P2-19	Over excitation mode selection	0: Disable 1: Reduce process enable 2: Constant speed and deceleration	1	0213H
P2-20	Over modulation enable selection	0~1	0	0214H
P2-21	Maximum output voltage coefficient	100~110%	105%	0215H
P2-22	Field weakening automatic adjustment gain	50~200%	100%	0216H
P2-23	Negative torque limit enable	0~1	0	0217H
P3 V/F Control Parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P3-00	V/F curve selection	0: Linear V/F 1: Set P0-03 ~ P3-06 parameter to obtain any V/F relationship curve 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved	0	0300H

P3-00	V/F curve selection	10: V/F complete separation 11: V/F half separation	0	0300H
P3-01	Preset frequency (F1)	0.00~P3-03	1.00Hz	0301H
P3-02	Preset voltage (V1)	0.0~P3-04	3.0%	0302H
P3-03	Preset frequency (F2)	P3-01~P3-05	25.00Hz	0303H
P3-04	Preset voltage (V2)	P3-02~P3-06	50.0%	0304H
P3-05	Preset frequency (F3)	P3-03~maximum frequency	50.00Hz	0305H
P3-06	Preset voltage (V3)	P3-04~100%	100%	0306H
P3-07	V/F Torque boost	0.1~30.0%	Model dependent	0307H
P3-08	Cut-off frequency of torque boost	0.00~maximum frequency	50.00Hz	0308H
P3-09	Online torque compensation gain	80~150%	100%	0309H
P3-10	V/F slip compensation	0~200.0%	0.0%	030AH
P3-11	Slip compensation time constant	0.1~10.0s	0.5s	030BH
P3-12	Over excitation gain	0~2.00	0.64	030CH
P3-13	V/F oscillation suppression gain	0~1000	Model dependent	030DH
P3-14	Oscillation suppression mode selection	0~4	3	030EH
P3-15	Voltage source for V/F separation selection	0: Digital setting (P3-15) 1: AI1 2: AI2 3: Reserved 5: Multi-reference 4: Pulse setting (S5) 7: PID 6: Simple PLC 8: Communication setting	0	030FH
P3-16	Voltage digital setting for V/F separation	0V~rated motor voltage	0V	0310H

P3-17	Voltage acceleration time of V/F separation	0.1~1000.0s	10.0s	0311H
P3-18	Voltage deceleration time of V/F separation	0.1~1000.0s	10.0s	0312H
P3-19	V/F separation shutdown mode	0: Frequency/voltage independent reduction to 0. 1: After the voltage is reduced to 0, the frequency is reduced to 0 again.	0	0313H
P3-20	Overcurrent stall action current	50~200%	150%	0314H
P3-21	Overcurrent stall suppression enable	0:Invalid 1:Valid	1	0315H
P3-22	Overcurrent stall suppression gain	0~100	20	0316H
P3-23	Stall current compensation factor	50~200%	50%	0317H
P3-24	Overvoltage stall action voltage	200.0V~2000.0V	760.0V	0318H
P3-25	Overvoltage stall enable	0:Invalid 1:Valid	1	0319H
P3-26	Overvoltage stall frequency gain	0~100	30	031AH
P3-27	Overvoltage stall voltage gain	0~100	30	031BH
P3-28	Overvoltage stall maximum frequency	0~50Hz	5Hz	031CH
P4 Input Terminals function				
Function Code	Parameter Name	Setting Range	Default	Address
P4-00	S1 terminal function	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three-Wire control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Coast to stop 7: Emergency stop	1	0400H

P4-01	S2 terminal function	8: Fault reset (RESET) 9: External fault input 10: Terminal UP 11: Terminal YWN 12: UP and YWN setting clear 13: Speed control/Torque control switchover 14: Speed search start enable 15: Reserved 16: Multi-reference terminal 1 17: Multi-reference terminal 2 18: Multi-reference terminal 3 19: Multi-reference terminal 4	2	0401H
P4-02	S3 terminal function	20: Terminal 1 for acceleration/deceleration time selection 21: Terminal 2 for acceleration/deceleration time selection 22: Acceleration/Deceleration prohibited 23: PID control cancel 24: PID control pause 25: PID integral pause 26: PID characteristic switching 27: PID parameter switchover 28: PID target value switchover terminal 1 29: PID target value switchover terminal 2 30: PID target value switchover terminal 3 31: PID feedback value switchover terminal 1 32: PID feedback value switchover terminal 2 33: PID feedback value switchover terminal 3 34: PLC pause 35: PLC status reset 36: Swing enable 37: Swing pause 38: Swing reset 39: Frequency source switchover terminal 1 40: Frequency source switchover terminal 2 41: Frequency source switchover terminal 3 42: Frequency source switchover terminal 4 43: Command source switchover terminal 1 44: Command source switchover terminal 2 45: Counter input terminal 46: Counter reset terminal 47: Counter clock input terminal 48: Counter reset 49: DC braking command 50: Terminal pre-excitation 51: User-defined fault1 52: User-defined fault2 53: Pump 1 invalid 54: Pump 2 invalid 55: Pump 3 invalid 56: Pump 4 invalid	4	0402H
P4-03	S4 terminal function		5	0403H
P4-04	S5 terminal function		6	0404H
P4-05	Characteristic selection of terminal S1-S4	BIT0: S1 terminal 0: Effective closing 1: Effective opening BIT1: S2 terminal 0: Effective closing 1: Effective opening BIT2: S3 terminal 0: Effective closing 1: Effective opening BITE: S4 terminal 0: Effective closing 1: Effective opening	0000	0405H

