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AM Series Drive Use Manual

01/2024

Thank you very much for choosing REXON DRIVE
Mini High Performance Vector Drive. Please read this
manual carefully before installation and using, in order to
use it correctly and safely.

Contents

1 Safety precautions	01
2 Installation and connection	01
3 Commissioning	05
3.1 Operation panel	05
3.2 Motor control mode	07
3.3 Start-stop control	08
3.4 Speed set-point	09
4 Fault	10
5 Function code	13
6 Modbus-RTU protocol	47
6.1 RTU data frame	47
6.2 Modbus command code	48
6.3 Error checking of communication frame	51
6.4 Modbus related function codes	52
6.5 Modbus Control command table	52
6.6 Example of controlling motor start-stop and speed setting	53

1 Safety precautions

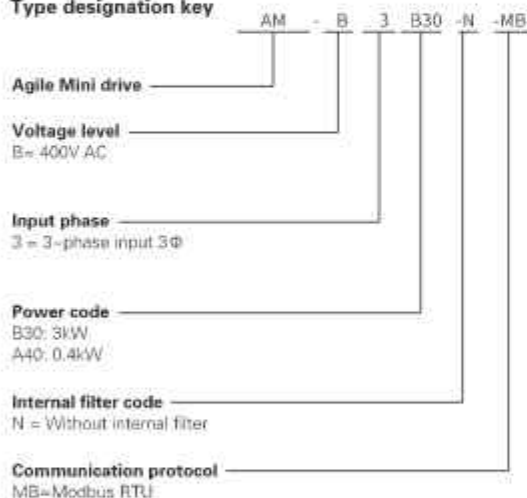
Safety precautions

⚠ WARNING!

- ✓ Only qualified professionals are allowed to install, operate and maintain the drive!
- ✓ Contact with live parts may cause physical injury. To check, first turn off the power, there is still high voltage inside the drive before the digital light goes out. DO NOT touch the internal terminals and circuits.
- ✓ Danger of fire if overheating due to insufficient ventilation space, so install it in a suitable environment.
- ✓ Each terminal can only be applied with the voltage specified in the manual, or it may cause failure or damage.
- ✓ Please connect correctly, otherwise it may cause damage to the drive or physical injury.

2 Installation and connection

Type designation key

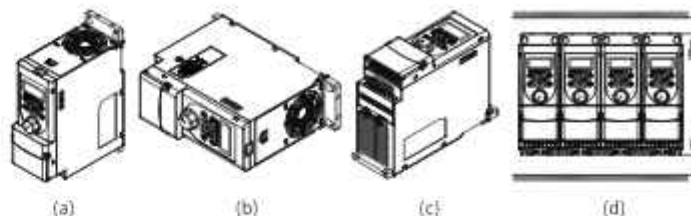


Installation environment

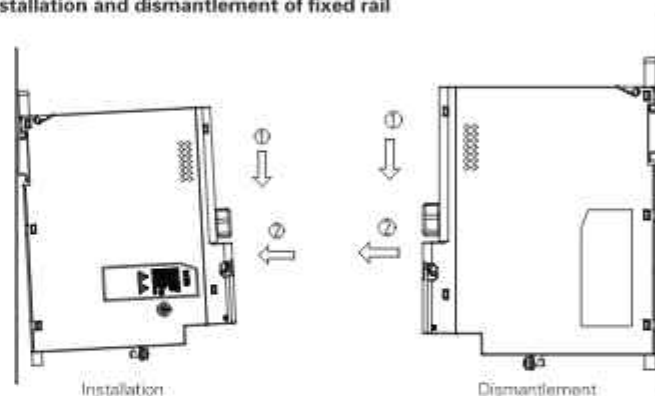
Ambient temperature	-20°C~+50°C(Unlimited)
Ambient humidity	Blow 95% (No frost)
Storage temperature	-40°C ~ +70°C
Surrounding environment	Indoor, No corrosive gas, No flammable gas, No combustible dust
Altitude	Without derating, below 1000m
	With derating 1000~4000m
Degree of protection	IP20
Contamination level	Suitable for Class 2 environment.

Installation

The drive should be installed vertically as shown in Figure (a), motor terminal and power terminal face down, and the fan faces up. Incorrect installation as Figure (b) and Figure (c). Figure (d) shows the side-by-side installation, leaving 100mm of space above and below.

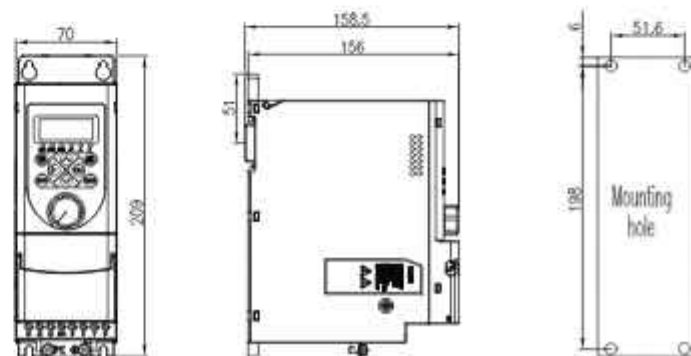


Installation and dismantlement of fixed rail

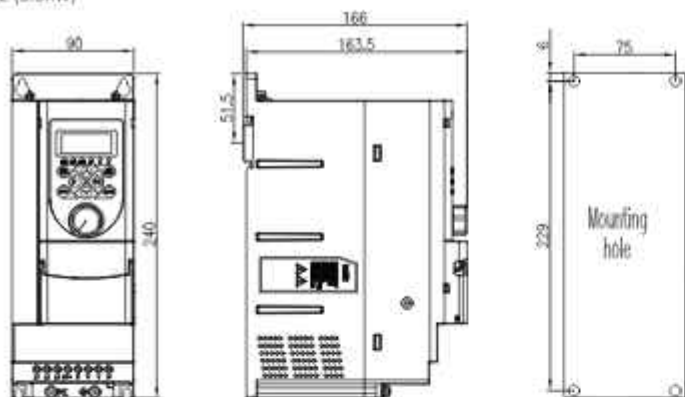


Overall and installation dimension

M1 (0.75kW~3kW)



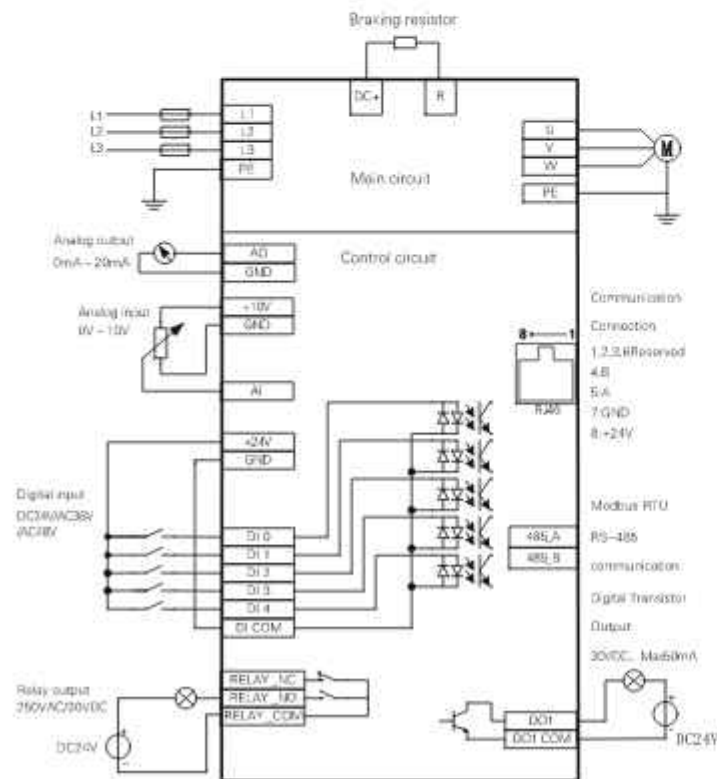
M2 (5.5kW)



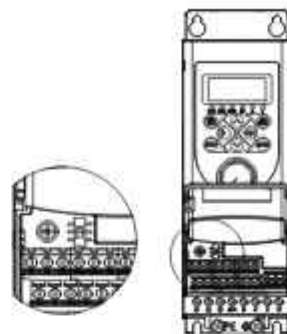
Note: (1) The dimensions are given in millimeters;

(2) Need 4 M4 combination screws and 4 M4 nuts to fix, Tightening torque: 2.5Nm.

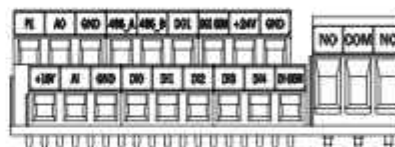
Terminal connection diagram



Note: If the IT (large ground) system or corner grounded TN system are used, please remove the internal EMC grounding screw and replace it with the plastic screw provided by our company, otherwise, the inverter may be damaged. (The position of EMC grounding screw is shown in the figure below).



Control terminal strip



Function	Terminal name	Explanation and function description	Technical data
communication function	485_A- 485_B	RS-485	•Support Modbus RTU •Optocoupler isolation
Output Power supply	+24V	Digital output terminal power supply 24V	24VDC ± 10% , 200mA max.
	+10V	Analog input terminal power supply 10V	11.7VDC ± 5%Vdc , 200mA max.
Digital input	DI0	5 digital inputs (DI)	•Compatible with optoc output •Less than 5V is low, more than 11V is High •Support DC24V, AC36V, AC85V input
	DI1		
	DI2		
	DI3		
	DI4		
	DI_COM		
Analog input	AI	1 analog input(AI)	•Single-ended input •Support voltage type 0-10V •Error: ±1%
	NO, COM, NC	1 relay input COM is common part, NO is normally open part, NC is normally closed part.	•Maximum switching voltage 30VDC/250VAC •Maximum continuous current 2A •Maximum switching current 2A30VDC/2A250VAC
Digital output	DO1	1 digital transistor output	•30VDC , 50mA max
	DO1_COM		
Analog output	AO	1 Analog output (AO)	•Single-ended output •Current output, output range 0-20mA •Error: ±1%

Note: Noting the voltage and current specifications of the terminal to avoid damaging equipment. When the control terminal is connected with external equipments.

Note 2: Connection requirements of control signal:

- Analog signal: must use shielded cable, recommended to use twisted pair shielded cable. Each analog signal occupies a twisted pair. All shielding cables should be twisted into a bundle and connected to PE.
- Digital signal: recommended to use shielded cable. Unshielded twisted pair cables can also be used; the analog signal and digital signal should be routed separately using different cables.
- Relay signal: the relay signal with voltage less than 48V can be routed together with the digital signal.
- Cannot put 24V DC signal and 115/230V AC signal into a same cable.
- Wiring required for several control cabinets: install equipment of bonding for all control cabinets, connect shielded cables to the PE terminal.

3.2 Control mode of motor

Mini drive supports VF and SVC control. We can set function code B05.00=0 to choose VF, and B05.00=1 to choose SVC.

● Motor parameters and their identification

Mini drive supports VF and SVC control. We can set function code B05.00=0 to choose VF, and B05.00=1 to choose SVC.

Function code	Name of parameters	Default value	Setting range	Description
D00.01	Rated motor power	Type dependent	0.00 - 655.35kW	Nameplate parameters of motor
D00.02	Rated motor voltage	Type dependent	0 - 1500V	
D00.03	Rated motor current	Type dependent	0.00 - 655.35A	
D00.04	Rated motor frequency	Type dependent	0.0 - 600.00Hz	
D00.05	Rated motor speed	Type dependent	0 - 6553rpm	

If vector control is selected to control the motor, accurate parameters of motor are needed. In order to get a better performance, it is necessary to identify the parameters of the controlled motor.

