AV20 HIGH PERFORMANCE VECTOR FREQUENCY TRANSFORMER

AV20 HIGH PERFORMANCE VECTOR FREQUENCY TRANSFORMER

Content

Chapter 1 Introduction

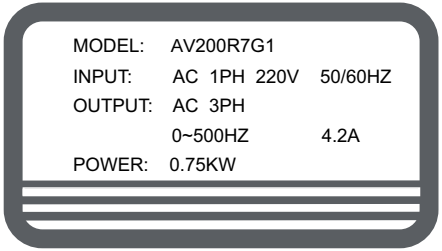
Thank you for your choice AV20 series high performance, simple and easy type frequency transformer

The diagrams of this operating instruction is convenient to explain, the content in this specification will alter in time because product update or specification change, and improve the convenience and accuracy of specification, please understand that we not inform specially.

Please attention to delivery this practice manual to end users and safety keep it, convenient for future check, repair, maintain and use.

Please contact our company or agent office of our company in tome if have any questions, we will do best to service for you.

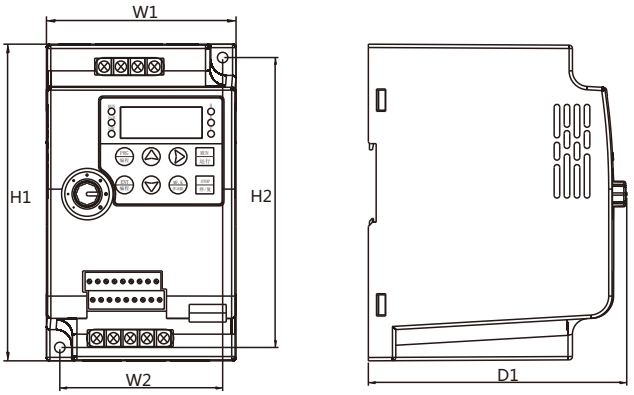
Chapter 2 Data plate instruction.



Model : AV20 0 0R7G 1

- 1 : Voltage grade : 1 : AC200V input; 3 : AC380V input
- 0R7G : Power : 0.75KW
- 0 : Configuration : 0 : standard; 1 : Special
- AV20 : S20 series frequency transformer

Chapter 3 Profile size

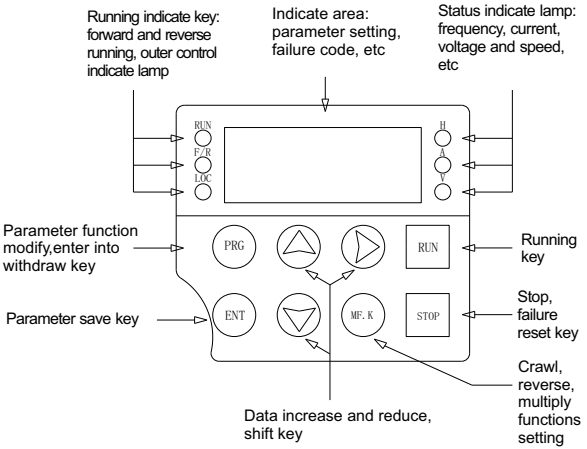


Frequency transformer specification	W1	H1	D1	W2	H2	Installation hole diameter
0.75-2.2KW/380V	85	142	116	73	130	4
0.4-1.5KW/220V						
4 -5.5KW/380V	95.5	180	120. 5	83	168	4
2.2 - 4KW/220V						
7.5- 11KW/380V	106.5	240.5	150.5	96	230	4
5.5-7.5KW/220V						

Attention: support standard 35mm guide rail. Unit: mm

Chapter 4 Keys instruction

Keys instruction

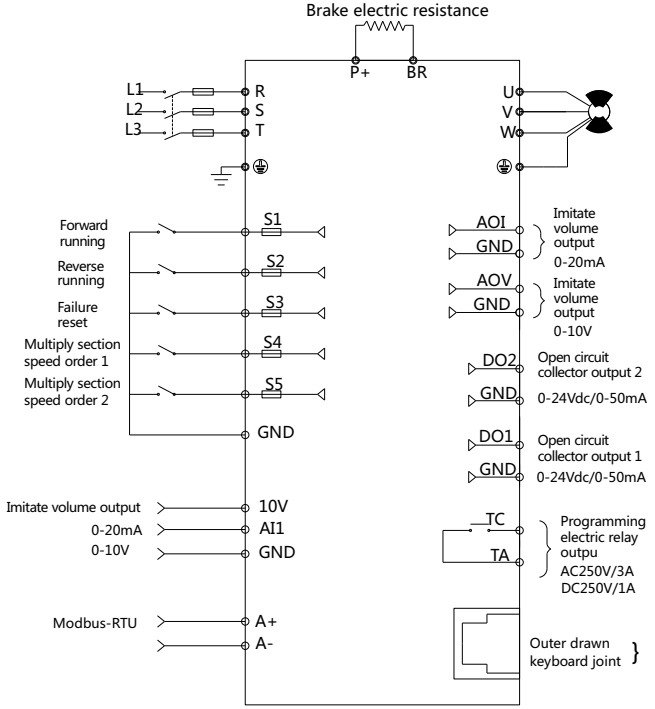


Chapter 5 Technical specification and index

Technical specification

Frequency transformer model	Electric capacitor volume KVA	Input current A	Output current A	Adapt motor KW
Single phase power supply : 220V, 50/60HZ				
AV2000R4G1	1.1	5.0	3	0.4
AV2000R7G1	1.5	8.2	5	0.75
AV2001R5G1	3.0	14.0	7	1.5
AV2002R2G1	4.0	23.0	9.6	2.2
AV2004R0G1	6.3	26.5	16.5	4.0
AV2005R5G1	9.5	37.5	25	5.5
AV2007R5G1	12.6	50.0	33	7.5
Three phase power supply : 380V, 50/60HZ				
AV2000R7G3	1.5	3.4	2.1	0.75
AV2001R5G3	3.0	5.0	3.8	1.5
AV2002R2G3	4.0	5.8	5.1	2.2
AV2004R0G3	5.9	10.5	9.0	4.0
AV2005R5G3	8.9	14.6	13.0	5.5
AV2007R5G3	11.0	20.5	17.0	7.5
AV200011G3	17.0	35.0	25.0	11

Chapter 6 Wire distribute diagram



Category	Terminal symbol	Terminal name	Function instruction
Power supply	10V,GND	Outer connect 10V power supply	Outward provide +10V power supply, max output current 10mA, generally, it used as outer connect potential device power supply, potential device range value 1-5KΩ
	24V,COM	Outer connect 24V power supply	Outward provide +24V power supply, generally, it used as working power supply of digit input/ output terminals and working power supply of outer connected sensor;the max output current 200mA
Imitate input	AI1,GND	Imitate volume input terminal	Input range:DC 0V-10V /0mA-20mA, input electric resistance set by parameters: voltage input 22KΩ, current input pass through impedance 500Ω
Digit input	S1,COM	Digit input 1	Input impedance: 2.2KΩ Valid electric level input voltage range:9-30V
	S2,COM	Digit input 2	
	S3,COM	Digit input 3	
	S4,COM	Digit input 4	
	S5,COM	Digit input 5	
Imitate output	AOI,GND	Imitate output 1	Output voltage range: 0-10V
	AOV,GND	Imitate output 1	Output current range: 0mA~20mA
Digit output	DO1,GND	Digit output 1	Optocupler isolate, double polarity open collect circuit electrode output Output voltage range: 0-24V Output current range: 0mA~5mA
	DO2,GND	Digit output 2	
Electric relay output	TA,TC	Normally open terminal	Contact drive capacity : 250Vac/3A, cosø0.4 30Vdc/1A

Chapter 7 Function codes

Set AP-00 as non zero value, means that set parameters protection password, parameter menu only can enter into after correctly input password under function parameter mode and user modify parameter mode, need set AP-00 as 0 if need cancel password.