P4-06	Filter time of terminal S1-S4	0.00~60.00s	0.10s	0406H
P4-07	Characteristic selection of terminal S5-S8	BIT0: S5 terminal 0: Effective closing 1: Effective opening BIT1: Reserved BIT2: Reserved BIT3: Reserved	0000	0407H
P4-08	Filter time of terminal S5	0.00~60.00s	0.10s	0408H
P4-09	Terminal command mode	0: Two-line mode 1 Terminal set as 1 is forward running, terminal set as 2 is reverse running 1: Two-line mode 2 Terminal set as 1 is start running, terminal set as 2 is switch forward and reverse running 2: Three-line mode 1 Terminal set as 1 is forward running, terminal set as 2 is reverse running, terminal set as 3 is stop running 3: Three-line mode 2 Terminal set to 1 is start running, terminal set as 2 is switch forward and reverse, terminal set as 3 is Stop running	0	0409H
P4-10	Terminal action mode selection	BIT0: Terminal of coast to stop recovery mode 0: Restore the original instruction after invalidation 1: Do not restore the original instruction after invalidation BIT1: Terminal of emergency stop recovery mode 0: Restore the original instruction after invalidation 1: Do not restore the original instruction after invalidation BIT2: Select the terminal operation mode after fault reset 0: The terminal operation command is valid immediately 1: The terminal operation command is valid only after it is canceled	111	040AH
P4-11	Reserved	-	-	040BH
P4-12	Reserved	-	-	040CH
P4-13	Terminal protection function selection	BIT0: 0: Invalid terminal operation command when power on 1: Valid terminal operation command when power on BIT1: When the run command setting channel terminal switching, selection of run command is valid	00	040DH

P4-13	Terminal protection function selection	0: The running command is valid after stopping during switching 1: The run command is valid immediately when switching	00	040DH
P4-14	UP/DW frequency value	0.0~100.0%	0.1%	040EH
P4-15	UP /DW frequency adjustment selection	0: Retentive at power failure 1: Non-retentive at power failure 2: Valid operation, stop and reset	0	041FH
P4-16	Speed of UP/DW frequency increase and decrease	0.1~100.0%/s	2.0%/s	0410H
P4-17	Y1 terminal function	0: No output 1: Forward running 2: Reverse running 3: Fault output1 (no output at auto-reset period) 4: Fault output2 (output at auto-reset period) 5: Ready for RUN 6: Frequency reached 7: Frequency-level detection FDT1 output 8: Frequency-level detection FDT2 output 9: Frequency upper limit reached 10: Frequency lower limit reached 11: Current 1 reached 12: Current 2 reached 13: Zero current output 14: Output current out of limit 15: Torque limited 16: OL1 motor overload pre-warning 17: OL2 AC drive overload pre-warning 18: Zero-speed running (no output at stop) 19: Acceleration running 20: Deceleration running 21: Dc breaking 22: PLC step completed 23: PLC cycle completed 24: Reserved	3	0411H
P4-18	Extended Y2 function	25: Accumulative running time reached 26: Timing reached 27: Maximum count value reached 28: Set count value reached 29: AII input out of limit 30: Module temperature Reached 31: Fan running 32: Data output 1 from transfer(Y function) 33: Data output 2 from transfer(Y function) 34: Data output 3 from transfer(Y function) 35: Data output 4 from transfer(Y function) 36: Pump 1 start-up 37: Pump 2 start-up 38: Pump 3 start-up 39: Pump 4 start-up	2	0412H
P4-19	Extended Y3 function		0	0413H

P5 Analog terminal parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P5-00	Analog input signal selection	BIT0: AI2 signal selection 0: 0~10V 1: 0~20.00mA BIT1: Reserved BIT2: Reserved BIT3: Reserved	0	0500H
P5-01	AI1 lower limit value	0.00~10.00V	0.00V	0501H
P5-02	AI1 lower limit corresponding setting	0.00~100.00%	0.00%	0502H
P5-03	AI1 upper limit value	0.00~10.00V	9.90V	0503H
P5-04	AI1 upper limit corresponding setting	0.00~100.00%	100.00%	0504H
P5-05	AI1 filter time	0.00~10.00s	0.10s	0505H
P5-06	AI2 lower limit value	0.00~10.00V	0.00V	0506H
P5-07	AI2 lower limit corresponding setting	0.00~100.00%	0.00%	0507H
P5-08	AI2 upper limit value	0.00~10.00V	9.90V	0508H
P5-09	AI2 upper limit corresponding setting	0.00~100.00%	100.00%	0509H
P5-10	AI2 filter time	0.00~10.00s	0.10s	050AH
P5-11	A02 output selection	0: Set frequency 1: Output frequency 2: Output current 3: Output voltage 4: Mechanical speed 5: Set torque 6: Output torque 7: PID setting 8: PID feedback 9: Output power 10: Bus voltage 11: Input voltage 12: AI1 input value 13: AI2 input value 14: Reserved 15: Reserved 16: Module temperature 17: Internal temperature 18: Excitation quantity 19: RS485 communication settings	0	050BH

P5-12	Analog output signal selection	BIT0: A01 signal selection 0: 0~10V 1: 4.00~20.00mA 2: 0.00~20.00mA BIT1: Reserved BIT2: Reserved BIT3: Reserved	0000	050CH
P5-13	A01 output gain	25.0~200.0%	102.0%	050DH
P5-14	A01 output offset coefficient	-10.0~10.0%	0.0%	050EH
P6 Start/Stop Control parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P6-00	Start mode	BIT0: Start mode 0: Direct start 1: First braking and then start by startup frequency 2: Rotational speed tracking restart	0	0600H
P6-01	Minimum output frequency	0.00~60.00Hz	0.50Hz	0601H
P6-02	Startup pre-excited current	0~100%	30%	0602H
P6-03	Startup pre-excited time	0.00~60.00s	Model dependent	0603H
P6-04	Startup frequency	0.00~60.00Hz	0.50Hz	0604H
P6-05	Startup frequency holding time	0.00~50.00s	0.0s	0605H
P6-06	Startup DC braking current	0~150%	0%	0606H
P6-07	Startup DC braking time	0.0~300.0s	0.0s	0607H
P6-08	Initial frequency of stop DC braking	0.00~50.00Hz	0.00Hz	0608H
P6-09	Stop brake current	0~150%	0%	0609H
P6-10	Stop brake waiting time	0.0~60.0s	0.0s	060AH
P6-11	Stop DC braking holding time	0.0~600.0s	0.0s	060BH
P6-12	Zero speed holding current	0~150%	0%	060CH
P6-13	torque tracking mode	0: Start from set frequency 1: Start from zero speed 2: Start from maximum frequency	0	060DH
P6-14	Speed tracking waiting time	0.0~600.0s	1.0s	060EH