Function code	Name of parameter	Default value	Value scope	Description
B00.21	Identify requests	0	0 - 3	0. Null 1. Simple static ratio identification of asynchronous motor. 2. Complete static ratio identification of induction motor. 3. Complete dynamic ratio identification of induction motor

The difference between the three parameter recognition modes is shown in the following table, please select according to the actual application:

Mode	Conditions of Use	Identification parameters	Description
Simple static ratio identification of asynchronous motor.	Motor cannot run	Stator resistance	
Complete static ratio identification of induction motor.	Motor cannot run	Stator resistance Rotor resistance Leakage inductance	Before identification, please ensure that motor is separated from the load machine and no danger in running. If the motor is connected to the load, the identification result may not be accurate enough.
Complete dynamic ratio identification of induction motor.	Motor can run	Mutual inductance No load current	

The performance of vector control is easily affected by motor parameters, obtaining accurate motor parameters is the key to realize high performance vector control.

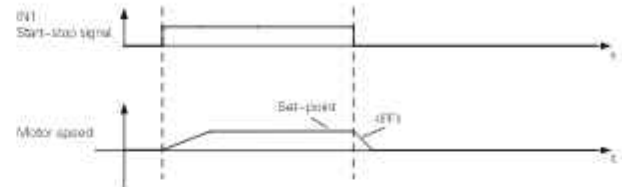
In order to obtain good driving performance and operating efficiency, it is necessary to identify the parameters of controlled motor, which can be manually input if accurate motor parameters are confirmed. Inaccurate motor parameters may cause the motor running abnormally.

3.3 Start-stop control

There are 6 ways to control the start, stop and direction of motor through DI terminal or interconnection parameter input, corresponding to the 6 options of control mode B01.D1.

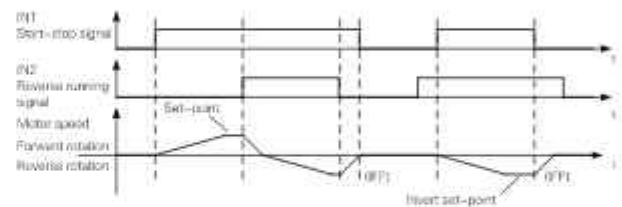
● 1.IN1 start

IN1 controls the start and stop of the motor, the rotation direction of the motor is determined by the current connection phase of drive input.



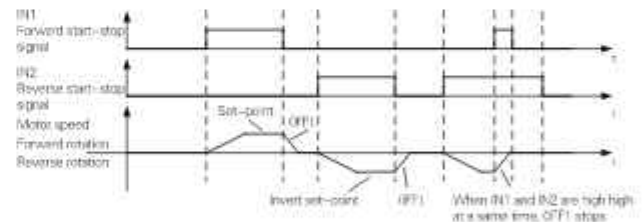
● 2.IN1 Start, IN2 direction

IN1 controls start and stop, IN2 receives high level and then inverts speed.



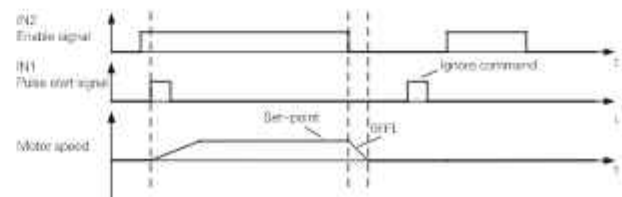
● 3.IN1 forward start, IN2 reverse start

IN1 controls forward start and stop, IN2 controls reverse start and stop.



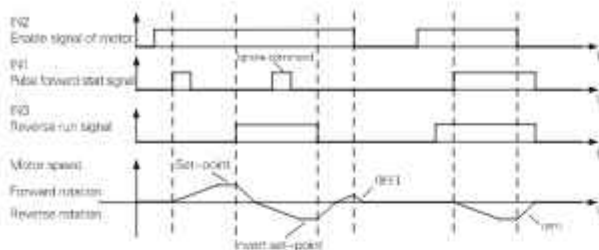
● 4.IN1P start, IN2 stop

When IN2 is low, motor starting is disabled; when IN2 is high and IN1 receives pulse signal, the motor starts.



● IN1P start, IN2 stop, IN3 direction

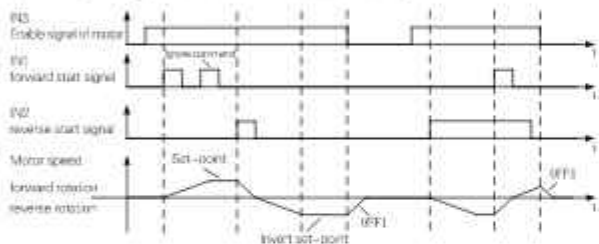
When IN2 receives low level, motor starting is prohibited; when IN2 receives high level, IN1 receives pulse signal, the motor starts. When IN2 receives high level, speed reverses.



● 6.IN1P forward start, IN2P reverse start, IN3 stop

When IN3 receives low level, motor starting is disabled.

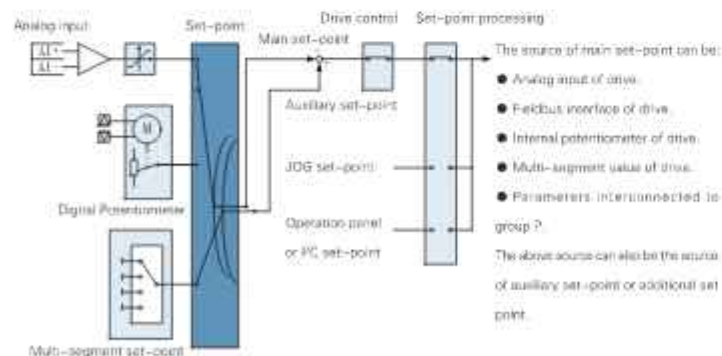
IN3 receives high level, IN1 receives pulse signal then the motor starts forwardly, IN2 receives pulse signal then the motor starts reversely.



3.4 Speed set-point

AM drive selects speed setting source through B02.00.

The main set-point is mostly the target speed set-point of motor.



4 Fault

Index	Name of fault	Subcode of fault	Meaning of subcode	Countermeasures
1	Overcurrent	1	Overcurrent 1	<ol style="list-style-type: none"> 1. Eliminate the problem of power line damage. 2. Check whether the wiring is short circuited. 3. Increase acceleration and deceleration time. 4. In VF control, reduce the boost of VF torque. 5. Make sure the motor stops stably before starting. 6. Reduce or cancel the limit. 7. In the vector control, please make sure whether the correct parameter recognition operation has been carried out. 8. Contact after-sales or manufacturer for technical support.
		2	Overcurrent 2	
		3	Overcurrent 3	
2	Overvoltage	1	Quick check the overvoltage of bus voltage	<ol style="list-style-type: none"> 1. Check whether the input power is within a reasonable range. 2. Increase deceleration time. 3. Reboot braking resistor or braking unit. 4. Contact after-sales or manufacturer for technical support.
3	Undervoltage	1	Bus undervoltage	<ol style="list-style-type: none"> 1. Check whether the input power is within a reasonable range. 2. Make sure whether the power grid is powered off instantaneously. 3. Contact after-sales or manufacturer for technical support.
5	Drive overload	1	Drive overload	<ol style="list-style-type: none"> 1. Verify that the drive is appropriate, or replace a large capacity drive. 2. In VF control, decrease the boost of VF torque. 3. In vector control, reduce torque limit. 4. Make sure whether the load is too high, or there is a locking situation such as holding brake. 5. In vector control, make sure whether the correct parameter self-learning operation is carried out. 6. Contact after-sales or manufacturer for technical support.
6	Motor overload	1	Motor overload	<ol style="list-style-type: none"> 1. Make sure whether the motor load is too high. 2. In vector control, make sure whether the motor parameter self-learning operation is carried out. 3. Make sure whether the load is too high, or there is a locking situation such as holding brake. 4. Make sure whether the motor nameplate parameters are set correctly. 5. Contact after-sales or manufacturer for technical support.

Index	Name of fault	Subcode of fault	Meaning of subcode	Countermeasures
7	Input phase loss	1	Check input phase line	1. Check whether the power input cable is in good contact. 2. Contact after-sales or manufacturer for technical support.
8	Output phase loss	1	Input missing of phase U	1. Check whether the corresponding output cable is wired correctly and in a good contact. 2. Confirm whether the motor runs smoothly. 3. Contact after-sales or manufacturer for technical support.
		2	Input missing of phase V	
		3	Input missing of phase W	
		5	3-phase input seriously unbalanced	
		6	Stator resistor identifies the input phase loss	
		7	Input phase loss of S4C	
9	Drive overheating	1	Drive overheating	1. Make sure whether the ambient temperature is too high. 2. Check whether the cooling fan operates correctly. 3. Check whether the cooling air duct is blocked. 4. Contact after-sales or manufacturer for technical support.
11	Detecting errors of current zero drift	1	Zero drift of phase U too high	UPM abnormality. Contact after-sales or manufacturer for technical support.
		2	Zero drift of phase V too high	
		3	Overcurrent in checking	
		4	Overvoltage in checking	
		2	Phase V overcurrent in case of short-circuit to ground	
		4	Phase W overcurrent in case of short-circuit to ground	
		5	Current of the short-circuit to ground exceeds the threshold	
6	Over voltage short-circuit to ground			
13	Tuning failed	1	Dynamic tuning association	1. Make sure whether the motor parameter parameters are set correctly. 2. Contact after-sales or manufacturer for technical support.
		2	Static tuning failed	
15	Warning of motor stall	1	Speed reversed due to external force	1. Make sure whether the motor parameter parameters are set correctly. 2. Make sure whether the motor parameter self-learning operation is carried out. 3. Check whether the parameter settings related to the stall are reasonable. 4. Contact after-sales or manufacturer for technical support.
		2	Excessive speed deviation	
17	Drive power fault	1	Voltage of drive power is low	Contact after-sales or manufacturer for technical support.

Index	Name of fault	Subcode of fault	Meaning of subcode	Countermeasures
21	Model setting error	1	Model exceeds upper limit	1. Confirm whether the drive model is consistent with the load. 2. Contact after-sales or manufacturer for technical support.
		2	Model exceeds lower limit	
23	Drive pre-overload of drive	1	Pre-warning of drive overload	1. Confirm the pre-overload function of the drive is on. 2. Contact after-sales or manufacturer for technical support.
24	Motor pre-overload	1	Pre-warning of motor overload	1. Confirm the pre-overload function of the drive is on. 2. Contact after-sales or manufacturer for technical support.
26	Communication exception	1	Exception disconnected when operation panel starts	1. Check whether the relevant communication cables of the drive are connected abnormally. 2. Check whether the communication limit parameters are set reasonably. 3. Contact after-sales or manufacturer for technical support.
		2	Exception disconnected when operation panel starts	
		3	Master communication fault	
27	Motor speed overrun	1	Motor speed exceeds the maximum speed limit	1. Check whether the parameters related to motor overspeed are set reasonably. 2. Contact after-sales or manufacturer for technical support.
28	Deviation of motor speed is too high	1	The deviation between the motor speed and the given speed is too high	1. Check whether the parameters related to the deviation of motor speed is set reasonably. 2. Contact after-sales or manufacturer for technical support.
40	PID feedback lost	1	PID sampling value lost	1. Check the input signal of PID feedback. 2. Contact after-sales or manufacturer for technical support.
41	External fault	1	Generating external fault 1	1. Check the external signal
43	Pre-disabled	1	The bus voltage is not detected when the run command is generated	1. Check whether the external power supply voltage is abnormal. 2. Contact after-sales or manufacturer for technical support.
46	Hold-brake control abnormally	1	Hold-brake coil abnormally	1. Check whether the external relay is abnormal. 2. Contact after-sales or manufacturer for technical support.
		2	Hold-brake coil abnormally	
51	Flash fault	1	Flash cannot be accessed	1. Power on again. 2. Check whether the frequency of modifying function code is too high. 3. Contact after-sales or manufacturer for technical support.
		2	Value of function code is not in the upper and lower limits	
		3	Readback error after flash writing	
		4	Function modification times exceed limit	