"√" : means the setting value of the parameter of frequency transform at power off and running status, all can be modified;

"×" : means the setting value of the parameter of frequency transform at power running status, can't be modified;

"○" : means this parameter is actually test and record value, can't be modified;

Basic function parameters simple table:

Function code	Name	Setting range	Leave factory value	Modify
Group A0 basic function group				
A0-00	G、P type setting	1: type G (constant torque load machine) 2: type P (fan, water pump type load machine)	1	×
A0-01	Motor control method	0: non speed sensor vector control (SVC) 2: V/F control	2	×
A0-02	Order source select	0: operating panel order passageway (LED extincted) 1: terminal order passageway (LED lighting) 2: series port communication passageway (LED flashing)	0	√
A0-03	Main frequency source A select	0: digit setting (UP/DOWN able to be modified) Not memory when power off, preset frequency A0-08) 1: digit setting (UP/DOWN able to be modified) Not memory when power off, preset frequency A0-08) 2: AI1 3: Electric potential device 6: multiply section orders 7: simple and easy PLC 8: PID 9: communication setting	3	×
A0-04	Assist frequency source B selection	Same to F0-03 (Main frequency source A select)	0	×
A0-05	Assist frequency source B range select when overlaying	0: relative to the max frequency 1: relative to frequency source A	0	√
A0-06	Assist frequency source B range when overlaying	0%～150%	100%	√
A0-07	Frequency source overlaying select	The unit: frequency source select 0: main 1: Main and assist calculate result (calculate relation confirmed by decade) 2: main <-->assist 3: main<-->main and assist calculate result 4: assist<-->main and assist calculate result Decade: frequency source main and assist calculate relationship 0: main+assist 1:main-assist 2: the max value from the both parameter 3: the min value from the both parameter	00	√
A0-08	Preset frequency	0.00Hz~the max frequency A0-10	50.00Hz	√
A0-09	Running direction	0: same direction 1: reverse direction	0	√

Function code	Name	Setting range	Leave factory value	Modify
A0-10	The max frequency	50.00Hz～320.00Hz	50.00Hz	×
A0-11	Up limit frequency source	0: A0-12 setting 1:AI1 2: electric potential device (this machine) 4: PULSE setting 5: communication setting	0	×
A0-12	Up limit frequency	Down limit frequency A0-14~the max frequency A0-10	50.00Hz	√
A0-13	Up limit frequency deviation	0.00Hz~the max frequency A0-10	0.00Hz	√
A0-14	Down limit frequency	0.00Hz~up limit frequency A0-12	0.00Hz	√
A0-15	Carriage wave frequency	0.5kHz～16.0kHz	Confirm model	√
A0-16	Carriage wave frequency adjusted along with temperature	0: No 1: Yes	1	√
A0-17	Accelerate time 1	0.00s～65000s	Confirm model	√
A0-18	Accelerate time 1	0.00s～65000s	Confirm model	√
A0-19	Accelerate and moderate time unit	0: 1s 1: 0.1s 2:0.01s	1	×
A0-21	Assist frequency source deviation digit setting	0.00Hz~the max frequency A0-10	0.00Hz	√
A0-22	Frequency order decimal point	1：0.1Hz 2：0.01Hz	2	×
A0-23	Digit setting frequency memory select	0: not memory 1: memory	1	√
A0-25	Accelerate and moderate time datum frequency	0: the max frequency (A0-10) 1: setting frequency 2:100Hz	0	×
A0-26	Frequency order UP/DOWN datum when running	0: running frequency 1: setting frequency	0	×
A0-27	Accelerate and moderate time datum frequency	The unit: operating panel order, tied frequency source select 0: no tied 1: digit setting frequency 2:AI1 3: electric potential device (this machine) 6: multiply section speed 7: simple and easy PLC 8: PID 9: communication setting Decade: terminal order, tied frequency source select Hundreds: series port communication order, tied frequency source selection Thousands: automatic running tied frequency selection	0000	√

Function code	Name	Setting range	Leave factory value	Modify
Group A1 basic motor parameters				
A1-00	Motor type select	0: common asynchronous motor 1: frequency transform asynchronous motor	0	×
A1-01	Motor rated power	0.1kW～1000.0kW	Confirm model	×
A1-02	Motor rated voltage	0V～2000V	Confirm model	×
A1-03	Motor rated power	0.01A～655.35A (frequency transformer power<=55kw) 0.1A～6553.5A (frequency transformer power>55kw)	Confirm model	×
A1-04	Motor rated frequency	0.00Hz～Maximum frequency	50.00Hz	×
A1-05	Motor rated speed	0rpm～65535rpm	1460rpm	×
A1-06	Asynchronous motor stator electric resistance	0.001Ω～65.535Ω(frequency transformer power<=55kw) 0.0001Ω～6.5535Ω(frequency transformer power>55kw)	Confirm model	×
A1-07	Asynchronous motor rotor electric resistance	0.001Ω～65.535Ω(frequency transformer power<=55kw) 0.0001Ω～6.5535Ω(frequency transformer power>55kw)	Confirm model	×
A1-08	Asynchronous motor leakage inductive reactance	0.001mH ～ 65.535mH (frequency transformer power<=55kw) 0.0001mH～6.5535mH (frequency transformer power>55kw)	Confirm model	×
A1-09	Asynchronous motor mutual inductive reactance	0.001mH ～ 65.535mH (frequency transformer power<=55kw) 0.0001mH～6.5535mH (frequency transformer power>55kw)	Confirm model	×
A1-10	Asynchronous motor unload current	0.01A ～ F1-03 (frequency transformer power<=55kw) 0.1A ～ F1-03 (frequency transformer power>55kw)	Confirm model	×
A1-32	A input select	0: voltage 0-10V 1: current 0-20mA	0	×
A1-37	Harmonious select	0: no operation 1: asynchronous motor static harmonious 2: asynchronous motor complete harmonious	0	×
Group A2 vector control parameters				
A2-00	Speed relative ratio gain 1	1～100	30	√
A2-01	Speed relative integral time 1	0.01s～10.00s	0.50s	√
A2-02	Shift frequency 1	0.00～F2-05	5.00Hz	√
A2-03	Speed relative ratio gain 2	1～100	20	√
A2-04	Speed relative integral time 2	0.01s～10.00s	1.00s	√
A2-05	Shift frequency 2	F2-02～Maximum frequency	10.00Hz	√
A2-06	Speed difference compensate coefficient	50%～200%	100%	√
A2-07	Speed ring filter wave time constant	0.000s～0.100s	0.000s	√
A2-08	Vector control over exciting gain	0～200	64	√
A2-09	Torque up limit number source of speed control (drive)	0: function code A2-10 setting 1: AI1 2: electric potential device (this machine) 5: communication setting	0	√
A2-10	Torque up limit number setting of speed control (drive)	0.0%～200.0%	150.0%	√
A2-13	Shaft M current relative ratio gain	0～20000	2000	√
A2-14	Shaft M current relative integral gain	0～20000	1300	√
A2-15	Shaft T current relative ratio gain	0～20000	1200	√
A2-16	Shaft T current relative integral gain	0～20000	1300	√
A2-17	Speed relative differential time	0～65535	0	√