P6-15	Speed tracking speed	0~100	20	060FH
P6-16	Speed tracking closed loop current KP	0~1000	500	0610H
P6-17	Speed tracking closed loop current KI	0~1000	800	0611H
P6-18	Speed tracking current	30%~200%	Model dependent	0612H
P6-19	Speed tracking current lower limit	10~100%	Model dependent	0613H
P6-20	Speed tracking voltage rise time	5~30s	Model dependent	0614H
P6-21	Speed tracking demagnetization time	0.00~5.00s	Model dependent	0615H
P7 System configuration parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P7-00	Reserved	-	-	0700H
P7-01	User password	0~65535	0	0701H
P7-02	STOP key function	BIT0: 0: Invalid for terminal command 1: Valid for terminal command BIT1: 0: Invalid for communication command 1: Valid for communication command BIT2: 0: Invalid for expansion card command 1: Valid for expansion card command	000	0702H
P7-03	Display speed coefficient	0.000~50.000	1.000	0703H
P7-04	Expansion card type	0~8 0: 485 communication board 1: IO expansion board 2~8: Reserved	0	0704H
P7-05	Monitor selection	2~6 2: Output frequency, output current, output voltage 3: Output frequency, output current, output voltage, DC voltage 4: Output frequency, output current, output voltage, DC voltage, PID 5: Output frequency, output current, output voltage, DC voltage, PID, set	3	0705H

P7-05	Monitor selection	frequency 6: Output frequency, output current, output voltage, DC voltage, PID, temperature, set frequency	3	0705H
P7-06	Total power-on hours	0~65535	Read-only	0706H
P7-07	Total running hours	0~65535	Read-only	0707H
P7-08	Relay inverter status	0~65535	Read-only	0708H
P7-09	MF.K Key function selection	0: REV disabled 1: Reverse operation 2: Forward jog 3: Reverse jog	0	0709H
P8 Auxiliary Functions				
Function Code	Parameter Name	Setting Range	Default	Address
P8-00	Forward JOG running frequency (FJOG)	0.00Hz to maximum frequency	5.00Hz	0800H
P8-01	Reverse JOG running frequency (RJOG)	0.00Hz to maximum frequency	5.00Hz	0801H
P8-02	JOG acceleration time	0.1~6500.0s	10.0s	0802H
P8-03	JOG deceleration time		10.0s	0803H
P8-04	Acceleration time 2		10.0s	0804H
P8-05	Deceleration time 2		10.0s	0805H
P8-06	Emergency stop deceleration time		10.0s	0806H
P8-07	Forward/Reverse rotation dead-zone time	0.0~150.0s	0.0s	0807H
P8-08	Jump frequency 1	0.00Hz to maximum frequency	0.00Hz	0808H
P8-09	Jump frequency 2		0.00Hz	0809H
P8-10	Jump frequency amplitude		0.00Hz	080AH
P8-11	Output frequency detection 1	0.00Hz to maximum frequency	30.00Hz	080BH
P8-12	FDT1 detection width		0.00Hz	080CH

P8-13	Detection range of frequency consistent	0.00Hz to maximum frequency	3.00Hz	080DH
P8-14	Current reaching 1 detection value	0~200.0%	100.0%	080EH
P8-15	Current reaching 1 detection range	0~100.0%	5.0%	080FH
P8-16	Output over-current threshold	0.0~200.0%	100.0%	0810H
P8-17	Output over-current detection delay	0.00~650.00s	0.20s	0811H
P9 Fault and protection parameters				
Function Code	Parameter Name	Setting Range	Default	Address
P9-00	Protection function selection 1	BIT0: Motor overload protection selection 0: Invalid 1: Valid BIT1: Ground fault during power-on 0: Invalid 1: Valid BIT2: Input phase loss protection selection 0: Invalid 1: Valid BIT3: Output phase loss protection selection 0: Invalid 1: Valid	1111	0900H
P9-01	Protection function selection 2	BIT0: Output load loss protection selection 0: Invalid 1: Ramp to stop BIT1: Instantaneous power failure action selection 0: Invalid 1: Valid BIT2: Continue operation frequency selection in case of failure 0: Operate at current operation frequency 1: Operate at set frequency 2: Operate at the upper limit frequency 3: Operate at the lower limit frequency 4: Operation at abnormal standby frequency BIT3: Reserved	0000	0901H
P9-02	Fault auto reset times	0: OFF Automatic reset function is turned off, only manual reset is allowed. 1-20: ON This function is on, 1-20 is the number of times of self recovery after failure (defined as the maximum number of times of auto reset after each failure)	0	0902H
P9-03	Time interval of fault auto reset	0.1~100.0s	1.0s	0903H

P9-04	1st fault type	1 -- ERROR_INVERTER_UNIT 2 -- ERROR_OC_DURING_ACC 3 -- ERROR_OC_DURING_DEC 4 -- ERROR_OC_AT_CONST_SPEED 5 -- ERROR_OV_DURING_ACC 6 -- ERROR_OV_DURING_DEC 7 -- ERROR_OV_AT_CONST_SPEED 8 -- ERROR_CONTROL_POWER_SUPPLY 9 -- ERROR_UV 10 -- ERROR_OL_AC_DRIVE 11 -- ERROR_OL_MOTOR 12 -- ERROR_LOSE_PHASE_INPUT 13 -- ERROR_LOSE_PHASE_OUTPUT 14 -- ERROR_OH_MODULE 15 -- ERROR_EXTERNAL_EQUIPMENT 16 -- ERROR_COMMUNICATE 17 -- ERROR_CONTACTOR 18 -- ERROR_CURRENT_DETECTION 19 -- ERROR_AUTO-TUNING 20 -- ERROR_ENCODER 21 -- ERROR_EEPROM_READWRITE 22 -- ERROR_HARDWARE_AC_DRIVE 23 -- ERROR_MOTOR_SHORT_TO_GND 24 -- ERROR_ERRPROM_INITIALIZE 26 -- ERROR_RUNNING_TIME_REACHED 27 -- ERROR_USER-DEFINED_1 28 -- ERROR_USER-DEFINED_2 29 -- ERROR_POWER-ON_TIME_REACHED 30 -- ERROR_LOAD_0 31 -- ERROR_PID_FDB_LOSE 40 -- ERROR_PBP_CURRENT_LIMIT 41 -- ERROR_SWITCH_MOTOR_WHEN_RUN 42 -- ERROR_TOO_LARGE_SPEED_DEVIATION 43 -- ERROR_MOTOR_OS 45 -- ERROR_MOTOR_OH 51 -- ERROR_POLE_POSITION_DETECTION 52 -- ERROR_ZERO_POSITION_IDENTIFICATION 53 -- ERROR_FEEDBACK_UVW_SIGNAL	Read-only	0904H
P9-05	2nd fault type		Read-only	0905H
P9-06	3rd fault type		Read-only	0906H
P9-07	Failure operation frequency	0.00~655.35Hz	Read-only	0907H
P9-08	Failure output current	0.1~2000.0A	Read-only	0908H
P9-09	Failure DC-bus voltage	0~3000V	Read-only	0909H
P9-10	Failure S terminal status	See input terminal status diagram	Read-only	090AH
P9-11	Failure Y terminal status	See input terminal status diagram	Read-only	090BH
P9-12	Failure AC drive status	BIT0: Direction of operation 0: FWD 1: REV BIT1: Running state 0: STOP 1: CONST 2: ACC 3: DEC BIT2: RESERVED BIT3: RESERVED	Read-only	090CH