5 Function code

Function code	Name	Value scope	Default Value	Communication address
A00:Status Monitor and Set				0x2000
A00.00	Current state machine	50~530	0	0x2000
A00.01	Target Frequency	-327.68~327.67Hz	0	0x2001
A00.02	Given Frequency	-327.68~327.67Hz	0	0x2002
A00.03	Motor Frequency	-327.68~327.67Hz	0	0x2003
A00.04	Target speed	-32768~32767rpm	0	0x2004
A00.05	Given speed	-32768~32767rpm	0	0x2005
A00.06	Motor speed	-32768~32767rpm	0	0x2006
A00.07	Output voltage	0~1000V	0	0x2007
A00.08	Output current	0~655.35A	0	0x2008
A00.09	Output power	0~655.35kw	0	0x2009
A00.10	Given torque	-300.0~300.0%	0	0x200A
A00.11	Output torque	-300.0~300.0%	0	0x200B
A00.14	DC bus voltage	0~1000.0V	0	0x200E
A00.15	Radiator temperature	-40~150°	0	0x200F
A00.16	DI status	0~65535	0	0x2010
A00.17	DO status(System reservation)	0~65535	0	0x2011
A00.41	Power on display selection 1	0: Current state machine 1: Target frequency 2: Given frequency 3: Output frequency 4: Target speed 5: Given speed 6: Motor speed 7: Output voltage 8: Output current 9: Output power 10: Given torque 11: Output torque 12: System reservation 13: System reservation 14: DC bus voltage 15: Radiator temperature 16: DI status 17: DO status	1	0x2029
A00.42	Power on display selection 2	Ditto	3	0x202A
A00.43	Power on display selection 3	Ditto	8	0x202B
A00.44	Power on display selection 4	Ditto	11	0x202C
A00.45	Power on display selection 5	Ditto	14	0x202D
A00.46	Power on display selection 6	Ditto	15	0x202E

Function code	Name	Value scope	Default Value	Communication address
A01:Faults and Warnings				0x2100
A01.00	Current fault code 1	0~51	0	0x2100
A01.01	Sub-code of the fault code 1	0~65535	0	0x2101
A01.04	Current warning code 1	0~51	0	0x2104
A01.05	Sub-code of the warning code 1	0~65535	0	0x2105
A02 Drive Information and Set				0x2200
A02.00	Function Software Version	0.00~655.35	0	0x2200
A02.02	Performance Version number	0~65535	0	0x2202
A02.04	Rated power of PM power unit	0.00~655.35	0	0x2204
A02.05	Rated voltage of PM power unit	0~65535	0	0x2205
A02.06	Rated current of PM power unit	0.00~655.35	0	0x2206
A02.07	Function code version number	0.00~655.35	0	0x2207
A02.08	Version release time	0x0~0xFFFF	0	0x2208
A03 PM power Protect and Set				0x2300
A03.05	VU CUR DEV correction COEF	85.0%~115.0%	100	0x2305
A03.08	Carrier frequency setting	0.8~16.0kHz	4	0x2308
A03.09	Load mode selection	0: Light load 1: Heavy load	0	0x2309
A03.13	DPWM switching frequency	1.00Hz ~ 60.0Hz	8	0x230D
A03.16	Dead time compensation enable	0: Disable 1: Dead time compensation method1 2: Dead time compensation method2	1	0x2310
A03.19	Input phase loss detection	0: Disable 1: Enable	0	0x2313
A03.20	Braking resistance action point	600.0~800.0V	700	0x2314
A03.21	Software under-voltage point	60% ~ 150%	100	0x2315

Function code	Name	Value scope	Default Value	Communication address
A04: System and Environment Set				0x2400
A04.00	Parameter reset mode	0: Invalid 1: Model PARAM, motor PARAM are not reset 2: Motor PARAM is not reset 3: Reset All Parameters 4: Clear fault record	0	0x2400
A04.01	Parameter reset	0: Cancel 1: Confirm	0	0x2401
A04.02	Parameter access level	0: Standard parameter 1: Extended parameter 2: Expert parameter 3: Manufacturer parameter	0	0x2402
A04.03	Manufacturer password	0~65535	0	0x2403
A04.05	Motor select source	0: 00 1: 01 2~6: DI0~DI4 7~10: Reserved Others: Binary interconnection parameters	0	0x2405
A05: Digital Input				0x2500
A05.00	DI physical state value	0x0~0xFFFF	0x0	0x2500
A05.02	DI state value after treatment	0x0~0xFFFF	0x0	0x2502
A05.04	DI forced selection	0x0~0xFFFF	0x0	0x2504
A05.06	DI mandatory data	0x0~0xFFFF	0x0	0x2506
A05.08	DI0 opening delay	0.0~6553.5S	0	0x2508
A05.09	DI0 off delay	0.0~6553.5S	0	0x2509
A05.10	DI1 opening delay	0.0~6553.5S	0	0x250A
A05.11	DI1 off delay	0.0~6553.5S	0	0x250B
A05.12	DI2 opening delay	0.0~6553.5S	0	0x250C
A05.13	DI2 off delay	0.0~6553.5S	0	0x250D
A05.14	DI3 opening delay	0.0~6553.5S	0	0x250E
A05.15	DI3 off delay	0.0~6553.5S	0	0x250F
A05.16	DI4 opening delay	0.0~6553.5S	0	0x2510
A05.17	DI4 off delay	0.0~6553.5S	0	0x2511

Function code	Name	Value scope	Default Value	Communication address
A06: Digital Output				0x2600
A06.00	DO signal source status value	0x0~0xFFFF	0x0	0x2600
A06.01	Status value after DO process	0x0~0xFFFF	0x0	0x2601
A06.02	Output FUNC SEL of DO0 (relay)	0: Low level 1: High level 2: Running ready 3: Running allowed 4: Running 5: Comparison value reached 6: Reverse speed 7: Running at zero speed 8: Over speed 9: Warning 10: Fault Others: Binary interconnection parameters	4	0x2602
A06.03	Output FUNC SEL of DO1	Same as A06.02	10	0x2603
A06.09	DO0 (relay) on delay	0.0~6553.5S	0	0x2609
A06.10	DO0 (relay) turn-off delay	0.0~6553.5S	0	0x260A
A06.11	DO1 (transistor) turn-on delay	0.0~6553.5S	0	0x260B
A06.12	DO1 (transistor) turn-off delay	0.0~6553.5S	0	0x260C
A07: Analog Input				0x2700
A07.00	AI input values	0.000~10.000	0	0x2700
A07.01	AI input ratio	-600.0%~600.0%	0	0x2701
A07.02	Potentiometer input value	0.000~3.000	0	0x2702
A07.03	Potentiometer input ratio	-600.0%~600.0%	0	0x2703
A07.04	AI type	0: Reserved 1: 0~10V	1	0x2704
A07.06	AI curve minimum input value	0.000~10.000	0	0x2706
A07.07	AI curve minimum input ratio	-600.0%~600.0%	0	0x2707
A07.08	AI curve maximum input value	0.000~10.000	10	0x2708
A07.09	AI curve maximum input ratio	-600.0%~600.0%	100	0x2709
A07.10	Potentiometer Min input value	0.000~3.000	0.1	0x270A

Function code	Name	Value scope	Default Value	Communication address
A07:Analog Input				0x2700
A07.11	Potentiometer Min input ratio	-600.0% ~ 600.0%	0	0x270B
A07.12	Potentiometer Max input value	0.000 ~ 3.000	2.9	0x270C
A07.13	Potentiometer Max input ratio	-600.0% ~ 600.0%	100	0x270D
A07.14	AI below Min input setting SEL	00~11	0	0x270E
A07.15	AI filtering time	0~10000ms	10	0x270F
A07.16	Potentiometer filter time	0~10000ms	10	0x2710
A08:Analog Output				0x2800
A08.00	AO output value	0.00 ~ 20.00	0	0x2800
A08.01	AO output ratio	-600.0% ~ 600.0%	0	0x2801
A08.04	AO signal source	0:00 1: Motor speed 2: Synchronous frequency 3: Output current 4: Output torque 5: DC bus voltage 6: Output power 7: RFG input 8: RFG output 9: Speed reference 10: Reserved Others:Analog interconnection parameters	0	0x2804
A08.08	AO curve minimum output ratio	-600.0% ~ 600.0%	0	0x2808
A08.09	AO curve minimum output value	0.00 ~ 20.00	4	0x2809
A08.10	AO curve maximum output ratio	-600.0% ~ 600.0%	100	0x280A
A08.11	AO curve maximum output value	0.00 ~ 20.00	20	0x280B

Function code	Name	Value scope	Default Value	Communication address
B00:System Ctrl and Set				0x3000
B00.11	OFF3 source	0: Valid 1: Invalid 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	1	0x300B
B00.13	Fault reset source	0: Invalid 1: Valid 2~6:DI0~DI4 7~9:Reserved 10: Modbus fault reset Others:Binary interconnection parameters	0	0x300D
B00.21	Identification request	0: None 1: Simple static identification of asynchronous machine 2: Complete static identification of asynchronous machine 3: Dynamic complete identification of asynchronous machine	0	0x3015
B00.23	OFF1 shutdown mode	0: Coast to stop 1: Decelerate to stop	1	0x3017
B00.24	OFF3 downtime	0.0s ~ 1000.0s	10	0x3018
B01:Terminal control module				0x3100
B01.01	Start-stop Ctrl command mode	0: Invalid 1: IN1 start 2: IN1 start, IN2 direction 3: IN1 forward start, IN2 reverse start 4: IN1P start, IN2 stop 5: IN1P start, IN2 stop, IN3 direction 6: IN1P forward start, IN2P starts in reverse, IN3 stops	3	0x3101

Function code	Name	Value scope	Default Value	Communication address
B01:Terminal controlmodule				0x3100
B01.03	Start-stop Ctrl commandinput 1	0: Invalid 1: Reserved 2~6:DI0~DI4 7~9:Reserved 10: Modbusstart/stop command Others:Binary interconnection parameters	2	0x3103
B01.04	Start-stop Ctrl commandinput 2	0: Invalid 1: Reserved 2~6:DI0~DI4 7~9:Reserved 10: Modbusreverse start/stopcommand Others:Binary interconnection parameters	3	0x3104
B01.05	Start-stop Ctrl commandinput 3	0: Invalid 1: Reserved 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	4	0x3105
B01.11	JOG1 source	0: Invalid 1: Reserved 2~6:DI0~DI4 7~9:Reserved 10: Modbusjog command Others:Binary interconnection parameters	0	0x310B
B01.12	JOG2 source	0: Invalid 1: Reserved 2~6:DI0~DI4 7~9:Reserved 10: Modbusjog command Others:Binary interconnection parameters	0	0x310C

Function code	Name	Value scope	Default Value	Communication address
B02:CommandSourceSettings				0x3200
B02.00	SpeedCtrl main settingSEL	0:00 1: Multi-stageset value1 2: AI 3: Internalpotentiometer 4~5: Reserved 6: Multi-stagevalue given 7: Motorized potentiometer 8~9: Reserved 10: MB. setting Scaling unit value 1 Others:Analog interconnection parameters	1	0x3200
B02.01	SpeedCtrl AUX settingSEL	Ditto	0	0x3201
B02.02	Additional speed setting	Ditto	0	0x3202
B03:Others of CommandSRC Set				0x3300
B03.00	JOG1 given settings	0:00 1: Multi-stageset value1 2: AI 3: Internalpotentiometer 4~5: Reserved 6: Multi-stagevalue given 7: Motorized potentiometer 8~9: Reserved 10: MB. setting Scaling unit value 1 Others:Analog interconnection parameters	1	0x3300
B03.01	JOG2 given settings	Ditto	0	0x3301
B03.02	JOG acceleration time	0.0~1000.0S	10	0x3302
B03.03	JOG deceleration time	0.0~1000.0S	10	0x3303
B03.04	Electric potentiometer	0: Disable 1: Enable	1	0x3304
B03.05	Electric POT initial value	-600.0~600.0%	0	0x3305
B03.06	Electric POT ramp time	0.0~1000.0S	10	0x3306
B03.07	Minimum value of electric POT	-600.0~600.0%	0	0x3307