Function code	Name	Setting range	Leave factory value	Modify
Group A3 V/F control parameters				
A3-00	V-f curve setting	0: straight line V/F curve 1: multiply points V/F curve 2: square V/F curve 3: 1.2 times V/F curve 4: 1.4 times V/F curve 6: 1.6 times V/F curve 8: 1.8 times V/F curve 9: remain 10: VF completely separate mode 11: VF semi separate mode	0	×
A3-01	Torque rising	0.0% : (automatic torque rising) 0.1%～30.0%	Confirm mode	√
A3-02	Torque rising stop frequency	0.00Hz～the max frequency	50.00Hz	×
A3-03	Multiply points VF frequency point 1	0.00Hz～A3-05	0.00Hz	×
A3-04	Multiply points VF voltage point 1	0.0%～100.0%	0.0%	×
A3-05	Multiply points VF frequency point 2	A3-03～A3-07	0.00Hz	×
A3-06	Multiply points VF voltage point 2	0.0%～100.0%	0.0%	×
A3-07	Multiply points VF frequency point 3	A3-05～motor rated frequency(A1-04)	0.00Hz	×
A3-08	Multiply points VF voltage point 3	0.0%～100.0%	0.0%	×
A3-09	Running difference compensate coefficient	0.0%～200.0%	0.0%	√
A3-10	VF over exciting gain	0～200	64	√
A3-11	Oscillating restrain gain	0～100	Confirm mode	√
A3-13	VF separated voltage source	0: digit setting (A3-14) 1: AI1 2:electric potential device (this machine) 5:multiply section speed 6: simple and easy PLC 7: PID 8: communication setting 100.0% corresponding to motor rated voltage	0	√
A3-14	VF separated voltage source digit setting	0V～motor rated voltage	0	√
A3-15	AVR automatic stabilize voltage	0: invalid 1: whole process valid 2: only invalid in moderate	0	√

Function code	Name	Setting range	Leave factory value	Modify
Group A4 input terminals				
A4-00	S1 terminal function select	0: no function 1: forward running (FWD) 2: reverse running (REV) 3: three wires type running control 4: forward crawl (FJOG) 5: reverse crawl (RJOG) 6: terminal UP 7: terminal DOWN 8: freely stop 9: failure reset (RESET) 10: running pause 11: outer failure normally open input 12: multiply sections order terminal 1 13: multiply sections order terminal 2 14: multiply sections order terminal 3 15: multiply sections order terminal 4 16: accelerate/moderate select terminal 1 17: accelerate/moderate select terminal 2 18: frequency source shift 19: UP/DOWN setting reset (terminal, keyboard) 20: running order shift terminals 21: accelerate/moderate stop 22: PID pause 23: PLC status reset 24: swing frequency pause 25: counter input 26: counter rest 27: length counting input 28: length reset 29: torque control forbidden 32: DC brake order 33: outer failure normally close input 34: frequency modify enable 35: opposite PID act direction 36: outer stop terminal 1 37: control order shift terminal 2 38: PID integral pause terminal 39: frequency source A and preset frequency shift terminal 40: frequency source A and preset frequency shift terminal 41: remain 42: remain 43: PID parameters shift terminals 44: user defined failure 1 45: user defined failure 2 46: speed/torque shift 47: emergency brake 48: outer stop terminal 2 49: moderate DC brake 50: this time running time reset 51: loosen gate feedback 52: gate close feedback 53-59: remain	1	×
A4-01	S2 terminal function select		2	×
A4-02	S3 terminal function select		9	×
A4-03	S4 terminal function select		12	×
A4-04	S5 terminal function select		13	×

Function code	Name	Setting range	Leave factory value	Modify
A4-10	S number input wave filter time	0.000s～1.000s	0.010s	√
A4-11	Terminal order method	0: two wires type 1 1: two wires type 2 3: three wires type 1 4: three wires type 2	0	×
A4-12	Terminal UP/DOWN variable ratio	0.001Hz～65.535Hz/s	1.00Hz	√
A4-13	The min input of curve 1	0.00V～A4-15	0.00V	√
A4-14	The min input corresponding setting of curve 1	-100.0%～+100.0%	0.0%	√
A4-15	The max input of curve 1	A4-13～+10.00V	10.00V	√
A4-16	The max input corresponding setting of curve 1	-100.0%～+100.0%	100.0%	√
A4-17	AI1 wave filter time	0.00s～10.00s	0.10s	√
A4-18	The min input of curve 2	0.00V～A4-20	0.00V	√
A4-19	The min input corresponding setting of curve 2	-100.0%～+100.0%	0.0%	√
A4-20	The max input of curve 2	A4-18～+10.00V	10.00V	√
A4-21	The max input corresponding setting of curve 2	-100.0%～+100.0%	100.0%	√
A4-22	Ai2 wave filter time	0.00s～10.00s	0.10s	√
A4-34	Ai lower than the min input setting select	The unit: AI1 lower than the min input setting select 0: the min input corresponding setting 1: 0.0% Decade: AI2 lower than the min input setting select, same to above Hundreds: AI3 lower than the min input setting select, same to above	000	√
A4-35	S1 delay time	0.0s～3600.0s	0.0s	×
A4-36	S2 delay time			
A4-37	S3 delay time			
A4-38	S input terminal valid status setting 1	0: high electric level 1: low electric level The unit: S1 Decade: S2 Hundreds: S3 Kilobit: S4 Myriabit: S5	00000	×