P9-13	Failure power on time	0~65535	Read-only	090DH
P9-14	Failure running time	0~65535	Read-only	090EH
P9-15	Frequency upon 2nd fault	0.00~655.35Hz	Read-only	090FH
P9-16	Current upon 2nd fault	0.1~2000.0A	Read-only	0910H
P9-17	Output voltage upon 2nd fault	0~3000V	Read-only	0911H
P9-18	S terminal status upon 2nd fault	Same as P9-10	Read-only	0912H
P9-19	Y terminal status upon 2nd fault	Same as P9-11	Read-only	0913H
P9-20	AC drive status upon 2nd fault	Same as P9-12	Read-only	0914H
P9-21	Power-on time upon 2nd fault	Same as P9-13	Read-only	0915H
P9-22	Running time upon 2nd fault	Same as P9-14	Read-only	0916H
P9-23	Frequency upon 3rd fault	0.00~655.35Hz	Read-only	0917H
P9-24	Current upon 3rd fault	0.1~2000.0A	Read-only	0918H
P9-25	Output voltage upon 3rd fault	0~3000V	Read-only	0919H
P9-26	S terminal status upon 3rd fault	Same as P9-10	Read-only	091AH
P9-27	Y terminal status upon 3rd fault	Same as P9-11	Read-only	091BH
P9-28	AC drive status upon 3rd fault	Same as P9-12	Read-only	091CH
P9-29	Power-on time upon 3rd fault	Same as P9-13	Read-only	091DH
P9-30	Running time upon 3rd fault	Same as P9-14	Read-only	091EH
P9-31	Backup frequency upon abnormality	0.0~100.0%	100.0%	091FH
P9-32	Motor overload protection gain	0.20~10.00	1.00	0920H
P9-33	Motor overload warning coefficient	50~100%	90%	0921H
P9-34	Load loss detection level	0.0~100.0%	10.0%	0922H
P9-35	Load loss detection time	0.0~60.0s	1.0s	0923H
P9-36	Over-speed detection value	0.0~50.0%(Maximum frequency)	20.0%	0924H

P9-37	Over-speed detection time	0.0~60.0s	1.0s	0925H
P9-38	Over-voltage stall gain	0~100%	0%	0926H
P9-39	Over-voltage stall protective voltage	120~150%	130%	0927H
P9-40	Over-current stall gain	0~100	20	0928H
P9-41	Over-current stall protective current	100~200%	150%	0929H
P9-42	Reserved	-	-	092AH
P9-43	Reserved	-	-	092BH
P9-44	Protection action selection 1	BIT0: Motor overload (Err11) action select 0: Immediately-stop, fault alarm 1: Emergency stop, fault alarm 2: Only warning, AC drive continues to operate BIT1: Input phase loss (Err12) action select Same as BIT0 BIT2: Output phase loss (Err13) action select Same as BIT0 BIT3: External fault (Err15) action select Same as BIT0	0000	092CH
P9-45	Protection action selection 2	BIT0: Abnormal communication (Err16) action select Same as P9-50 BIT0 BIT1: Encoder failure (Err20) action select 0: Immediately-stop, fault alarm 1: Emergency stop, fault alarm 2: Switch to VF, continue operation BIT2: Function code reading and writing abnormal (Err21) action selection 0: Immediately-stop, fault alarm 1: Emergency stop, fault report BIT3: Motor overheating (Err45) action select Same as BIT0	0000	092DH
P9-46	Protection action selection 3	BIT0: User defined fault 1 (Err27) action selection Same as P9-50 BIT0 BIT1: User defined fault 2 (Err28) action selection Same as BIT0 BIT2: Power on time arrival (Err29) action selection Same as BIT0	0000	092EH

P9-46	Protection action selection 3	BIT3: Load loss (Err30) action selection 0: Immediately-stop, fault alarm 1: Emergency stop, fault alarm 2: Directly jump to 7% of the rated frequency of the motor to continue operation, and automatically return to the set frequency operation during no-load operation	0000	092EH
P9-47	SC detection filter time	0~1000	15	092FH
PA Process PID control parameters				
Function Code	Parameter Name	Setting Range	Default	Address
PA-00	PID setting source	0: PID setting source 1: AI1 2: AI2 3: Reserved 4: Reserved 5: Communication setting 6: PLC setting 7: UP/DW control 8: Terminal selection	0	0A00H
PA-01	PID digital setting	0.0~100.0%	50.0%	0A01H
PA-02	PID control feedback signal source	0: PID setting source 1: AI1 2: AI2 3: Reserved 4: Reserved 5: Communication feedback 6: AI1 + AI2 7: MAX(AI1 , AI2) 8: MIN(AI1 , AI2) 9: Option card	2	0A02H
PA-03	PID digital feedback	0.0~100.0%	100.0%	0A03H
PA-04	Feedback signal gain	0.000~10.000	1.000	0A04H
PA-05	Feedback signal range	0.00~655.35	1.00	0A05H
PA-06	PID control selection 1	BIT0: Feedback feature selection 0: Positive characteristic when the feedback signal of PID is less than the given value, the output frequency of AC drive will rise. 1: Negative characteristic when the feedback signal of PID is less than the given value, the output frequency of AC drive will decrease. BIT1: PID parameter switching condition 0: No switching 1: Switching through S terminal 2: Switch automatically according to deviation BIT2: Integral separation 0: Invalid 1: Valid	0000	0A06H