Function code	Name	Value scope	Default Value	Communication address
B03:Others of CommandSRC_Set				0x3300
B03.08	Maximum value of electric POT	-600.0~600.0%	100	0x3308
B03.09	Electric POT adds sourceSEL	0:00 1:01 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	0	0x3309
B03.10	SEL of dropSRC of ELEC POT	Ditto	0	0x330A
B03.11	Multisegmentgiven value	-600.0~600.0%	0	0x330B
B03.12	Multisegmentgiven valueSEL_1	0:00 1:01 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	0	0x330C
B03.13	Multisegmentgiven valueSEL_2	Ditto	0	0x330D
B03.14	Multisegmentgiven valueSEL_3	Ditto	0	0x330E
B03.16	Multisegmentset point1	-600.0~600.0%	10	0x3310
B03.17	Multisegmentset point2	-600.0~600.0%	20	0x3311
B03.18	Multisegmentset point3	-600.0~600.0%	30	0x3312
B03.19	Multisegmentset point4	-600.0~600.0%	-10	0x3313
B03.20	Multisegmentset point5	-600.0~600.0%	-20	0x3314
B03.21	Multisegmentset point6	-600.0~600.0%	-30	0x3315
B03.22	Multisegmentset point7	-600.0~600.0%	0	0x3316
B03.23	Multisegmentset point8	-600.0~600.0%	0	0x3317

Function code	Name	Value scope	Default Value	Communication address
B04-Ramp FunctionGenerator				0x3400
B04.00	RFG ramptime selection1	0: Invalid 1: Valid 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	0	0x3400
B04.01	RFG ramptime selection2	Ditto	0	0x3401
B04.02	Accelerationtimeof Slope1	0.0~1000.0S	5	0x3402
B04.03	Decelerationtimeof Slope1	0.0~1000.0S	5	0x3403
B04.04	Accelerationtimeof Slope2	0.0~1000.0S	5	0x3404
B04.05	Decelerationtimeof Slope2	0.0~1000.0S	5	0x3405
B04.06	Accelerationtimeof Slope3	0.0~1000.0S	5	0x3406
B04.07	Decelerationtimeof Slope3	0.0~1000.0S	5	0x3407
B04.08	Accelerationtimeof Slope4	0.0~1000.0S	5	0x3408
B04.09	Decelerationtimeof Slope4	0.0~1000.0S	5	0x3409
B04.10	Start time of S curve 1	0.00~20.00S	0	0x340A
B04.11	End time of S curve1	0.00~20.00S	0	0x340B
B04.12	Start time of S curve 2	0.00~20.00S	0	0x340C
B04.13	End time of S curve2	0.00~20.00S	0	0x340D
B04.14	Start time of S curve 3	0.00~20.00S	0	0x340E
B04.15	End time of S curve3	0.00~20.00S	0	0x340F
B04.16	Start time of S curve 4	0.00~20.00S	0	0x3410
B04.17	End time of S curve4	0.00~20.00S	0	0x3411

Function code	Name	Value scope	Default Value	Communication address
B05:Motor Control Selection				0x3500
B05.00	Motor control mode	0:VF 1:SVC	0	0x3500
B05.02	Positive speed allowed	0: Invalid 1: Valid 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	1	0x3502
B05.03	Negative speed allowed	Ditto	1	0x3503
B05.04	Motor starting mode	0: Direct start 1: Pre-excitation start 2: Speed tracking start 3: DC braking start	0	0x3504
B05.06	Pre-excitation time setting	0.00~100.00S	0	0x3506
B05.08	Setting of pre-excitation CUR	10.0% ~ 200.0% 100.0%Relative motor rated current	100	0x3508
B05.09	DC braking current	0.0% ~ 100.0% 100.0%Relative motor rated current	50	0x3509
B05.10	DC braking time at start-up	0.00s~100.00s	0	0x350A
B05.11	DC braking time during shutdown	0.00s~100.00s	0	0x350B
B05.12	DC braking INIT speed at stop	0 ~ 3000rpm	0	0x350C
B05.13	Speed tracking mode	0: Turn off speed tracking 1: Search from stop frequency 2: Search from rated frequency 3: Search from maximum frequency	0	0x350D
B05.14	Speed tracking search time	0.0~120.0S	25	0x350E
B05.15	Speed tracking CUR percentage	0~100%	50	0x350F
B05.16	Speed tracking MIN-FRQ limit	0.00~50.00Hz	2	0x3510
B05.17	Speed tracking switching time	0~6000ms	250	0x3511
B05.29	Zero speed judgment value	0 ~ 3000rpm	30	0x351D
B05.30	Zero speed shutdown delay time	0.00~100.00S	0	0x351E
B05.32	OFF1 shutdown mode	0: Coast to stop 1: Decelerate to stop	1	0x3520
B05.33	OFF3 downtime	0.0s ~ 1000.0s	10	0x3521

Function code	Name	Value scope	Default Value	Communication address
B06:Motor Limit and Protection				0x3600
B06.00	Lower limit of jump frequency 1	0.0%~300.0% 100.0%Relative to motor rated frequency	0	0x3600
B06.01	Upper limit of jump frequency 1	0.0%~300.0% 100.0%Relative to motor rated frequency	0	0x3601
B06.02	Lower limit of jump frequency 2	0.0%~300.0% 100.0%Relative to motor rated frequency	0	0x3602
B06.03	Upper limit of jump frequency 2	0.0%~300.0% 100.0%Relative to motor rated frequency	0	0x3603
B06.04	Forward limit speed	0.0%~300.0% 100.0%Relative to motor rated frequency	100	0x3604
B06.05	Reverse limit speed	-300.0%~0% 100.0%Relative to motor rated frequency	-100	0x3605
B06.12	Vector control torque limit	0.0%~200.0%	180	0x360C
B06.13	Torque limit before brake open	0.0%~200.0%	180	0x360D
B06.25	Motor overload PROT_FUNC	0: Prohibited 1: Allowed	0	0x3619
B06.26	Motor overload PROT_FUNC gain	20~1000%	100	0x361A
B06.28	Overspeed detection value	0.0% ~ 50.0% 100.0%Relative motor rated speed	20	0x361C
B06.29	Overspeed detection time	0.0S: No detection 0.1S ~ 60.0S	5	0x361D
B06.32	CV reaches detection value	0.0% ~ 300.0% 100.0%Relative motor rated speed	100	0x3620
B06.33	CV reaches detection lag value	0.0% ~ B06.32 100.0%Relative motor rated speed	3	0x3621
B06.34	CV reaches the detection time	0:0: No detection 0.1s ~ 300.0s	3	0x3622
B06.37	Output phase loss detection	0: Prohibited 1: Allowed	1	0x3625
B06.59	Stall detection time 1	0~5000ms	500	0x363B
B06.60	Stall detection time 2	0~5000ms	500	0x363C
B06.61	Vector or stall detector COEF 2	0~100%	20	0x363D
B06.62	SVC control mode	0: Control Mode 1 1: Control Mode 2 2: Control Mode 3	0	0x363E
B06.64	Vector Ctrl slip COMP COEF	50~200%	100	0x3640

Function code	Name	Value scope	Default Value	Communication address
B07:VF Control				0x3700
B07.00	VF modeselection	0: VF curve 1: VF separation	0	0x3700
B07.01	VF curveselection	0: Straight line VF 1: Multi-point VF 2: SquareV/F 3: 1.5 times V/F	0	0x3701
B07.02	Multipoint VF curve:FRQ_point1	0.0 ~ B07.04	2	0x3702
B07.03	Multipoint VF curve:Volt_point1	0.0 ~ B07.05	20	0x3703
B07.04	Multipoint VF curve:FRQ_point2	B07.02 ~ B07.06	20	0x3704
B07.05	Multipoint VF curve:Volt_point2	B07.03 ~ B07.07	152	0x3705
B07.06	Multipoint VF curve:FRQ_point3	B07.04 ~ D00.04	40	0x3706
B07.07	Multipoint VF curve:Volt_point3	B07.05 ~ D00.02	304	0x3707
B07.10	I _{max} control enablement	0: Invalid 1: Valid	1	0x370A
B07.11	I _{max} controlling FM gain	0 ~ 100	30	0x370B
B07.12	I _{max} inhibition point	0 ~ 200	150	0x370C
B07.13	VF torqueboosting mode	0: Disable 1: Manual 2: Automatic	1	0x370D
B07.15	VF manual torque boost	0% ~ 250%	1	0x370F
B07.16	VF torque lifting out-off FRQ	0.00~100.00Hz	50	0x3710
B07.17	VF slip compensator COEF	0.0% ~ 300.0%	0	0x3711
B07.20	VF oscillation suppression mode	0: Invalid 1: Valid	1	0x3714
B07.21	VF oscillation suppression gain	0 ~ 500%	10	0x3715
B07.24	VF over-excitation gain	0 ~ 200.0	0	0x3718
B07.28	V _{dc} max control switch	0: Disable 1: Enable	0	0x371C
B07.29	V _{dc} Max voltage margin	115%~150%	125	0x371D
B07.34	V _{dc} min control switch	0: Disable 1: Enable	0	0x3722
B07.35	V _{dc} min of Volt gain COEF	65~100	85	0x3723

Function code	Name	Value scope	Default Value	Communication address
B08:Speed Regulator				0x3800
B08.02	Speedloop low speedKp	0.0~100.0	10	0x3802
B08.03	Speedloop low speedTi	0.00~10.00ms	1	0x3803
B08.04	Speedloop high speedKp	0.0~100.0	10	0x3804
B08.05	Speedloop high speedTi	0.00~10.00ms	2	0x3805
B08.11	Speedloop switch low FRQ	0.00~40.00Hz	5	0x380B
B08.12	Speedloop switch high FRQ	0.00~40.00Hz	10	0x380C
B08.13	High FRQ CORR COEF	0.0~400.0%	100	0x380D
B08.26	EST speedloop filter time	0~10000ms	35	0x381A
B09:Current Regulator				0x3900
B09.04	Proportional COEF of current	1%~1000%	100	0x3904
B09.05	Integral COEF of current	1%~1000%	100	0x3905
B11:Motor Model and Others				0x3B00
B11.51	Monitoring channel1	0~65535	207	0x3B33
B11.52	Monitoring channel2	0~65535	209	0x3B34
B11.53	Monitoring channel3	0~65535	210	0x3B35
B11.54	Monitoring channel4	0~65535	211	0x3B36
B11.56	Maximum electric frequency	0~65535	1200	0x3B38
B11.57	Maximum generation frequency	0~65535	800	0x3B39
B11.75	Heavy load speed limit enable	0~65535	0	0x3B4B
B11.78	Reserved	0~65535	0	0x3B4E
B11.93	Interactive data monitor SEL_0	0~511	0	0x3B5D
B11.94	Interactive data monitor SEL_1	0~511	269	0x3B5E
B11.95	Interactive data monitor SEL_2	0~511	270	0x3B5F
B11.96	Interactive data monitor SEL_3	0~511	271	0x3B60