Function code	Name	Setting range	Leave factory value	Modify
Group A5 output terminals				
A5-00	Do2 multiply function terminal output select	0: pulse output (FMP) 1: open circuit collect electrode switch volume output (FMR)	0	√
A5-01	Do2 output select	0: no output 1: frequency transformer running 2: failure output (failure stop machine 1) 3: frequency level test FDT 1 output 4: frequency arrived 5: zero speed running (not output wen stop machine) 6: motor overload pre-alarm 7: frequency transformer overload pre-alarm 8: set counting value arrived 9: appointed counting value arrived 10.Length arrived 11.PLC circling finished 12.Running time arrived 13.Frequency limiting 14.Torque limiting 15.Running preparation ready 16.AI1>AI2 17.Up limit frequency arrived 18.Down limit frequency arrived (relate to running) 19.Lack voltage status output 20.Communication setting 21.Fix position finished 22.Fix position closed 23.Zero speed running 2 (also output when stop machine) 24.Power on time arrived 25.Frequency level test FDT2 output 26.Frequency arrive 1 output 27.Frequency arrive 2 output 28.current arrive 1 output 29.current arrive 2 output 30.Timing arrived output 31.AI1 input exceed up and down limit 32.Load loss 33.Running direction 34.Zero current test 35.Module temperature arrived 36.Software over current output 37.Down limit frequency arrived (not relate to running) 38.Failure output (continue running) 39.Motor over temperature pre-alarm 40.This time running time arrived 41.Failure output (failure of free power off and lack voltage not output)	0	√
A5-02	Control board electric relay output select		2	√
A5-04	Do1 output select		1	√
A5-07	Ao1 output select	0: running frequency 1: setting frequency 2: output current 3: output torque 4: output power 5: output voltage 7: AI1 8: electric potential device (this machine) 10: length 11: counting value 12: communication setting 13: motor speed	0	√

Function code	Name	Setting range	Leave factory value	Modify
A5-10	Ao1 zero deviation coefficient	-100.0%～100.0%	0.0%	√
A5-11	Ao1 gain	-10.00～10.00	1.00	√
A5-18	Control board electric relay 1 output delay time	0.0s～3600.0s	0.0s	√
A5-20	Do1 output delay time	0.0s～3600.0s	0.0s	√
A5-21	Do2 output delay time	0.0s～3600.0s	0.0s	√
A5-22	Do output terminal valid status select	0: positive logic 1: reverse logic The unit: FM Decade: control board electric relay 1 Hundreds: expand card electric relay 2 Kilobit: DO1 Myriabit: DO2	00000	√
Group A6 Start/stop control				
A6-00	Start method	0: directly start 1: speed tracing and restart 2: asynchronous motor pre-exciting start	0	√
A6-01	Speed tracing method	0: start from stop machine frequency 1: start from zero speed 2: start from max frequency	0	×
A6-02	Speed tracing quick and slow	1～100	20	√
A6-03	Start frequency	0.00Hz～10.00Hz	0.00Hz	√
A6-04	Start frequency maintain time	0.0s～100.0s	0.0s	×
A6-05	Start DC brake current	0%～100%	0%	×
A6-06	Start DC brake time	0.0s～100.0s	0.0s	×
A6-07	Accelerate/moderate method	0: linear accelerate/moderate 1: S curve accelerate/moderate A 2: S curve accelerate/moderate B	0	×
A6-08	S curve start stage time ratio	0.0%～(100.0%-A6-09)	30.0%	×
A6-09	S curve stop stage time ratio	0.0%～(100.0%-A6-08)	30.0%	×
A6-10	Stop machine method	0: moderate to stop machine 1: freely stop machine	0	√
A6-11	Stop machine DC brake start frequency	0.00Hz～the max frequency	0.00Hz	√
A6-12	Stop machine DC brake waiting time	0.0s～100.0s	0.0s	√
A6-13	A6-13Stop machine DC brake current	0%～100%	0%	√
A6-14	Stop machine DC brake time	0.0s～100.0s	0.0s	√
A6-15	Brake operating ratio	0%～100%	100%	√
Group A7 keyboard and indicate				
A7-00	LED second row common display select (only valid to double display keyboard)	Same to A7-03 A7-04 parameter definition	4	√
A7-01	M.F.K keys function select	0: MF invalid 1: operating panel order passageway and remote order passageway (terminal order passageway or series joggle communication passageway) shift 2: forward/reverse shift 3: forward crawl 4: reverse crawl	0	×
A7-02	STOP/RES key functions	0: STOP/RES key stop machine function valid only under keyboard control method 1: STOP/RES key stop machine function valid no matter under which control method	0	√

Function code	Name	Setting range	Leave factory value	Modify
A7-03	LED running display parameter 1	00: running frequency 01: setting frequency 02: bus line voltage 03: output voltage 04: output current 05: output power 06: output torque 07: S input status 08: DO output status 09: AI1 voltage 10: AI2 voltage 11: AI3voltage 12: counting value 13: length value 14: load speed display 15: PID setting 16: PID feedback 17: PLC stage 18: PULSE input pulse frequency 19: running frequency 2 20: rest running time 21: AI1 voltage before calibrating 22: AI2 voltage before calibrating 23: AI3 voltage before calibrating 24: linear speed 25: current power one time 26: current running time 27: PULSE input pulse frequency 28: communication setting value 29: coder feedback speed 30: Main frequency X display 31: assist frequency Y display	0	√
A7-04	LED stop machine display parameter		0	√
A7-06	Load speed display coefficient	0.01～100.00	1.00	√
A7-07	Converter module heat radiator temperature	0.0℃～100℃	-	○
A7-09	Accumulated running time	0h～65535h	-	○
A7-10	Brake voltage action point	100% ～ 160%	120%	√
A7-11	Software version number		-	○
A7-12	Load speed display decimal position	0: zero byte decimal 1: 1byte decimal 2: 2 bytes decimal 3: 3 bytes decimal	1	√
A7-13	Accumulate power time	0h～65535h	-	○
A7-14	Accumulate power consumption volume	0KW～65535KW/h	-	○
		Group A8 Assist functions		
A8-00	Crawl running frequency	0.00Hz～the max frequency	2.00Hz	√
A8-01	Crawl accelerate time	0.00s～65000s	20.0s	√
A8-02	Crawl moderate time	0.00s～65000s	20.0s	√
A8-03	Accelerate time 2	0.00s～65000s	20.0s	√
A8-04	Moderate time 2	0.00s～65000s	20.0s	√
A8-05	Accelerate time 3	0.00s～65000s	20.0s	√
A8-06	Moderate time 3	0.00s～65000s	20.0s	√