PA-06	PID control selection 1	When the multi-functional digital terminal integration pause is effective, the PID integration stops operation, and at this time, the PID only has the proportional and differential functions. BIT3: Stop integration after output to limit value 0: Continue integral 1: Stop integral After the PID operation output reaches the maximum or minimum value, you can choose whether to stop the integration. If stop integral is selected, then PID integral stops calculation at this time, which may help to reduce PID overshoot.	0000	0A06H
PA-07	PID control selection 2	BIT0: PID shutdown operation 0: Shutdown without calculation 1: Operation when shutdown BIT1: Constant pressure water supply sleep function 0: Invalid 1: Valid BIT2: Reserved BIT3: Reserved	0000	0A07H
PA-08	Proportional gain Kp1	0.00~100.00	20.00	0A08H
PA-09	Integral time Ti1	0.00~10.00s	2.00s	0A09H
PA-10	Differential time Td1	0.000~10.000s	0.000s	0A0AH
PA-11	Cut-off frequency of PID reverse rotation	0.00~maximum frequency	2.00Hz	0A0BH
PA-12	PID deviation limit	0.0~100.0%	0.0%	0A0CH
PA-13	PID differential limit	0.00~100.00%	0.10%	0A0DH
PA-14	PID setting change time	0.00~10.00s	0.00s	0A0EH
PA-15	PID feedback filter time	0.00~650.00s	0.00s	0A0FH
PA-16	PID output filter time	0.00~60.00s	0.00s	0A10H
PA-17	Reserved	-	-	0A11H
PA-18	Proportional gain Kp2	0.00~100.00	20.00	0A12H
PA-19	Integral time Ti2	0.00~10.00s	2.00s	0A13H
PA-20	Differential time Td2	0.000~10.000s	0.000s	0A14H

PA-21	PID parameter switchover deviation 1	0.0~PA-22	20.0%	0A15H
PA-22	PID parameter switchover deviation 2	PA-21~100.0%	80.0%	0A16H
PA-23	PID initial value	0.0~100.0%	0.0%	0A17H
PA-24	PID initial value running time	0.0~6500.0s	0.0s	0A18H
PA-25	Maximum deviation between two PID outputs in forward direction	0.00~100.00%	1.00%	0A19H
PA-26	Maximum deviation between two PID outputs in reverse direction	0.00~100.00%	1.00%	0A1AH
PA-27	Detection value of disconnection alarm	0.0~100.0%	0.0%	0A1BH
PA-28	Feedback disconnection detection time	0.0~120.0s	1.0s	0A1CH
PA-29	Dormant judgment benchmark	0.1~100.0%	95.0%	0A1DH
PA-30	Dormant base duration	0.1~6500.0s	30.0s	0A1EH
PA-31	Enter dormant deceleration time	0.1~6500.0s	60.0s	0A1FH
PA-32	Sleep low holding frequency	0.00~20.00Hz	10.00Hz	0A20H
PA-33	Low frequency operation time	0.0~6500.0s	10.0s	0A21H
PA-34	Wake-up base	0.0~100.0%	50.0%	0A22H
PA-35	Wake-up base duration	0.0~6500.0s	30.0s	0A23H
PB Communication control function parameters				
Function Code	Parameter Name	Setting Range	Default	Address
PB-00	Master-slave selection	Master-slave selection 0: Slave 1: Master	0	0B00H
PB-01	Address	1~247	1	0B01H

PB-02	Baud rate selection	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps 6: 57600bps 7: 115200bps	3	0B02H
PB-03	Data format	0: (N,8,1)No check,data format:8, stop bit:1 1: (E,8,1)Even parity check,data format:8, stop bit:1 2: (O,8,1)Odd Parity check,data format:8, stop bit:1 3: (N,8,2)No check,data format:8, stop bit:2 4: (E,8,2)Even parity check,data format:8, stop bit:2 5: (O,8,2)Odd Parity check,data format:8, stop bit:2	3	0B03H
PB-04	Communication proportion setting	0.000~5.000	1.000	0B04H
PB-05	Communication response delay	0.000~0.500s	0.000s	0B05H
PB-06	Communication timeout failure time	0.1~100.0s	0.0s	0B06H
PB-07	Transmission response processing	0: Write response 1: Write no response	0	0B07H
PB-08	Master send selection	BIT0: The first set of transmission frame selection 0: Invalid 1: Run command setting 2: Master set frequency 3: Master output frequency 4: Master upper limit frequency 5: Master set torque (reserved) 6: Master output torque 7: Limit of forward speed of master torque control (reserved) 8: Limit of reserved speed of master torque control (reserved) 9: PID set by the mater A: Master feedback PID BIT1: Second set of transmission frame selection Ditto BIT2: The third set of transmission frame selection Ditto BIT3: Selection of the fourth set of transmission frames Ditto	0031	0B08H

PC Optimization Parameters				
Function Code	Parameter Name	Setting Range	Default	Address
PC-00	Dynamic braking turn-on voltage	Model confirmation 220V: 360V 380V: 690V 480V: 800V 690V: 1160V 1140V: 1850V	*	0C00H
PC-01	DC Bus over voltage protection value	0~2500.0V	810.0V	0C01H
PC-02	DC Bus under voltage protection value	200~2000V	350V	0C02H
PC-03	Under voltage fault handling mode	0: Fault 1: Continue operation within undervoltage recovery allow time 2: Continue operation after power supply returns to normal	0	0C03H
PC-04	Under voltage recovery allow time	0.1~60.0s	2.0s	0C04H
PC-05	Overmodulation coefficient	100~120%	110%	0C05H
PC-06	Short-circuit filtering coefficient	0.0~100.0s	15.0s	0C06H
PD Internal control PLC Function and frequency parameters				
Function Code	Parameter Name	Setting Range	Default	Address
PD-00	Multi-frequency 1	0~100.0%	20.0%	0D00H
PD-01	Multi-frequency 2		40.0%	0D01H
PD-02	Multi-frequency 3		60.0%	0D02H
PD-03	Multi-frequency 4		80.0%	0D03H
PD-04	Multi-frequency 5		100.0%	0D04H