Function code	Name	Value scope	Default Value	Communication address
C02:ModbusCOM M SET				0x4200
C02.00	Modbusbaudrate	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps 6:57600bps 7:115200bps	7	0x4200
C02.01	Modbusdataformat	0:Even parity (8-E-1) 1:Oddparity (8-O-1) 2:no verification (8-N-2) 3:no verification (8-N-1)	3	0x4201
C02.02	Modbuslocal address	1~247	1	0x4202
C02.04	Modbus communication timeout	0:Invalid, 0.1s~60.0s	2	0x4204
C02.06	ModbusCOM M set point unit selection	0:Percentage 1:Frequency	0	0x4206
C02.07	Modbussaves written values	0:Updates 1:Not updates	0	0x4207
D00:Motor0 Basic PARAMs				0x5000
D00.00	Motor type selection	0: Induction motor 1: Permanent magnet synchronous motor (Reserved)	0	0x5000
D00.01	Motor rated power	0.00~655.35kW	0.55	0x5001
D00.02	Motor rated voltage	0~1500V	380	0x5002
D00.03	Motor rated current	0.00~655.35A	1.6	0x5003
D00.04	Motor rated frequency	0.0~600.00Hz	50	0x5004
D00.05	Motor rated speed	0~65535rpm	1330	0x5005
D00.06	Maximum motor speed	0.0%~300.0% Rated speed	100	0x5006
D00.07	Minimum motor speed	0.0%~300.0% Rated speed	0	0x5007
D00.08	Maximum motor current	0.0%~300.0% Rated current	100	0x5008
D00.09	Motor polar logarithm	Read-only	2	0x5009
D01:Motor0 Identified PARAMs				0x5100
D01.00	IM stator resistance	0.000~65.535ohm	14.477	0x5100
D01.01	IM rotor resistance	0.000~65.535ohm	8.469	0x5101
D01.02	IM leakage inductance	0.000~65.535mH	5.13	0x5102
D01.03	IM mutual inductance	0.0~6553.5mH	5.453	0x5103
D01.04	IM no-load CUR	0.00~655.35A	1.28	0x5104

Function code	Name	Value scope	Default Value	Communication address
D03:Motor1 Basic PARAMs				0x5300
D03.00	Motor type selection	0: Induction motor 1: Permanent magnet synchronous motor (Reserved)	0	0x5300
D03.01	Motor rated power	0.00~655.35kW	0.55	0x5301
D03.02	Motor rated voltage	0~1500V	380	0x5302
D03.03	Motor rated current	0.0~6553.5A	1.6	0x5303
D03.04	Motor rated frequency	0.0~600.00Hz	50	0x5304
D03.05	Motor rated speed	0~65535rpm	1330	0x5305
D03.06	Maximum motor speed	0.0%~300.0% Rated speed	100	0x5306
D03.07	Minimum motor speed	0.0%~300.0% Rated speed	0	0x5307
D03.08	Maximum motor current	0.0%~300.0% Rated current	100	0x5308
D03.09	Motor polar logarithm	Read-only	2	0x5309
D04:Motor1 Identified PARAMs				0x5400
D04.00	IM stator resistance	0.000~65.535ohm	14.477	0x5400
D04.01	IM rotor resistance	0.000~65.535ohm	8.469	0x5401
D04.02	IM leakage inductance	0.000~65.535mH	5.13	0x5402
D04.03	IM mutual inductance	0.0~6553.5mH	5.453	0x5403
D04.04	IM no-load CUR	0.00~655.35A	1.28	0x5404

Function code	Name	Value scope	Default Value	Communication address
E00:Fault Handling				0x6000
E00.00	External fault 1 source	0.Invalid 1.Reserved 2-6.DI0-DI4 7-10.Reserved Others:Binary interconnection parameters	0	0x6000
E00.10	Automatic fault reset function	0.Invalid 1.Valid	0	0x600A
E00.11	Fault reset times reset time	0.0-3600.0s	180	0x600B
E00.12	Fault reset interval	0.0-600.0s	30	0x600C
E00.13	Fault reset times	0-5	5	0x600D
E00.14	Non-resettable EXC code1	0-51	0	0x600E
E00.15	Non-resettable EXC code2	0-51	0	0x600F
E00.23	Restart FUNC. after AUTO reset	0.Invalid 1.Valid	0	0x6017
E00.24	Abnormal SRC. of restart allowed	0.Specified exception code allows restart 1.Specified exception code does not allow restart	0	0x6018
E00.25	Specified EXC code 1	0-51	0	0x6019
E00.26	Specified EXC code 2	0-51	0	0x601A
E00.36	EXC level MOD EXC code1	0-51	0	0x6024
E00.37	EXC level of EXC code1	0.Free stop 1.Reserved 2.Stop mode shutdown 3.warning 4.No exception handling	0	0x6025
E00.38	EXC level MOD EXC code2	0-51	0	0x6026
E00.39	EXC level of EXC code2	0.Free stop 1.Reserved 2.Stop mode shutdown 3.warning 4.No exception handling	0	0x6027

Function code	Name	Value scope	Default Value	Communication address
E01:Latest Faults and Records				0x6100
E01.00	Fault code1	0-51	0	0x6100
E01.01	Fault code1 subcode	0-16	0	0x6101
E01.02	Fault code2	0-51	0	0x6102
E01.03	Fault code2 subcode	0-16	0	0x6103
E01.12	Fault speed	-300.00-300.00Hz	0	0x610C
E01.13	Fault current	0.0-655.35A	0	0x610D
E01.14	Fault bus voltage	0.0-800.0V	0	0x610E
E01.15	Fault output torque	-300.0%-300.0%	0	0x610F
E01.18	Running time - hour	0-65535	0	0x6112
E01.19	Running time - second	0-65535	0	0x6113
E01.20	Power-on CRT - hour	0-65535	0	0x6114
E01.21	Power-on CRT - second	0-65535	0	0x6115
E01.22	Fault output voltage	0-6553.5V	0	0x6116
E01.23	Fault PM state word	0-65535	0x0	0x6117
E02:Previous Faults and Records				0x6200
E02.00	Fault code1	0-51	0	0x6200
E02.01	Fault code1 subcode	0-16	0	0x6201
E02.02	Fault code2	0-51	0	0x6202
E02.03	Fault code2 subcode	0-16	0	0x6203
E02.12	Fault speed	-300.00-300.00Hz	0	0x620C
E02.13	Fault current	0.0-6553.5A	0	0x620D
E02.14	Fault bus voltage	0.0-800.0V	0	0x620E
E02.15	Fault output torque	-300.0%-300.0%	0	0x620F
E02.18	Running time - hour	0-65535	0	0x6212
E02.19	Running time - second	0-65535	0	0x6213
E02.20	Power-on CRT - hour	0-65535	0	0x6214
E02.21	Power-on CRT - second	0-65535	0	0x6215
E02.22	Fault output voltage	0-6553.5V	0	0x6216
E02.23	Fault PM status word	0-65535	0x0	0x6217

Function code	Name	Value scope	Default Value	Communication address
E03:Pre-2 Faults and Records				0x6300
E03.00	Fault code1	0~51	0	0x6300
E03.01	Fault code1 subcode	0~16	0	0x6301
E03.02	Fault code2	0~51	0	0x6302
E03.03	Fault code2 subcode	0~16	0	0x6303
E03.12	Fault speed	-300.00~300.00Hz	0	0x630C
E03.13	Fault current	0.0~6553.5A	0	0x630D
E03.14	Fault DC-link voltage	0.0~800.0V	0	0x630E
E03.15	Fault bustorque	-300.0%~300.0%	0	0x630F
E03.18	Runningtime - hour	0~65535	0	0x6312
E03.19	Runningtime - second	0~65535	0	0x6313
E03.20	Power-on CRT - hour	0~65535	0	0x6314
E03.21	Power-on CRT - second	0~65535	0	0x6315
E03.22	Fault outputvoltage	0~6553.5V	0	0x6316
E03.23	Fault PM stateword	0~65535	0x0	0x6317
E04:Pre-3 Faults and Records				0x6400
E04.00	Fault code1	0~51	0	0x6400
E04.01	Fault code1 subcode	0~16	0	0x6401
E04.02	Fault code2	0~51	0	0x6402
E04.03	Fault code2 subcode	0~16	0	0x6403
E04.12	Fault speed	-300.00~300.00Hz	0	0x640C
E04.13	Fault current	0.0~6553.5A	0	0x640D
E04.14	Fault DC-link voltage	0.0~800.0V	0	0x640E
E04.15	Fault bustorque	-300.0%~300.0%	0	0x640F
E04.18	Runningtime - hour	0~65535	0	0x6412
E04.19	Runningtime - second	0~65535	0	0x6413
E04.20	Power-on CRT - hour	0~65535	0	0x6414
E04.21	Power-on CRT - second	0~65535	0	0x6415
E04.22	Fault outputvoltage	0~6553.5V	0	0x6416
E04.23	Fault PM stateword	0~65535	0x0	0x6417

Function code	Name	Value scope	Default Value	Communication address
E05:Pre-4 Faults and Records				0x6500
E05.00	Fault code1	0~51	0	0x6500
E05.01	Fault code1 subcode	0~16	0	0x6501
E05.02	Fault code2	0~51	0	0x6502
E05.03	Fault code2 subcode	0~16	0	0x6503
E05.12	Fault speed	-300.00~300.00Hz	0	0x650C
E05.13	Fault current	0.0~6553.5A	0	0x650D
E05.14	Fault DC-link voltage	0.0~800.0V	0	0x650E
E05.15	Fault bustorque	-300.0%~300.0%	0	0x650F
E05.18	Runningtime - hour	0~65535	0	0x6512
E05.19	Runningtime - second	0~65535	0	0x6513
E05.20	Power-on CRT - hour	0~65535	0	0x6514
E05.21	Power-on CRT - second	0~65535	0	0x6515
E05.22	Fault outputvoltage	0~6553.5V	0	0x6516
E05.23	Fault PM stateword	0~65535	0x0	0x6517
E06:Pre-5 Faults and Records				0x6600
E06.00	Fault code1	0~51	0	0x6600
E06.01	Fault code1 subcode	0~16	0	0x6601
E06.02	Fault code2	0~51	0	0x6602
E06.03	Fault code2 subcode	0~16	0	0x6603
E06.12	Fault speed	-300.00~300.00Hz	0	0x660C
E06.13	Fault current	0.0~6553.5A	0	0x660D
E06.14	Fault DC-link voltage	0.0~800.0V	0	0x660E
E06.15	Fault bustorque	-300.0%~300.0%	0	0x660F
E06.18	Runningtime - hour	0~65535	0	0x6612
E06.19	Runningtime - second	0~65535	0	0x6613
E06.20	Power-on CRT - hour	0~65535	0	0x6614
E06.21	Power-on CRT - second	0~65535	0	0x6615
E06.22	Fault outputvoltage	0~6553.5V	0	0x6616
E06.23	Fault PM stateword	0~65535	0x0	0x6617

Function code	Name	Value scope	Default Value	Communication address
F00:Logic operation module				0x7000
F00.00	Logic "AND" moduleA Input 1	0:Invalid other Binary interconnection parameters	0	0x7000
F00.01	Logic "AND" moduleA Input 2	Ditto	0	0x7001
F00.02	Logic "AND" moduleA Input 3	Ditto	0	0x7002
F00.03	Logic "AND" moduleA Input 4	Ditto	0	0x7003
F00.05	Logic "AND" moduleB Input 1	Ditto	0	0x7005
F00.06	Logic "AND" moduleB Input 2	Ditto	0	0x7006
F00.07	Logic "AND" moduleB Input 3	Ditto	0	0x7007
F00.08	Logic "AND" moduleB Input 4	Ditto	0	0x7008
F00.20	Logic "NOT" module A Input	Ditto	0	0x7014
F00.22	Logic "NOT" module B Input	Ditto	0	0x7016
F00.24	Logic "NOT" module C Input	Ditto	0	0x7018
F00.26	Logic "NOT" module D Input	Ditto	0	0x701A
F00.36	Logic "OR" module A Input 1	Ditto	0	0x7024
F00.37	Logic "OR" module A Input 2	Ditto	0	0x7025
F00.38	Logic "OR" module A Input 3	Ditto	0	0x7026
F00.39	Logic "OR" module A Input 4	Ditto	0	0x7027
F00.41	Logic "OR" module B Input 1	Ditto	0	0x7029
F00.42	Logic "OR" module B Input 2	Ditto	0	0x702A
F00.43	Logic "OR" module B Input 3	Ditto	0	0x702B
F00.44	Logic "OR" module B Input 4	Ditto	0	0x702C
F00.76	LDM A Input	Ditto	0	0x704C
F00.77	LDM A FUNC selection	0:ON delay 1:OFF delay 2:Doubleside delay	0	0x704D
F00.78	LDM A delay time	0-60000ms	0	0x704E
F00.79	LDM B Input	0:Invalid other Binary interconnection parameters	0	0x704F
F00.80	LDM B FUNC selection	0:ON delay 1:OFF delay 2:Doubleside delay	0	0x7050
F00.81	LDM B delay time	0-60000ms	0	0x7051