Function code	Name	Setting range	Leave factory value	Modify
A8-07	Accelerate time 4	0.00s～65000s	20.0s	√
A8-08	Accelerate time 4	0.00s～65000s	20.0s	√
A8-09	Jump frequency 1	0.00Hz～the max frequency	0.00Hz	√
A8-10	Jump frequency 2	0.00Hz～the max frequency	0.00Hz	√
A8-11	Jump frequency range	0.00Hz～the max frequency	0.01Hz	√
A8-12	Forward and reverse dead zone time	0.0s～3000.0s	0.0s	√
A8-13	Reverse control	0: allow reverse 1: forbid reverse	0	√
A8-14	Running action when frequency lower than down limit frequency	0: running at low limit frequency 1: stop machine 2: zero speed running	0	√
A8-15	Droop control	0.00Hz～10.00Hz	0.00Hz	√
A8-16	Set power on arrive time	0h～65535h	0H	√
A8-17	Set running arrive time	0h～65535h	0H	√
A8-18	Start protection select	0: not protect 1: protect	1	√
A8-19	Frequency test value (FDT1)	0.00Hz～the max frequency	50.00Hz	√
A8-20	Frequency test delay value (FDT1)	0.0%～100.0% (FDT electric level)	5.0%	√
A8-21	Frequency arrived test range	0.0%～100.0% (the max frequency)	0.0%	√
A8-22	Whether jump frequency valid during accelerate/moderate process	0: invalid 1: valid	0	√
A8-25	Accelerate/moderate time 1/2 shift frequency point	0.00Hz～the max frequency	0.00Hz	√
A8-26	Accelerate/moderate time 1/2 shift delay ring frequency	0.00Hz～the max frequency	0.00Hz	√
A8-27	Terminal crawl prior	0: invalid 1: valid	0	√
A8-28	Frequency test value (FDT2)	0.00Hz～the max frequency	50.00Hz	√
A8-29	Frequency test delay value (FDT2)	0.0%～100.0% (FDT electric level)	5.0%	√
A8-30	Any arrived frequency test value 1	0.00Hz～the max frequency	50.00Hz	√
A8-31	Any arrived frequency test range 1	0.0%～100.0% (the max frequency)	0.0%	√
A8-32	Any arrived frequency test value 2	0.00Hz～the max frequency	50.00Hz	√
A8-33	Any arrived frequency test range 2	0.0%～100.0% (the max frequency)	0.0%	√
A8-34	Zero current test level	0.0%～300.0% 100.0% corresponding motor rated current Not output when stop machine	5.0%	√
A8-35	Zero current test delay time	0.01s～600.00s	0.10s	√
A8-36	Software over current point	0.0%～300.0% (motor rated current)	200.0%	√
A8-37	Software over current test delay time	0.00s (not test) 0.01s～600.00s	0.00s	√
A8-38	Any arrived current 1	0.00%～300.0%	100.0%	√
A8-39	Any arrived current 1 width	0.00%～300.0%	0.0%	√
A8-40	Any arrived current 2	0.00%～300.0%	100.0%	√
A8-41	Any arrived current 2 width	0.00%～300.0%	0.0%	√
A8-42	Timing function select	0: invalid 1: valid	0	√

Function code	Name	Setting range	Leave factory value	Modify
A8-43	Set running time select	0: A8-44 setting 1: AI1 2: Electric potential device (this machine)	0	√
A8-44	Set running time	0.00 ~ 655.35Min	0.00	√
A8-45	AI1 input voltage protection value down limit	0.00V~F8-46	3.10V	√
A8-46	AI1 input voltage protection value up limit	F8-45~10.00V	6.80V	√
A8-47	Module temperature arrived	0.0~100℃	75℃	√
A8-48	Wake up pressure deviation value	0.0%~100%	50%	√
A8-50	Wake up delay time	0.0s~6500.0s	30.0s	√
A8-51	Dormant frequency	0.00Hz~the max frequency (A0-10)	0.00Hz	√
A8-52	Dormant delay time	0.0s~6500.0s	120.0s	√
A8-53	This time running arrived time setting	0.0Min ~ 6500.0Min	0.0Min	√
		Group A9 Failure and protection		
A9-00	Motor overload protection select	0: forbid 1: allow	1	√
A9-01	Motor overload protection coefficient	20%~120%	100%	√
A9-02	Motor overload pre-alarm coefficient	50%~100%	80%	√
A9-03	Over voltage loss speed gain	0~100	5	√
A9-04	Over voltage loss speed protection voltage	120%~150%	135%	√
A9-05	Over current loss speed gain	0~100	30	√
A9-06	Over current loss speed protection current	100%~210%	200%	√
A9-07	Power on grounding short circuit protection select	0: invalid 1: valid	0	√
A9-09	Failure automatic reset times	0~20	0	√
A9-10	Failure DO action select during failure automatic reset	0: action 1: no action	0	√
A9-11	Failure automatic reset interval time	0.1s~100.0s	1.0s	√
A9-12	Input lack phase protection select	0: forbid 1: allow	1	√
A9-13	Input lack phase protection select	0: forbid 1: allow	1	√
A9-14	First time failure type	0: no failure 1: inverter unit protection 2: accelerate over current 3: moderate over current 4: constant speed over current 5: accelerate over voltage 6: moderate over voltage 7: constant speed over voltage 8: buffer electric resistance overload failure 9: lack voltage failure 10: frequency transformer overload 11: motor overload 12: input lack phase 13: output lack phase 14: module too hot 15: outer failure	-	○

Function code	Name	Setting range	Leave factory value	Modify
A9-15	Second failure types	16: communication abnormal 17: contactor abnormal 18: current test failure 19: motor harmonious failure 20: coder/PG card failure 21: parameter read and write abnormal 22: frequency transformer hardware failure 23: motor grounding short circuit failure 24: remain	-	○
A9-16	Third failure (the latest one) types	25: remain 26: running time arrived 27: user self define failure 1 28: user self define failure 2 29: power on time arrived 30: load loss 31: running PID feedback loss 40: quickly limit current exceed time 41: shift motor failure during running 42: too big speed deviation 43: motor exceed speed 44: motor over temperature	-	○
A9-17	Frequency at third failure (the latest one)	-	-	○
A9-18	Current at third failure (the latest one)	-	-	○
A9-19	Bus line voltage at third failure (the latest one)	-	-	○
A9-20	Input terminal status at third failure (the latest one)	-	-	○
A9-21	Output terminal status at third failure (the latest one)	-	-	○
A9-22	Frequency transformer at third failure (the latest one)	-	-	○
A9-23	Time at third failure (the latest one) (start counting from this time power on)	-	-	○
A9-24	Time at third failure (the latest one) (start counting from running time)	-	-	○
A9-25	PID special mode and special machine select	0: invalid 1: PID mode 1 2: PID mode 2 3: constantly supply water special machine		
A9-27	Frequency at second failure	-	-	○
A9-28	Current at second failure	-	-	○
A9-29	Bus line voltage at second failure	-	-	○
A9-30	Input terminal status at second failure	-	-	○
A9-31	Output terminal status at second failure	-	-	○
A9-32	Frequency status at second failure	-	-	○
A9-33	Time at second failure (start counting from this time power on)	-	-	○
A9-34	Time at second failure (start counting from running time)	-	-	○
A9-37	Frequency at second failure	-	-	○
A9-38	Current at second failure	-	-	○