PD-05	Multi-frequency 6	0~100.0%	80.0%	0D05H
PD-06	Multi-frequency 7		60.0%	0D06H
PD-07	Multi-frequency 8		40.0%	0D07H
PD-08	PLC running mode	BIT0: Circulation mode 0: Stop after the AC drive runs one cycle 1: Repeat after the AC drive runs one cycle 2: Keep final values after the AC drive runs one cycle BIT1: Chronograph unit 0: Second 1: Minute 2: Hour BIT2: Power down storage mode 0: No 1: Yes BIT3: Start-up mode 0: Rerun from stage one 1: Rerun from downtime 2: Continue operation with the rest of the downtime phase	0000	0D08H
PD-09	Running time of PLC reference 1	0.0~6500.0 (s/m/h)	10.0	0D09H
PD-10	Running time of PLC reference 2		10.0	0D0AH
PD-11	Running time of PLC reference 3		10.0	0D0BH
PD-12	Running time of PLC reference 4		10.0	0D0CH
PD-13	Running time of PLC reference 5		10.0	0D0DH
PD-14	Running time of PLC reference 6		10.0	0D0EH
PD-15	Running time of PLC reference 7		10.0	0D0FH
PD-16	Running time of PLC reference 8		10.0	0D10H

PD-17	Running direction and acceleration/deceleration time of PLC reference 1	BIT0: Operation direction of this section 0: Forward 1: Reverse BIT1: Acceleration and deceleration time of this section 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4 BIT2: Reserved BIT3: Reserved	0000	0D11H
PD-18	Running direction and acceleration/deceleration time of PLC reference 2		0000	0D12H
PD-19	Running direction and acceleration/deceleration time of PLC reference 3		0000	0D13H
PD-20	Running direction and acceleration/deceleration time of PLC reference 4		0000	0D14H
PD-21	Running direction and acceleration/deceleration time of PLC reference 5		0000	0D15H
PD-22	Running direction and acceleration/deceleration time of PLC reference 6		0000	0D16H
PD-23	Running direction and acceleration/deceleration time of PLC reference 7		0000	0D17H
PD-24	Running direction and acceleration/deceleration time of PLC reference 8		0000	0D18H

U Monitoring Parameters				
Function Code	Parameter Name	Setting Range	Default	Address
U-00	Set frequency	-	-	2110H
U-01	Output frequency	-	-	2111H
U-02	Output current	-	-	2112H
U-03	Output voltage	-	-	2113H
U-04	Input voltage	-	-	2114H
U-05	Mechanical speed	-	-	2115H
U-06	Bus voltage	-	-	2116H
U-07	Output power	-	-	2117H
U-08	Target torque	-	-	2118H
U-09	Output torque	-	-	2119H
U-10	PID setting	-	-	211AH
U-11	PID feedback	-	-	211BH
U-12	AI1 input value	-	-	211CH
U-13	AI2 input value	-	-	211DH
U-14	Reserved	-	-	211EH
U-15	Counter count value	-	-	211FH
U-16	Reserved	-	-	2120H
U-17	Terminal S Status	-	-	2121H
U-18	Terminal Y Status	-	-	2122H
U-19	A01 output value	-	-	2123H
U-20	Reserved	-	-	2124H
U-21	Reserved	-	-	2125H
U-22	Reserved	-	-	2126H
U-23	Model temperature	-	-	2127H
U-24	Output excitation	-	-	2128H
U-25	Power factor	-	-	2129H
U-26	Power-on time	-	-	212AH
U-27	power-on operation time	-	-	212BH
U-28	Accumulated time	-	-	212CH
U-29	AC drive running state	-	-	212DH
U-30	Maximum current	-	-	212EH
U-31	Maximum voltage	-	-	212FH
U-32	Maximum temperature of this operation	-	-	2130H

U-33	Miniamum voltage	-	-	2131H
U-34	Rated power of AC drive	-	-	2132H
U-35	Rated voltage of AC drive	-	-	2133H
U-36	Rated current of AC drive	-	-	2134H
U-37	AC version	-	-	2135H
U-38	MC version	-	-	2136H
U-39	Communication frequency	-	-	2137H
U-40	Main frequency X display	-	-	2138H
U-41	Auxiliary frequency Y display	-	-	2139H
U-42	Remaining time	-	-	213AH
U-43	Target voltage upon V/F separation	-	-	213BH
U-44	Output voltage upon V/F separation	-	-	213CH

10.RS485 communication protocol

● Introduction to communication protocol

EC100 series AC drive is equipped with RS485 communication interface as standard, and adopts master-slave communication of international standard ModBus communication protocol. Users can realize centralized control (set converter control command、operation frequency、modification of relevant function code parameters, monitoring of converter working status and fault information, etc.) through PC / PLC, master computer, main station AC drive, etc., to adapt to specific application requirements.

● Application mode

1. EC100 series AC drive has a "single master and multi slave" control network connected to RS485 bus. When the master uses the broadcast command (slave address is 0), the slave does not answer.
2. EC100 only provides RS485 interface, asynchronous half duplex. If the communication port of external equipment is RS232, an additional RS232 / RS485 converter is required.
3. Modbus protocol defines the information content and use format of asynchronous transmission in serial communication, which can be divided into rut mode and ASCII mode. 6000 is RTU (remote terminal unit) mode.

● Frames in Communication structure

The format of communication data is as follows:
Byte composition: including start bit, 8 data bits, parity bit and stop bit.

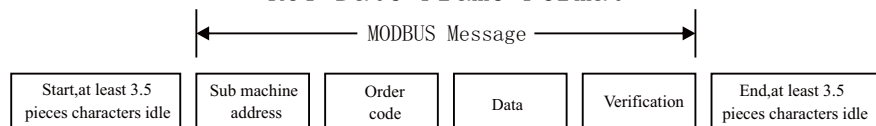
Start Bit	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8	Parity Bit	Stop Bit
-----------	------	------	------	------	------	------	------	------	------------	----------

The information of a frame must be transmitted in a continuous data stream. If the interval of more than 1.5 bytes before the end of the whole frame transmission, the receiving device will clear these incomplete information and mistakenly think that the next byte is the address domain part of the new frame. Similarly, if the interval time between the start of a new frame and the previous frame is less than 3.5 bytes, the receiving device will consider it as the continuation of the previous frame. Due to the frame confusion, the final CRC check value is not correct, resulting in communication errors.

Frame header	3.5 bytes transmission time
slave address	mail address: 0-247 (decimal) (0 is broadcast address)
Command code	03h: read slave parameters 06h: write slave parameters 08h: loop self test
Data area	Parameter address, number of parameters, parameter value, etc
CRC CHK low	Test value: 16 bit CRC test value
CRC CHK high	
Frame tail	3.5 bytes transmission time

In the RTU mode, the new one frame use at least 3.5 pieces bytes transmit time stop interval as start. The follow transmit data region are in proper sequence: sub machine address, operation order code, data and CRC verify byte, each region transmit byte all are hexadecimal 0....9, A....F. The internet equipment continue sense the internet bus line, include within the stop interval time. When received the first region(address information), each internet equipment all decoding this byte to judge whether it is send to own. At the final one byte transmit finished, and make one at least 3.5 pieces bytes transmit time interval to present this frame finished, after this, a new message can start.