Function code	Name	Value scope	Default Value	Communication address
F01:Arithmetic Operation Module				0x7100
F01.00	ADD moduleA Input 1	0:00 Others:Analog interconnection parameters	0	0x7100
F01.01	ADD moduleA Input 2	Ditto	0	0x7101
F01.02	ADD moduleA Input 3	Ditto	0	0x7102
F01.03	ADD moduleA Input 4	Ditto	0	0x7103
F01.05	ADD moduleB Input 1	Ditto	0	0x7105
F01.06	ADD moduleB Input 2	Ditto	0	0x7106
F01.07	ADD moduleB Input 3	Ditto	0	0x7107
F01.08	ADD moduleB Input 4	Ditto	0	0x7108
F01.15	SUB moduleA input 1	Ditto	0	0x710F
F01.16	SUB moduleA input 2	Ditto	0	0x7110
F01.18	SUB moduleB input 1	Ditto	0	0x7112
F01.19	SUB moduleB input 2	Ditto	0	0x7113
F01.37	AVA moduleA Input	Ditto	0	0x7125
F01.39	AVA moduleB Input	Ditto	0	0x7127
F01.41	NCM moduleA Input 1	Ditto	0	0x7129
F01.42	NCM moduleA Input 2	Ditto	0	0x712A
F01.44	NCM moduleB Input 1	Ditto	0	0x712C
F01.45	NCM moduleB Input 2	Ditto	0	0x712D
F01.61	Data selectorA commandSRC 1	0:00 1:01 2-6:DI0-DI4 7-10:Reserved Other:Binary interconnection parameters	0	0x713D
F01.62	Data selectorA commandSRC 2	Ditto	0	0x713E

Function code	Name	Value scope	Default Value	Communication address
F01:Arithmetic Operation Module				0x7100
F01.63	Data selector A data source1	0:00 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4-5:Reserved 6:Multi-segment value given 7:Motorized Potentiometer 8-10:Reserved Others:Analog interconnection parameters	0	0x713F
F01.64	Data selector A data source2	Ditto	0	0x7140
F01.65	Data selector A data source3	Ditto	0	0x7141
F01.66	Data selector A data source4	Ditto	0	0x7142
F01.67	Data selector B command SRC 1	0:00 1:01 2-6:DI0-DI4 7-10:Reserved Other:Binary interconnection parameters	0	0x7143
F01.68	Data selector B command SRC 2	Ditto	0	0x7144
F01.69	Data selector B data source1	0:00 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4-5:Reserved 6:Multi-segment value given 7:Motorized Potentiometer 8-10:Reserved Others:Analog interconnection parameters	0	0x7145
F01.70	Data selector B data source2	Ditto	0	0x7146
F01.71	Data selector B data source3	Ditto	0	0x7147
F01.72	Data selector B data source4	Ditto	0	0x7148

Function code	Name	Value scope	Default Value	Communication address
F03:Process PID module				0x7300
F03.00	PID FUNC valid signal	0:Invalid 1:Reserved 2-6:DI0-DI4 7-10:Reserved Others:Binary interconnection parameters	0	0x7300
F03.01	PID operation enable signal	Ditto	0	0x7301
F03.02	PID action direction	0: Positive direction 1: Reverse direction	0	0x7302
F03.03	PID sampling calculation	1-20	2	0x7303
F03.04	PID given source	0:F03.05 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4-5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8-10:Reserved Others:Analog interconnection parameters	0	0x7304
F03.05	PID value setting	-600.0-600.0%	0	0x7305
F03.06	PID given freeze enable	0:Invalid 1:Reserved 2-6:DI0-DI4 7-10:Reserved Others:Binary interconnection parameters	0	0x7306
F03.07	PID given filtering time	0-60000ms	0	0x7307
F03.08	PID feedback source	0:00 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4-5:Reserved 6:Multi-segment value given 7:Motorized potentiometer 8-10:Reserved Others:Analog interconnection parameters	0	0x7308

Function code	Name	Value scope	Default Value	Communication address
F03:Process PID module				0x7300
F03.09	PID feedback filtering time	0~60000ms	0	0x7309
F03.10	PID DEV additional setting	Same as F03.08	0	0x730A
F03.11	Proportional gain KP	0.00~125.00	1	0x730B
F03.12	Proportional gain coefficient	0:100.0% 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4~5:Reserved 6:Multi-segment value given 7:Motorized Potentiometer 8~10:Reserved Others:Analog interconnection parameters	0	0x730C
F03.13	Integration time Ti	0~60000ms	10	0x730D
F03.14	Integral time coefficient	Same as F03.12	0	0x730E
F03.15	Differential time Td1	0~60000ms	0	0x730F
F03.16	Differential time coefficient	Same as F03.12	0	0x7310
F03.17	PID output integral INIT value	Same as F03.12	0	0x7311
F03.18	PID output additional setting	Same as F03.12	0	0x7312
F03.19	PID integral CMPT forced enable	0:Invalid 1:Reserved 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	0	0x7313
F03.20	PID integral CMPT forced value	0:100.0% 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4~5:Reserved 6:Multi-segment value given 7:Motorized Potentiometer 8~10:Reserved Others:Analog interconnection parameters	0	0x7314

Function code	Name	Value scope	Default Value	Communication address
F03:Process PID module				0x7300
F03.21	PID output limit	0.0~600.0%	100	0x7315
F03.22	PID output upper limit source	0:100.0% 1:Multi-segment setting value 1 2:AI 3:Potentiometer 4~5:Reserved 6:Multi-segment value given 7:Motorized Potentiometer 8~10:Reserved Others:Analog interconnection parameters	0	0x7316
F03.23	PID output lower limit source	Ditto	0	0x7317
F03.24	PID output limit rise/fall time	0.00~100.00S	0	0x7318
F03.25	PID deviation dead band enable	0:Forbidden 1:Enable	0	0x7319
F03.26	PID deviation dead band range	0.0~100.0%	0	0x731A
F03.27	PID FDBK missing test value	0.0~100.0%	0	0x731B
F03.28	PID FDBK loss test time	0.0~60.0S	0	0x731C
F04:Brake Control				0x7400
F04.00	Brake function selection	0: No brake 1: With brake without detection information 2: With brake detection information	0	0x7400
F04.04	Brake open command source	0:00 Others:Analog interconnection parameters	2311	0x7404
F04.05	Brake open comparison THR	0.0~200.0%	2	0x7405
F04.06	Holding brake open delay	0.00~10.00s	0	0x7406
F04.07	Brake closing speed THR	1.0~200.0%	1	0x7407
F04.08	Holding brake close delay	0.00~10.00s	0	0x7408
F04.10	Brake feedback point source	0:Invalid 1:Reserved 2~6:DI0~DI4 7~10:Reserved Others:Binary interconnection parameters	0	0x740A

Function code	Name	Value scope	Default Value	Communication address
F04:Brake Control				0x7400
F04.12	Brake close comparison source	0.00 Others:Analog interconnection parameters	2311	0x740C
F04.13	Brake open CURR comparison THR	0.0~200.0%	50	0x740D
F04.16	Brake opening speed pause time	0.00~10.00S	0.5	0x7410
F04.17	Brake closing speed pause time	0.00~10.00S	0.5	0x7411
F04.18	Restart brake control	0.No brake action 1.Brake action	1	0x7412
F04.19	Restart waiting time	0.00~10.00s	0.5	0x7413
P00:Hardware Status				0xE000
P00.00	Logic 0	0	0	0xE000
P00.01	Logic 1	1	1	0xE001
P00.02	Multifunctional DI0	0~1	0	0xE002
P00.03	Multifunctional DI1	0~1	0	0xE003
P00.04	Multifunctional DI2	0~1	0	0xE004
P00.05	Multifunctional DI3	0~1	0	0xE005
P00.06	Multifunctional DI4	0~1	0	0xE006
P00.10	Digital input DI0 inversion	0~1	0	0xE00A
P00.11	Digital input DI1 inversion	0~1	0	0xE00B
P00.12	Digital input DI2 inversion	0~1	0	0xE00C
P00.13	Digital input DI3 inversion	0~1	0	0xE00D
P00.14	Digital input DI4 inversion	0~1	0	0xE00E
P00.18	Multi-FUNC digital output DO0	0~1	0	0xE012
P00.19	Multi-FUNC digital output DO1	0~1	0	0xE013
P00.20	Multi-FUNC output DO0 INV	0~1	0	0xE014
P00.21	Multi-FUNC output DO1 INV	0~1	0	0xE015
P01:System Ctrl Words and State				0xE100
P01.00	Ready for startup	0~1	0	0xE100
P01.01	Ready for run	0~1	0	0xE101
P01.02	Run	0~1	0	0xE102
P01.03	Fault activation	0~1	0	0xE103
P01.06	Boot block	0~1	0	0xE106
P01.07	Alarm activate	0~1	0	0xE107
P01.09	Comparison value reached	0~1	0	0xE109
P01.11	System reservation	0~1	0	0xE10B
P01.12	Positive speed	0~1	0	0xE10C
P01.13	IGBT operation	0~1	0	0xE10D
P01.14	Jog operation valid	0~1	0	0xE10E

Function code	Name	Value scope	Default Value	Communication address
P01:System Ctrl Words and State				0xE100
P01.15	Pre-excitation start	0~1	0	0xE10F
P01.16	Open DC brake	0~1	0	0xE110
P01.20	Boot is not ready	0~1	0	0xE114
P01.21	Running is not ready	0~1	0	0xE115
P01.22	Not run	0~1	0	0xE116
P01.23	No fault	0~1	0	0xE117
P01.26	Boot is not blocked	0~1	0	0xE11A
P01.27	No alarm/Light fault	0~1	0	0xE11B
P01.29	Comparison value not reach	0~1	0	0xE11D
P01.31	System reservation	0~1	0	0xE11F
P01.32	Negative speed	0~1	0	0xE120
P01.33	IGBT blockade	0~1	0	0xE121
P01.34	Inching not in effect	0~1	0	0xE122
P01.35	Preexcitation complete	0~1	0	0xE123
P01.36	DC brake end	0~1	0	0xE124
P01.44	RFG acceleration	0~1	0	0xE12C
P01.45	RFG deceleration	0~1	0	0xE12D
P01.46	RFG constant speed	0~1	0	0xE12E
P01.58	System reservation	0~1	0	0xE13A
P01.59	System reservation	0~1	0	0xE13B
P01.60	System reservation	0~1	0	0xE13C
P01.61	System reservation	0~1	0	0xE13D
P01.62	Motor pre-overload state	0~1	0	0xE13E
P01.63	Zero speed given operation	0~1	0	0xE13F
P01.64	DC bus live mark	0~1	0	0xE140
P01.65	Motor speed is zero	0~1	0	0xE141
P01.66	PID function effective	0~1	0	0xE142
P01.67	PID operation enable	0~1	0	0xE143
P01.68	PID action direction	0~1	0	0xE144
P01.69	PID given freeze enable	0~1	0	0xE145
P01.70	Forced enable of PID integral	0~1	0	0xE146
P01.71	PID deviation dead band enable	0~1	0	0xE147
P01.72	PID saturation state	0~1	0	0xE148
P01.73	Motor over TEMP protection mark	0~1	0	0xE149
P01.74	Motor over TEMP warning sign	0~1	0	0xE14A
P01.75	Motor selection bit0	0~1	0	0xE14B