Function code	Name	Setting range	Leave factory value	Modify
A9-39	Bus line voltage at first failure	-	-	○
A9-40	Input terminal status at first failure	-	-	○
A9-41	Output terminal status at first failure	-	-	○
A9-42	Frequency transformer status at first failure	-	-	○
A9-43	Time at first failure (start counting from this time power on)	-	-	○
A9-44	Time at first failure (start counting from running time)	-	-	○
A9-47	Failure protect action select 1	0: freely stop machine 1: stop machine through press stop machine 2: continue running The unit: motor overload 11 Decade: input lack phase 12 Hundreds: output lack phase 13 Kilobit: outer failure 15 Myriabit: communication failure 16	00000	√
A9-49	Failure protect action select 3	The unit: user self define failure 127 0: freely stop machine 1: stop machine through press stop machine 2: continue running Decade: user self define failure 228 0: freely stop machine 1: stop machine through press stop machine 2: continue running Kilobit: load loss 30 0: freely stop machine 1: moderate to stop machine 2: reduce to 7% rated frequency of motor and continue running, automatically recover to set frequency and running when no load loss Myriabit: running PID feedback loss 31 0: freely stop machine 1: stop machine through press stop machine 2: continue running	00000	√
A9-50	Failure protect action select 4	The unit: too big speed deviation 42 0: freely stop machine 1: stop machine through press stop machine 2: continue running Decade: motor exceed speed 43 Hundreds: initial position error 51	00000	√
A9-54	Continue running frequency select when failure	0: running at the current running frequency 1: Running at the set frequency 2: Running at the up limit frequency 3: Running at the down limit frequency 4: Running at the reserve frequency when abnormal	0	√
A9-55	Abnormal reserve frequency setting	60.0%～100.0%	100.0%	√
A9-56	Motor temperature sensor type	0 : no temperature sensor 1 : PT100	0	√
A9-57	Motor over heat protection threshold	0℃～200℃	110℃	√
A9-58	Motor over heat pre-alarm threshold	0℃～200℃	90℃	√

Function code	Name	Setting range	Leave factory value	Modify
A9-59	Suddenly stop/not stop function select	0: invalid 1: moderate 2: moderate and stop machine	0	√
A9-60	Suddenly stop/not stop/pause judgement voltage	80.0%～100.0%	90.0%	√
A9-61	Suddenly stop/not stop/voltage return rising judge time	0.00s～100.00s	0.50s	√
A9-62	Suddenly stop/not stop action judgement voltage	60.0%～100.0%	80.0%	√
A9-63	Load loss protection select	0: invalid 1: valid	0	√
A9-64	Load loss test level	0.0～100.0%	10.0%	√
A9-65	Load loss test time	0.0～60.0s	1.0s	√
A9-67	Over speed test value	0.0～50.0%	20.0%	√
A9-68	Over speed test time	0.0～60.0s	1.0s	√
A9-69	Test value of too big speed deviation	0.0～50.0%	20.0%	√
A9-70	Test time of too big speed deviation	0.0～60.0s	5.0s	√
		Group Aa PID function		
AA-00	PID set source	0: AA-01 setting 1: AI1 2: electric potential device (this machine) 5: communication setting 6: multiply section order setting	0	√
AA-01	PID value setting	0.0%～100.0%	50.0%	√
AA-02	PID feedback source	0: AI1 1:electric potential device (this machine) 3: AI1-AI2 5: communication setting 6: multiply section order setting	0	√
AA-03	PID act direction	0: positive 1: reverse	0	√
AA-04	PID setting feedback measure range	0～65535	1000	√
AA-05	Ratio gain P1	0.0～100.0	20.0	√
AA-06	Integral time 1	0.01s～10.00s	2.00s	√
AA-07	Differential time D1	0.000s～10.000s	0.00s	√
AA-08	PID reverse stop frequency	0.00～the max frequency	2.00Hz	√
AA-09	PID deviation limit	0.0%～100.0%	0.0%	√
AA-21	Feedback signal protect function select	The unit: feedback broken wire test select 0: invalid 1:alarm and running at fix frequency (TU/TC) flashing, fix running frequency set by AA-22 2: Failure stop machine, failure 31 feedback wire broken failure Decade: feedback over voltage protection select 0: invalid 1: alarm and running at fix frequency (TU/TC) flashing, fix running frequency set by AA-25 2: failure stop machine, failure 24 PID feedback too big failure	0	√
AA-22	Feedback broken wire alarm fix running frequency setting	0.00 ～ the max frequencyA0-10	25.00hz	√
AA-23	Too big PID feedback test value	20.0% ～ 100.0%	100%	√

Function code	Name	Setting range	Leave factory value	Modify
AA-24	PID feedback too big test time	0.0s ～ 3600.0s	3.0s	○
AA-25	PID feedback too big alarm running fix frequency setting	0.00 ～ the max frequencyA0-10	0.00hz	○
AA-26	PID feedback loss test value	0.0 : not judge the feedback loss 0.1～100.0%	0.0%	√
AA-27	PID feedback loss test time	0.0s～20.0s	0.0s	√
Group Ab swing frequency, fix length and counting				
Ab-00	Swing frequency setting method	0: relate to center frequency 1: relate to the max frequency	0. 00	√
Ab-01	Swing frequency range	0.0%～100.0%	0.0%	√
Ab-02	Suddenly jump frequency range	0.0%～50.0%	0.0%	√
Ab-03	Swing frequency period	0.1s～3000.0s	10.0s	√
Ab-04	Delta wave rise time of swing frequency	0.1%～100.0%	50.0%	√
Ab-05	Set length	0m～65535m	1000m	√
Ab-06	Actual length	0m～65535m	0m	√
Ab-07	Pulse number per meter	0.1～6553.5	100.0	√
Ab-08	Set counting value	1～65535	1000	√
Ab-09	Appoint counting value	1～65535	1000	√
Group Ac multiply section order, simple and easy PLC				
AC-00	Multiply section order 0	-100.0%～100.0% (100.0%corresponding the max frequencyA0-10)	0.0%	√
AC-01	Multiply section order 1	-100.0%～100.0%	0.0%	√
AC-02	Multiply section order 2	-100.0%～100.0%	0.0%	√
AC-03	Multiply section order 3	-100.0%～100.0%	0.0%	√
AC-04	Multiply section order 4	-100.0%～100.0%	0.0%	√
AC-05	Multiply section order 5	-100.0%～100.0%	0.0%	√
AC-06	Multiply section order 6	-100.0%～100.0%	0.0%	√
AC-07	Multiply section order 7	-100.0%～100.0%	0.0%	√
AC-08	Multiply section order 8	-100.0%～100.0%	0.0%	√
AC-09	Multiply section order 9	-100.0%～100.0%	0.0%	√
AC-10	Multiply section order 10	-100.0%～100.0%	0.0%	√
AC-11	Multiply section order 11	-100.0%～100.0%	0.0%	√
AC-12	Multiply section order 12	-100.0%～100.0%	0.0%	√
AC-13	Multiply section order 13	-100.0%～100.0%	0.0%	√
AC-14	Multiply section order 14	-100.0%～100.0%	0.0%	√
AC-15	Multiply section order 15	-100.0%～100.0%	0.0%	√
AC-16	Simple and easy PLC running method	0: single time running finished and power off 1: single time running finished and maintain final value' 2: always circling	0	√
AC-17	Simple and easy PLC loss power memory select	The unit: power loss memory select 0: power loss and not memory 1: power loss and memory Decade: power loss and memory select 0: power loss and not memory 1: power loss and memory	00	√