RUT Date Frame Format



● Order code and communication data description

Order code: 03H, read N pieces byte(word), the max can continue read five words.

Example: from the AC drive which sub machine address is 01h, the start address of memory is 2100H([C-00]), reading continue 3 pieces words, then the structure description of this frame as below:

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	03H
Start address high position	21H
Start address low position	00H
Data quantity high position	00H
Data quantity low position	03H
CRC CHK low position	0FH
CRC CHK high position	F7H
END	3.5 pieces bytes transmit time

RTU sub machine responding information(when normal)

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	03H
Bytes quantity low position	06H
Data address 2100H high position	13H
Data address 2100H low position	88H
Data address 2101H high position	00H
Data address 2101H low position	00H

Data address 2102H high position	00H
Data address 2102H low position	00H
CRC CHK low position	90H
CRC CHK high position	A6H
END	3.5 pieces bytes transmit time

RTU sub machine responding information (when abnormal)

START	3.5 bytes transmit time
Sub machine address	01H
Order code	83H
Error code	04H
CRC CHK low position	40H
CRC CHK high position	F3H
END	3.5 bytes transmit time

Order code:06H, write one word

Function: write one word data into appointed data address, can use into modify the frequency transformer parameter value.

Example: write the 5000(1388H) in the 3000H address of sub machine address 1 frequency transformer. Then the structure description of this frame as below:

RTU main machine order information

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	06H
Check the code high position	30H
Check the code low position	00H
Data high position	13H
Data low position	88H
CRC CHK low position	8BH
CRC CHK high position	9CH
END	3.5 pieces bytes transmit time

RTU sub machine responding information(when normal)

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	06H
Check the code high position	30H
Check the code low position	00H
Data high position	13H
Data low position	88H
CRC CHK low position	8BH
CRC CHK high position	9CH
END	3.5 pieces bytes transmit time

RTU sub machine responding information(when abnormal)

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	86H
Error code	01H
CRC CHK low position	83H
CRC CHK high position	A0H
END	3.5 pieces bytes transmit time

Order code: 08H, return circuit self check

Function: send back the sub machine responding information which same to the main machine order information, used to check whether the signal transmit between main machine and sub machine are normal.

RTU main machine order information

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	08H
Check the code high position	00H
Check the code low position	00H
Data high position	13H
Data low position	88H
CRC CHK low position	EDH
CRC CHK high position	5DH
END	3.5 pieces bytes transmit time

RTU sub machine responding information (when normal)

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	08H
Check the code high position	00H
Check the code low position	00H
Data high position	13H
Data low position	88H
CRC CHK low position	EDH
CRC CHK high position	5DH
END	3.5 pieces bytes transmit time

RTU sub machine responding information (when abnormal)

START	3.5 pieces bytes transmit time
Sub machine address	01H
Order code	88H
Error code	03H
CRC CHK low position	06H
CRC CHK high position	01H
END	3.5 pieces bytes transmit time

● Communication frame error verify method

The standard Modbus series internet adopt two type error test method. Odd-even verification used to verify each character, CRC test used to verify one frame data.

1: Odd-even verification

The user can configure the controller at odd or even verification, or no verification. This will decide the odd-even verification position of each character how to set.

If appointed odd or even verification, the digit bit of “1” will count the digit bit of each character(ASCII mode 7 data capacity, 8 data bit in RTU). Example, RTU character frame include the below 8 pieces data bit: the number of whole “1” in 1 1 0 0 0 1 0 1 is 4 pieces, if use even verification, the odd-even verification bit of frame will be 0, then obtain the quantity of whole “1” still be 4, also not process verification test. Replace one attached stop bit fill to the need transmit character frame.

2: CRC-16(circulating redundancy verification)

Use RTU frame format, the frame include the counting frame error test area which based on CRC method. CRC region test the content of the whole frame. CRC region is two bits, include the 16 bits binary system value. This calculating method of CRC adopt international standard CRC verification rules, the user can reference the relate standard CRC algorithm when edit the CRC algorithm, write out the CRC calculating procedure which really in accordance with requirements.

● The definition of communication data address

This part is the address definition of communication data, used to control the running of AC drive, obtain the status information of AC drive and the relate function parameter setting of AC drive, etc.

(1) EC100 series function parameter address description rules

Use the function parameter serial number of AC drive as the register address, divided into two parts at high bits and low bits. High bits represent the function parameter located group serial number, low bits represent the serial number in group of function parameter, need translate into hexadecimal. The address of detail parameter please check the communication address column in the parameter overview table in chapter.