Function code	Name	Value scope	Default Value	Communication address
P01: System Ctrl Words and State				0xE100
P01.77	RFG select bit0	0~1	0	0xE14D
P01.78	RFG select bit1	0~1	0	0xE14E
P01.79	Multi-segment given value SEL 1	0~1	0	0xE14F
P01.80	Multi-segment given value SEL 2	0~1	0	0xE150
P01.81	Multi-segment given value SEL 3	0~1	0	0xE151
P01.84	System reservation	0~1	0	0xE154
P01.85	RFG operation flag	0~1	0	0xE155
P02: FBA and Fault Flag				0xE200
P02.32	Modbus COMM start-stop command	0~1	0	0xE220
P02.33	Modbus COMM inching start-stop	0~1	0	0xE221
P02.35	Modbus COMM fault reset	0~1	0	0xE223
P02.36	Modbus COMM run in reverse	0~1	0	0xE223
P03: Free Function 1				0xE300
P03.00	Logic "AND" module A output	0~1	0	0xE300
P03.01	Logic "AND" module B output	0~1	0	0xE301
P03.04	Logic "NOT" module A output	0~1	0	0xE304
P03.05	Logic "NOT" module B output	0~1	0	0xE305
P03.06	Logic "NOT" module C output	0~1	0	0xE306
P03.07	Logic "NOT" module D output	0~1	0	0xE307
P03.12	Logic "OR" module A output	0~1	0	0xE30C
P03.13	Logic "OR" module B output	0~1	0	0xE30D
P03.20	Logic delay module A output	0~1	0	0xE314
P03.21	Logic delay module B output	0~1	0	0xE315
P03.24	Comparison module A larger flag	0~1	0	0xE318
P03.25	Comparison module A equals flag	0~1	0	0xE319
P03.26	Comparison module A less flag	0~1	0	0xE31A
P03.27	Comparison module B larger flag	0~1	0	0xE31B

Function code	Name	Value scope	Default Value	Communication address
P03: Free Function 1				0xE300
P03.28	Comparison module B equals flag	0~1	0	0xE31C
P03.29	Comparison module B less flag	0~1	0	0xE31D
P03.32	Symbol of ABS module A input	0~1	0	0xE320
P03.33	Symbol of ABS module B input	0~1	0	0xE321
P03.34	Overflow flag: absolute value A	0~1	0	0xE322
P03.35	Overflow flag: absolute value B	0~1	0	0xE323
P03.36	Overflow flag: addition A	0~1	0	0xE324
P03.37	Overflow flag: addition B	0~1	0	0xE325
P03.39	Overflow flag: subtraction A	0~1	0	0xE327
P03.40	Overflow flag: subtraction B	0~1	0	0xE328
P06: State and Peripheral				0xE600
P06.00	Current state machine	0~65535	0	0xE600
P06.01	Target frequency	0~65535	0	0xE601
P06.02	Given frequency	0~65535	0	0xE602
P06.03	Output frequency	0~65535	0	0xE603
P06.04	Target speed	0~65535	0	0xE604
P06.05	Given speed	0~65535	0	0xE605
P06.06	Motor speed	0~65535	0	0xE606
P06.07	Output voltage	0~65535	0	0xE607
P06.08	Output current	0~65535	0	0xE608
P06.09	Output power	0~65535	0	0xE609
P06.10	Given torque	0~65535	0	0xE60A
P06.11	Output torque	0~65535	0	0xE60B
P06.12	Torque current	0~65535	0	0xE60C
P06.13	Excitation current	0~65535	0	0xE60D
P06.14	Radiator temperature	0~65535	0	0xE60E
P06.15	Encoder feedback frequency	0~65535	0	0xE60F
P06.30	Analog input A: conversion	0~65535	0	0xE61E
P06.31	Potentiometer input	0~65535	0	0xE61F
P06.34	Control board AO output value	0~65535	0	0xE622

Function code	Name	Value scope	Default Value	Communication address
P07:Communication				0xE700
P07.32	Modbus control command	0	0	0xE720
P07.33	Modbus COMM setting value 1	0	0	0xE721
P07.34	Modbus COMM setting value 1	0	0	0xE722
P07.35	Modbus COMM setting value 1 P.U	0	0	0xE723
P07.36	Modbus COMM setting value 1 P.U	0	0	0xE724
P08:Free Function Module				0xE800
P08.00	ADD module A output	0~65535	0	0xE800
P08.01	ADD module B output	0~65535	0	0xE801
P08.04	SUB module A output	0~65535	0	0xE804
P08.05	SUB module B output	0~65535	0	0xE805
P08.24	AVA module A output	0~65535	0	0xE818
P08.25	AVA module B output	0~65535	0	0xE819
P08.41	Data selector A output	0~65535	0	0xE829
P08.42	Data selector B output	0~65535	0	0xE82A
P09:Technology Utilization				0xE900
P09.00	PROC PID output(after clipping)	0~65535	0	0xE900
P09.01	PROC PID output(pre-clipping)	0~65535	0	0xE901
P09.02	Process PID proportional output	0~65535	0	0xE902
P09.03	Process PID integral output	0~65535	0	0xE903
P09.04	Process PID differential output	0~65535	0	0xE904
P09.05	Process PID given value	0~65535	0	0xE905
P09.06	Process PID feedback value	0~65535	0	0xE906
P09.07	Process PID deviation value	0~65535	0	0xE907
P09.08	Process PID DEV before added	0~65535	0	0xE908

Function code	Name	Value scope	Default Value	Communication address
P10:PM Internal Variables				0xEA00
P10.00	Given current of Axis M	0~65535	0	0xEA00
P10.01	Feedback current of Axis M	0~65535	0	0xEA01
P10.02	Given current of Axis T	0~65535	0	0xEA02
P10.03	Feedback current of Axis T	0~65535	0	0xEA03
P10.04	Given frequency	0~65535	0	0xEA04
P10.05	Feedback frequency	0~65535	0	0xEA05
P10.06	Synchronous frequency	0~65535	0	0xEA06
P10.07	Encoder frequency	0~65535	0	0xEA07
P10.08	PM monitoring variable 8	0~65535	0	0xEA08
P10.09	PM monitoring variable 9	0~65535	0	0xEA09
P10.10	Given voltage of Axis M	0~65535	0	0xEA0A
P10.11	Given voltage of Axis T	0~65535	0	0xEA0B
P10.12	PM monitoring variable 12	0~65535	0	0xEA0C
P10.13	PM monitoring variable 13	0~65535	0	0xEA0D
P10.14	PM monitoring variable 14	0~65535	0	0xEA0E
P10.15	PM monitoring variable 15	0~65535	0	0xEA0F
P10.16	PM monitoring variable 16	0~65535	0	0xEA10
P10.17	PM monitoring variable 17	0~65535	0	0xEA11
P10.18	PM monitoring variable 18	0~65535	0	0xEA12
P10.19	CRC check count	0~65535	0	0xEA13
P10.20	PM monitoring variable 20	0~65535	0	0xEA14
P10.21	PM monitoring variable 21	0~65535	0	0xEA15
P10.22	PM monitoring variable 22	0~65535	0	0xEA16

Function code	Name	Value scope	Default Value	Communication address
P10:PM Internal Variables				0xEA00
P10.23	PM monitoring variable 23	0~65535	0	0xEA17
P10.24	PM monitoring variable 24	0~65535	0	0xEA18
P10.25	PM monitoring variable 25	0~65535	0	0xEA19
P10.26	Monitoring channel 1	0~65535	0	0xEA1A
P10.27	Monitoring channel 2	0~65535	0	0xEA1B
P10.28	Monitoring channel 3	0~65535	0	0xEA1C
P10.29	Monitoring channel 4	0~65535	0	0xEA1D
P10.30	PM monitoring variable 30	0~65535	0	0xEA1E
P10.31	PM monitoring variable 31	0~65535	0	0xEA1F
P10.32	State machine	0~65535	0	0xEA20
P10.33	U phase current	0~65535	0	0xEA21
P10.34	V phase current	0~65535	0	0xEA22
P11:CM Content Variables				0xEB00
P11.00	Fixed value 0%	0~65535	0	0xEB00
P11.01	Fixed value 100%	0~65535	0	0xEB01
P11.02	Fixed value 200%	0~65535	0	0xEB02
P11.03	Fixed value 400%	0~65535	0	0xEB03
P11.04	Fixed value 600%	0~65535	0	0xEB04
P11.05	Fixed value -100%	0~65535	0	0xEB05
P11.06	Fixed value -200%	0~65535	0	0xEB06
P11.07	Fixed value -400%	0~65535	0	0xEB07
P11.08	Fixed value -600%	0~65535	0	0xEB08

Function code	Name	Value scope	Default Value	Communication address
P13: System Setting and				0xED00
P13.00	Motor actual speed	0~65535	0	0xED00
P13.01	Motor final set speed	0~65535	0	0xED01
P13.02	Main speed given	0~65535	0	0xED02
P13.03	Auxiliary speed given	0~65535	0	0xED03
P13.04	A given value of velocity	0~65535	0	0xED04
P13.05	Speed given before limiting	0~65535	0	0xED05
P13.06	Speed given after limiting	0~65535	0	0xED06
P13.07	Speed given after minimum limit	0~65535	0	0xED07
P13.08	RFG input speed given	0~65535	0	0xED08
P13.09	RFG output speed given	0~65535	0	0xED09
P13.10	Additional speed given	0~65535	0	0xED0A
P13.11	CM given speed	0~65535	0	0xED0B
P13.12	RFG module input value	0~65535	0	0xED0C
P13.13	Low number of motor turns	0~65535	0	0xED0D
P13.14	High number of motor turns	0~65535	0	0xED0E
P13.15	Positive maximum speed	0~65535	0	0xED0F
P13.16	Reverse maximum speed	0~65535	0	0xED10
P13.22	Motorized potentiometer output	0~65535	0	0xED16
P13.23	Multi segment given SEL output	0~65535	0	0xED17
P13.24	Multi segment setting value 1	0~65535	0	0xED18
P13.25	Multi segment setting value 2	0~65535	0	0xED19
P13.26	Multi segment setting value 3	0~65535	0	0xED1A
P13.27	Multi segment setting value 4	0~65535	0	0xED1B
P13.28	Multi segment setting value 5	0~65535	0	0xED1C
P13.29	Multi segment setting value 6	0~65535	0	0xED1D
P13.30	Multi segment setting value 7	0~65535	0	0xED1E
P13.31	Multi segment setting value 8	0~65535	0	0xED1F

6. Modbus-RTU protocol

REXON DRIVE AM series drives use standard RS485 communication interface and Modbus communication protocol, which supports serial communication between the drive and host computer or PLC. The communication protocol of AM series drives contains three levels: physical layer, data link layer and application layer. The physical layer and the data link layer adopt the RS485-based Modbus protocol, and the application layer includes various operation methods such as controlling the operation, stopping, parameter reading and writing of the AM series drive.

The Modbus protocol is a slave-master protocol. There are two types of communication between the master and the slave: the master requests and the slave responds; the master broadcasts and the slave does not respond. Only one device on the bus is sending at any time. The master polls the slave, and the slave cannot send a message without obtaining the command from the master. The host can repeat the command when the communication is incorrect. If it does not receive a response within a given time, it is considered that the polled slave is lost. If the slave cannot execute a message, it sends an exception message to the master. There is no direct communication between slaves, and the data of one slave must be read out through the software of the master, and then sent to another slave. The range of the slave address is 0 to 247, and the message with address 0 is a broadcast message.