Function code	Name	Setting range	Leave factory value	Modify
AC-18	PLC 0 stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-19	PLC 0 stage accelerate/moderate time select	0～3	0	√
AC-20	PLC 1st stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-21	PLC 1st stage accelerate/moderate time select	0～3	0	√
AC-22	PLC 2ndstage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-23	PLC 2nd stage accelerate/moderate time select	0～3	0	√
AC-24	PLC 3rd stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-25	PLC 3rd stage accelerate/moderate time select	0～3	0	√
AC-26	PLC 4th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-27	PLC 4th stage accelerate/moderate time select	0～3	0	√
AC-28	PLC 5th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-29	PLC 5th stage accelerate/moderate time select	0～3	0	√
AC-30	PLC 6th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-31	PLC 6th stage accelerate/moderate time select	0～3	0	√
AC-32	PLC 7th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-33	PLC 7th stage accelerate/moderate time select	0～3	0	√
AC-34	PLC 8th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-35	PLC 8th stage accelerate/moderate time select	0～3	0	√
AC-36	PLC 9th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-37	PLC 9th stage accelerate/moderate time select	0～3	0	√
AC-38	PLC 10th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-39	PLC 10th stage accelerate/ moderate time select	0～3	0	√
AC-40	PLC 11th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-41	PLC 11th stage accelerate/ moderate time select	0～3	0	√
AC-42	PLC 12th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-43	PLC 12th stage accelerate/ moderate time select	0～3	0	√
AC-44	PLC 13th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-45	PLC 13th stage accelerate/ moderate time select	0～3	0	√
AC-46	PLC 14th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-47	PLC 14th stage accelerate/ moderate time select	0～3	0	√
AC-48	PLC 15th stage running time	0.0s(h)～6553.5s(h)	0.0s(h)	√
AC-49	PLC 15th stage accelerate/ moderate time select	0～3	0	√
AC-50	PLC running time unit	0: s (second) 1: h (hour)	0	√
AC-51	Multiply section order 0 set method	0: function code AC-00 setting 1: AI1 2: electric potential device (this machine) 5: PID 6: preset frequency (A0-08) setting, UP/DOWN able to be modified	0	√

Function code	Name	Setting range	Leave factory value	Modify
Group Ad communication parameters				
Ad-00	Baud rate	The unit: Modbus 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Decade: remain Hundreds: remain Kilobit: Canllink baud rate 0: 20 1: 50 2: 100 3: 125 4: 250 5: 500 6: 1M	6005	√
Ad-01	Data format	0: no check (8-n-2) 1: even check (8-E-1) 2: odd check (8-O-1) 3: invalid check 8-N-1	0	√
Ad-02	This machine address	1～247, 0is broadcast address	1	√
Ad-03	Apply delay	0ms～20ms	2	√
Ad-04	Communication overtime time	0.0 (invalid), 0.1s～60.0s	0.0	√
Ad-06	Communication read current resolution	0 : 0.01A 1 : 0.1A	0	√
Group Ap User password				
AP-00	User password	0～65535	0	√
AP-01	Parameter initialize	0: no operation 01: recover leave factory parameters, not include motor parameters 02: clear recorded information 04: backup user's current parameters 05: recover user's reserve parameters	0	×
AP-04	Function code property modify	0: function code able to be modified 1: function code can't be modified	0	√
Group B0 Torque control and limit parameters				
B0-00	Torque control method	0: speed control 1: torque control	0	×
B0-01	Drive torque up limit source	0: digit set 1 (B0-03) 1: AI 1 2: AI2 4: PULSE setting 5: communication setting 6: MIN (AI1, AI2) Corresponding B0-03 digit setting	0	×

Function code	Name	Setting range	Leave factory value	Modify
B0-03	Torque control method torque digit setting	-200.0%～200.0%	150.0%	√
B0-05	Torque control forward max frequency	0.01Hz～the max frequency	50.00Hz	√
B0-06		0.01Hz～the max frequency	50.00Hz	√
B0-07	Torque accelerate time	0.00s～650.00s	0.00s	√
B0-08	Torque moderate time	0.00s～650.00s	0.00s	√
Group B1 invented DI, invented DO				
B1-00	Invented VS1 terminal function select	0～59	0	×
B1-01	Invented VS2 terminal function select	0～59	0	×
B1-02	Invented VS3 terminal function select	0～59	0	×
B1-03	Invented VS4 terminal function select	0～59	0	×
B1-04	Invented VS5 terminal function select	0～59	0	×
B1-06	Invented VS terminal function setting valid status Torque control reverse max frequency	0: invalid 1: valid The unit: invented VS1 Decade: invented VS2 Hundreds: invented VS3 Kilobit: invented VS 4 Myriabit: invented VS 5	00000	×
B1-07	Ai1 terminal function select (as S terminal)	0～59	0	×
B1-08	Ai2 terminal function select (as S terminal)	0～59	0	×
B1-09	Ai3 terminal function select (as S terminal)	0～59	0	×
B1-10	Valid mode select when AI terminal as S terminal	0: low electric level 1: high electric level The unit: AI1 Decade: AI2	000	×
B1-11	Invented VD O1 output select	0: short connect with internal physical Sx 1~44: details check group A5 physical DO output select	0	√
B1-12	Invented VD O2 output select	0: short connect with internal physical Sx 1~44: details check group A5 physical DO output select	0	√
B1-13	Invented VD O3 output select	0: short connect with internal physical Sx 1~44: details check group A5 physical DO output select	0	√
B1-14	Invented VD O4 output select	0: short connect with internal physical Sx 1~44: details check group A5 physical DO output select	0	√
B1-15	Invented VD O5 output select	0: short connect with internal physical Sx 1~44: details check group A5 physical DO output select	0	√
B1-16	VD O1 output delay time	0.0s～3600.0s	0.0s	√
B1-17	VD O2 output delay time	0.0s～3600.0s	0.0s	√
B1-18	VD O3 output delay time	0.0s～3600.0s	0.0s	√
B1-19	VD O4 output delay time	0.0s～3600.0s	0.0s	√
B1-20	VD O5 output delay time	0.0s～3600.0s	0.0s	√
B1-21	VDO output terminal valid status select	0: positive logic 1: reverse logic The unit:VDO1 Decade: VDO2 Hundreds: VDO3 Kilobit: VDO 4 Myriabit: VDO 5	00000	√