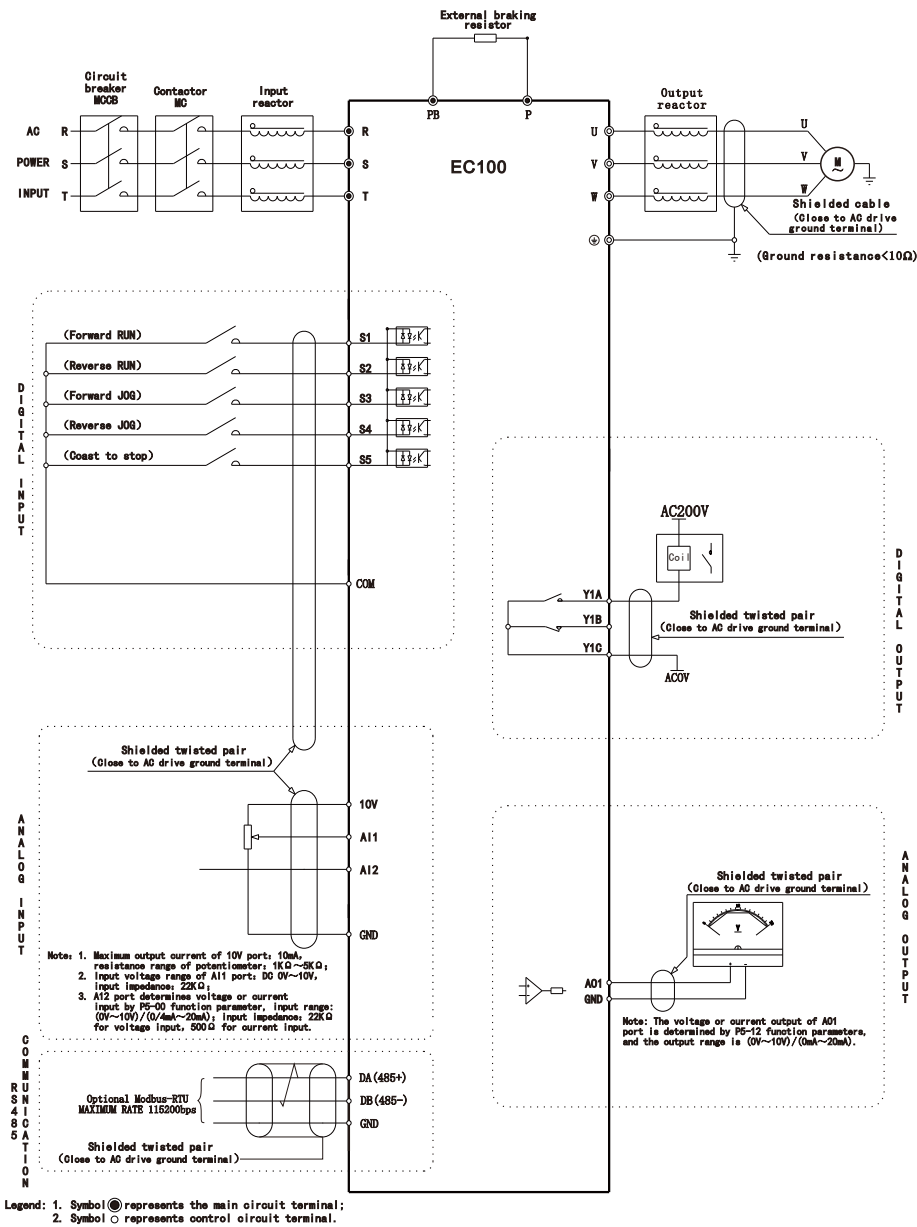
Note: because the communication exist the possibility that frequently rewrite parameter value, if EEPROM frequently been storage then will reduce the working life. For the users, some function code parameter needn't storage under the communication mode, only need to change the value of RAM in the sheet then can meet use requirements. AC80B communication agreement stipulated that when use the write order, only write in AC drive RAM, not storage when power off, if use write order (41H), write in EEPROM, means storage when power off.

Control order function instruction	Address definition	Data meanings instruction		R/W characteristics
Communication running control order	2000H	BIT0	0-stop order 1-Running order	W
		BIT1	0-Corotation order 1-Reversal order	
		BIT2	STOP command	
		BIT3	0-No order 1-Reset order	
		BIT4	Jog command	
		BIT12-15	Reserved	
Communication frequency setting	2001H	Setting range:0-Maximum frequency		W
Communication set upper limit frequency	2002H	Setting range:0-Maximum frequency		W
Communication PID give value	2003H	Setting range: 0-100.0%		W
Communication PID feedback value	2004H	Setting range: 0-100.0%		W
Communication AO1 output value	2005H	Setting range: 0-100.0%		W
Reserved	2006H	Setting range: 0-100.0%		W
Reserved	2007H	Setting range: 0-50000Hz		W
Communication VF separate voltage setting	2008H	Setting range: 0-100.0%		W
Communication torque setting value	2009H	Setting range: 0-100.0%		W

Monitor command function instruction	Address definition	Data meanings instruction		R/W characteristics
AC drive operation status	2100H	BIT0	RUN	R
		BIT1	REV	
		BIT2	Ready	
		BIT3	Fault	
		BIT4	Jogging	
		BIT5	Pre-alarm	
		BIT6	Auto-turning	
		BIT7-10	Operation control mode 0:Operation panel control 1:Terminal control 2:RS485 control 3:Option card 4:Terminal switchover	

AC drive operation status	2100H	BIT11-12	Motor control mode 0: V/F mode 1: SVC control 2: Reserved	R
		BIT13	Hibernation sign	
AC drive fault type	2101	1 -- ERROR_INVERTER_UNIT 2 -- ERROR_OC_DURING_ACC 3 -- ERROR_OC_DURING_DEC 4 -- ERROR_OC_AT_CONST_SPEED 5 -- ERROR_OV_DURING_ACC 6 -- ERROR_OV_DURING_DEC 7 -- ERROR_OV_AT_CONST_SPEED 8 -- ERROR_CONTROL_POWER_SUPPLY 9 -- ERROR_UV 10 -- ERROR_OL_AC_DRIVE 11 -- ERROR_OL_MOTOR 12 -- ERROR_LOSE_PHASE_INPUT 13 -- ERROR_LOSE_PHASE_OUTPUT 14 -- ERROR_OH_MODULE 15 -- ERROR_EXTERNAL_EQUIPMENT 16 -- ERROR_COMMUNICATE 17 -- ERROR_CONTACTOR 18 -- ERROR_CURRENT_DETECTION 19 -- ERROR_AUTO-TUNING 20 -- ERROR_ENCODER 21 -- ERROR_EEPROM_READWRITE 22 -- ERROR_HARDWARE_AC_DRIVE 23 -- ERROR_MOTOR_SHORT_TO_GND 24 -- ERROR_ERRPROM_INITIALIZE 26 -- ERROR_RUNNING_TIME_REACHED 27 -- ERROR_USER-DEFINED_1 28 -- ERROR_USER-DEFINED_2 29 -- ERROR_POWER-ON_TIME_REACHED 30 -- ERROR_LOAD_0 31 -- ERROR_PID_FDB_LOSE 40 -- ERROR_PBP_CURRENT_LIMIT 41 -- ERROR_SWITCH_MOTOR_WHEN_RUN 42 -- ERROR_TOO_LARGE_SPEED_DEVIATION 43 -- ERROR_MOTOR_OS 45 -- ERROR_MOTOR_OH 51 -- ERROR_POLE_POSITION_DETECTION 52 -- ERROR_ZERO_POSITION_IDENTIFI- CATION 53 -- ERROR_FEEDBACK_UVW_SIGNAL		R

11. Standard wiring diagram



12. Warranty Service



Professional AC Drive Manufacturer

Warranty Card

User Name			
User Address			
User Contact		Tel.	
Specification		Number	
Distributor			
Contacts		Date of delivery	

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