6.1 RTU data frame

In RTU mode, RTU data frame is composed by multiple character frames. The data format and transmission order of each character frame are: 1 start bit + 8 data bits (low bits are transmitted first) + 1 parity bit or no parity bit + 1 or 2 stop bits.

In RTU mode, a new frame always starts with a silent transmission time of at least 3.5 character frames, that is, there must be at least 3.5 character frame transmission time between every two RTU data frames.



The information of a frame must be transmitted in a continuous data stream. If there is an interval of more than 1.5 character frames before the end of the entire frame transmission, the receiving device will clear these incomplete information and mistakenly believe that the next character frame is new. The address field part of a frame, similarly, if the interval between the start of a new frame and the previous frame is less than 3.5 character frame time. The receiving device will consider it to be the continuation of the previous frame. Due to the frame's disorder, the final CRC check value is incorrect, leading to communication failures.

AM series drives support Modbus protocol in RTU (Remote Terminal Unit) mode. The Modbus function codes supported by AM series drives are as follows:

Description of command code and communication data

Function code	Meaning	Broadcast	Maximum number	Explanation
03H	Read multiple registers	NO	5	
06H	Write single register	Yes	1	
10H	Write multiple registers	Yes	5	

6.2 Modbus command code

Command code: 03H

Function code 03H, read N words (Word, 16bit data), up to 16 words can be read continuously. For example: The drive with the slave address of 0x01, read the target speed of the motor, the given speed, the current motor speed, the Modbus logic starting address is 0x2004, and read 3 consecutive words, then the structure of the frame is described as follows:

Host request frame information

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x03
address high-bit	0x20
address low-bit	0x04
Read number high-bit	0x00
Read number low-bit	0x03
CRC low-bit	0x4F
CRC high-bit	0xCA

Slave response normally

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x03
Pitch number of return data	0x06
First data high-bit	0x05
First data low-bit	0xDC
Second data high-bit	0x00
Second data low-bit	0x00
Nth data high-bit	0x00
Nth data low-bit	0x00
CRC low-bit	0XX
CRC high-bit	0XX

Drive reply data bit: motor target speed 0X05DC(1500rpm), set speed 0x0000, current motor speed 0x0000

Slave response abnormally

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x83
Error code	0x02
CRC low-bit	0x99
CRC high-bit	0x2A

Command code: 06H

Write a word (Word)

For example: The drive with the slave address of 0x01, set the target speed of the drive to 100%, that is, write 0x03E8 to the Modbus logical address 0xE721, then the structure of the frame is described as follows:

RTU host request frame information:

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x06
Address high-bit	0xE7
Address low-bit	0x21
Data high-bit	0x03
Data low-bit	0xE8
CRC low-bit	0xEF
CRC high-bit	0xCA

Slave response normally

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x06
Address high-bit	0xE7
Address low-bit	0x21
Data high-bit	0x03
Data low-bit	0xE8
CRC low-bit	0xEF
CRC high-bit	0xCA

Slave response abnormally

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0xB6
Error code	0x03
CRC low-bit	0x02
CRC high-bit	0x61

Command code: 10H

Write N words (Word)

For example: The drive with the slave address of 0x01, write 3 data to the address 0x3500. Then the structure of the frame is described as follows:

RTU host request frame information:

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x10
Address high-bit	0x35
Address low-bit	0x00
Writing number high-bit	0x00
Writing number low-bit	0x03
Total number of write bytes	0x06
First data high-bit	0x00
First data low-bit	0x01
.....
Nth data high-bit	
Nth data low-bit	
CRC low-bit	0xFF
CRC high-bit	0xFF

Slave response normally

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x10
Address high-bit	0x35
Address low-bit	0x00
Data high-bit	0x00
Data low-bit	0x03
CRC low-bit	0x8F
CRC high-bit	0xC4

Slave response abnormally

START	T1-T2-T3-T4
Slave address	0x01
Modbus function code	0x90
Error code	0x03
CRC low-bit	0x0C
CRC high-bit	0x01

Exception code

When the function requested by the Modbus-RTU frame is incorrect, the driver will return an exception code.

Code	Name	Meaning
1	Illegal function code	Unsupported function code received
2	Illegal address	The requested register address is illegal, or the combination of the register address and the number of requested read data is illegal
3	Illegal data value	The received data field contains at least one illegal data value
4	Number of illegally requested data	The number of requested data is greater than the maximum number
5	Read only	Read only
6	Modify only during shutdown	Modify only during shutdown

6.3 Error checking of communication frame

Using the RTU frame format, the frame includes a frame error detection field calculated based on the CRC method. The CRC field detects the content of the entire frame. The CRC field is two bytes and contains a 1-bit binary value. It is added to the frame after being calculated by the transmission equipment. The receiving device recalculates the CRC of the received frame, and compares it with the value in the received CRC field. If the two CRC values are not equal, it means that there is an error in the transmission. CRC is first stored in 0xFFFF, and then a process is called to process more than 6 consecutive bytes in the frame with the value in the current register. Only the 8Bit data in each character is valid for CRC, and the start bit, stop bit and parity bit are invalid. In the process of CRC generation, each 8-bit character is individually exclusive OR (XOR) with the contents of the register, and the result moves to the direction of the least significant bit, and the most significant bit is filled with 0. The LSB is extracted for detection. If the LSB is 1, the register alone is XORed with the preset value. If the LSB is 0, it is not performed. The whole process should be repeated 8 times. After the last bit (the 8th bit) is completed, the next 8-bit byte is XORed separately with the current value of the register. The value in the final register is the CRC value after all bytes in the frame are executed. For example, it is necessary to transmit "11001110", the data contains 5 '1's, if we use the even parity, the result of even parity bit we will get '1'. If not, the result of odd parity we will get '0'. When transmitting the data, the parity bit should be calculated and placed in the frame's parity bit position, and the receiving device must also perform parity check. If the parity of the received data is found to be inconsistent with the preset, it is considered that a communication error has occurred. This CRC calculation method uses the international standard CRC check rule. When editing the CRC algorithm, the user can refer to the CRC algorithm of the relevant standard and write a CRC calculation program that truly meets the requirements.

Standard: CRC-16(MODBUS)

Polynomial: $x^{16}+x^{15}+x^2+1(0x8501)$

CRC initial value: 0xFFFF

Now provide a simple function of CRC calculation for user reference (program in C language):

```

unsigned int crc_cal_value(unsigned char *data_value,
    unsigned char data_length)
{
    int i;
    unsigned int crc_value = 0xffff;
    while(data_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;
}

```

6.4 Modbus related function codes

Before using the Modbus function, you need to set the Modbus configuration parameters of the function code CO2 group first, or use it according to the factory value.

Function code	Name	Value state	Value default	Communication address
Group CO2: communication settings				
CO2.00	Modbus Baud rate	0 ~ 7	7	0x4200
CO2.01	Modbus Data Format	0 ~ 3	2	0x4201
CO2.02	Modbus Local address	1 ~ 247	1	0x4202
CO2.04	Modbus Communication timeout	0.0:Null and void; 0.1s ~ 60.0s	2	0x4204
Group PO2: Binary interconnection parameters (system control word and status)				
P02.32	Modbus Communication stop command	0 ~ 1	0	0xE220
P02.33	Modbus Communication jog stop	0 ~ 1	0	0xE221
P02.35	Modbus Communication fault reset	0 ~ 1	0	0xE223
Group P07: Analog interconnection parameters (communication)				
P07.32	Control command	0	0	0xE720
P07.33	Communication settings 1	0	0	0xE721
P07.34	Communication settings 2	0	0	0xE722
P07.35	per unit of Communication settings 1	0	0	0xE723
P07.36	per unit of Communication settings 1	0	0	0xE724

6.5 Modbus Control command table

Modbus control command p07.32 is the special control command of Modbus of the driver, and changing the control command will synchronously update the Modbus control status flag bit in the P02 group. The Modbus control commands list is as follows:

P07.32 Numerical value	Flag bit	Function description	Modbus-RTU frame
0x0001	P02.32=1	Run start	01 06 E7 20 00 01 7F 74
0x0002	P02.33=1	Jog run	01 06 E7 20 00 02 3F 75
0x0004	P02.32=0, P02.33=0	Deceleration shutdown	0 06 E7 20 00 04 BF 77
0x0005	P02.32=0, P02.33=0, P02.35=1	Fault reset	01 06 E7 20 00 05 7E B7
other	P02.32=0, P02.33=0, P02.35=0	Reset parameters	01 06 E7 20 00 06 3E B6

6.6. Example of controlling motor start-stop and speed setting

Function code settings

1. Communication related parameter settings

Function code number	Function code name	Setting value	Description
02.00	Modbus Baud rate	7.1 15200bps	
02.01	Modbus Data format	3.8 -N-1	
02.02	Modbus Local address	1	
02.04	Modbus Communication timeout	2	The interval between host sending request frames shall not exceed two seconds

2. Start-stop command

Function code number	Function code name	Setting value	Description
301.01	Start-stop command mode	2: IN1 Start, IN2 Direction	
301.03	Start-stop command input IN1	10: Modbus start-stop command or interconnect parameters to P02.32	The start method is derived from Modbus's start-stop signals
301.04	Start and stop command enter IN2	10: Modbus reverse start and stop command or interconnect parameters to P02.36	The direction control is derived from the direction identifier of Modbus

3. JOG source

Function code number	Function code name	Setting value	Description
301.11	Source of terminal control mode JOG1	10: Modbus jogging command or interconnect parameters to P02.33	Select Jog 1 from the start-stop signal of Modbus

4. Source of error reset

Function code number	Function code name	Setting value	Description
300.13	Source of error reset	10: Modbus error reset or interconnect parameters to P02.35	Select the fault reset to come from the control fault reset flag of Modbus

5. Speed source

Function code number	Function code name	Setting value	Description
002.00	Selection of Speed control main setting	10: Modbus speed set value 1 or interconnect parameters to P02.36	The selected speed is derived from the set value of Modbus

6. Speed feedback

Function code number	Function code name	Description
400.03	Output frequency	Feed to feedback current output frequency of motor

After setting the function code parameters, monitoring and controlling of the drive are realized through Modbus read and write commands.

Modbus-RTU frame setting

Basic control of the drive can be realized by writing function codes P07.32 (0xE720) and P07.33 (0xE721)/P07.34 (0xE722). If the C02.04 communication timeout value is set, the host needs to send the request cyclically; and the cycle interval should be lower than the value in C02.04.

Note: Do not use the writing commands of Modbus to write function codes frequently other than P07.32-P07.34, otherwise it may cause non-volatile memory damage and system error.

1. start-stop

The master station sends a request: 01 06 E7 20 00 01 7F 74 start (motor start requires a rising edge signal, you can send the reset command 01 06 E7 20 00 05 7E B7).

The master station sends a request: 01 06 E7 20 00 01 7F 74 stop.

2. JOG

The master sends a request: 01 06 E7 20 00 02 3F 75 Jog starts.

4. Normal shutdown

The master sends a request:

5. Error reset

The master sends a request:

6. Set speed

Set the value of P07.33 function code to control the motor speed. The corresponding configuration is as follows:

Target speed	P07.33	Modbus-RTU Request frame
100%	1000	01 06 E7 21 03 E8 EF CA
50%	500	01 06 E7 21 01 F4 EF 63
0%	0	01 06 E7 21 00 00 EF 74
-50%	-500	01 06 E7 21 FE 0C AF 11
-100%	-1000	01 06 E7 21 FC 16 AE 7E

7. Speed read

The host sends a request: 01 03 20 03 00 01 7F CA, and the slave responds with 01 03 02 XX XX YY YY, where XX XX is the output frequency.