Function code	Name	Setting range	Leave factory value	Modify
Group B5 control optimize parameters				
B5-00	PWM shift up limit frequency	0.00 ~ 15.00Hz	12.00Hz	√
B5-01	PWM modulate method	0: asynchronous modulate 1: synchronous modulate	0	√
B5-02	Dead zone compensate mode select	0: not compensate 1: compensate mode 1 2: compensate mode 2	1	√
B5-03	Random PWM depth	0: random PWM invalid 1~10: PWM carriage frequency random depth	0	√
B5-04	Quickly limit current enable	0: non enable 1: enable	1	√
B5-05	Current test compensate	0~100	5	√
B5-06	Lack voltage point setting	60.0%~14.0% Three phase: 100.0% corresponding bus line voltage 350.0V Two phase: 100.0% corresponding bus line voltage 200.0V	100.0%	√
B5-08	Dead zone time adjustment	100%~200%	150%	√
B5-09	Over voltage setting	200.0V~2500.0V	select confirmed	√
U0 monitor parameter group				
U0-00	Running frequency (Hz)		0.01Hz	7000H
U0-01	Setting frequency (Hz)		0.01Hz	7001H
U0-02	Bus line voltage (V)		0.1V	7002H
U0-03	Output voltage (V)		1V	7003H
U0-04	Output current		0.01A	7004H
U0-05	Output power (KW)		0.1KW	7005H
U0-06	Output torque (%)		0.1%	7006H
U0-07	S terminal input status		1	7007H
U0-08	DO terminal output status		1	7008H
U0-09	Ai1 voltage (V)		0.01V	7009H
U0-10	Ai2 voltage (V)		0.01V	700AH
U0-11	Voltage before calibrate this machine electric potential device		0.01V	700BH
U0-12	Counting value		1	700CH
U0-13	Length value		1	700DH
U0-14	Load speed display		1	700EH
U0-15	PID setting		1	700FH
U0-16	PID feedback		1	7010H
U0-17	PLC stage		1	7011H
U0-18	Input pulse frequency (Hz)		0.01KHz	7012H
U0-19	Load speed (Hz)		0.01Hz	7013H
U0-20	Rest running time		0.1min	7014H
U0-21	Voltage before AI1 calibration		0.001V	7015H
U0-22	Voltage before AI2 calibration		0.001V	7016H
U0-23	Voltage before AI3 calibration		0.001V	7017H
U0-24	Line speed		1m/min	7018H
U0-25	Current power on time		1min	7019H

Function code	Name	Setting range	Leave factory value	Modify
U0-26	Current running time		0.1min	701AH
U0-27	Input pulse frequency (Hz)		1Hz	701BH
U0-28	Communication setting value		0.01%	701CH
U0-29	Coder feedback speed		0.01Hz	701DH
U0-30	Main frequency A display		0.01Hz	701EH
U0-31	Assist frequency B display		0.01Hz	701FH
U0-32	Remain		-	
U0-33	Synchronous rotor position		0.1°	7021H
U0-34	Motor temperature value		1℃	7022H
U0-35	Target torque		0.1%	7023H
U0-36	Revolve variable position		1	7024H
U0-37	Power factor angle		0.1°	7025H
U0-38	ABZ position		1	7026H
U0-39	VF separate target voltage		1V	7027H
U0-40	VF separate output voltage		1V	7028H
U0-41	S terminal input visually display		1	7029H
U0-42	DO terminal output status visually display		1	702AH
U0-43	S terminal function status visually display 1		1	702BH
U0-44	S terminal function status visually display 2		1	702CH
U0-45	Multiply sections speed stage		1	702DH
U0-46	Display frequency transformer rated current		1A	
U0-58	Remain		-	703AH
U0-59	Setting frequency		0.01%	703BH
U0-60	Running frequency		0.01%	703CH
U0-61	Frequency transformer status		1	703DH
U0-62	Current failure code		1	703EH
U0-63	Remain		-	
U0-64	Remain		-	
U0-65	Torque up limit		0.01%	7041H

Chapter 8 Failure diagnose and troubleshooting

Failure alarm and policies

AV20 series frequency transformer total has 24 items warning information and protect functions, protect function act once happened failure, frequency transformer stop output, frequency transformer failure electric relay contact action, and display failure code on the display panel of frequency transformer. The user able to process self check according to reminding in this section before seeking for service, analyse the failure reason and find out the solve methods. Please seeking for service if belong to the described reason in dot line frame, contact your agent of frequency transformer or directly contact our company.

Failure name	Converter unit protection
Operating panel display	E-01
Failure reason one by one check	1.Short circuit at frequency transformer output circuit 2.Too long wiring at motor and frequency transformer 3.Too hot module 4.Internal wiring loosen in frequency transformer 5.Main control board abnormal 6.Drive board abnormal 7.Converter module abnormal
Failure solve methods	1.Solve the periphery failure 2.Additionally install electric reactor or output wave filter 3.Check whether air channel blocked, whether fan normally work and solve the existing problems 4.Insert all connect wires well 5.Seeking for technical support 6.Seeking for technical support 7.Seeking for technical support

Failure name	Accelerate over current
Operating panel display	E-02
Failure reason one by one check	1.Short circuit or grounding at frequency transformer output circuit 2.Control method is vector and not process parameter distinguish 3.Too short accelerate time 4.Unsuitable manual torque rise or V/F curve 5.Lower voltage 6.Start the revolving motor 7.Suddenly add load during accelerate process Smaller frequency transformer model
Failure solve methods	1.Solve the periphery failure 2.Process motor parameter distinguish 3.Add accelerate time 4.Adjust manual torque rise or V/F curve 5.Adjust the voltage to normal range 6.Select speed tracing start or restart after motor stopped 7.Cancel suddenly added load 8.Select more bigger power grade frequency transformer

Failure name	Moderate over current
Operating panel display	E-03
Failure reason one by one check	1.Short circuit or grounding at frequency transformer output circuit 2.Control method is vector and not process parameter distinguish 3.Too short accelerate time 4.Unsuitable manual torque rise or V/F curve 5.Lower voltage 6.Suddenly added load during accelerate process Not additionally added brake unit and brake electric resistance
Failure solve methods	1.Solve the periphery failure 2.Process motor parameter distinguish 3.Add moderate time 4.Adjust the voltage to normal range 5.Cancel suddenly added load Additionally added brake unit and electric resistance

Failure name	Constant speed over current
Operating panel display	E-04
Failure reason one by one check	1.Short circuit or grounding at frequency transformer output circuit 2.Control method is vector and not process parameter distinguish 3.Too low voltage 4.Whether has suddenly added load during running Smaller frequency transformer model
Failure solve methods	1.Solve the periphery failure 2.Process motor parameter distinguish 3.Adjust the voltage to normal range 4.Cancel suddenly added load 5.Select more bigger power grade frequency transformer

Failure name	Accelerate over voltage
Operating panel display	E-05
Failure reason one by one check	1.More higher input voltage 2.Existing outer force drive motor to run during accelerate process 3.Too short accelerate time Not additionally added brake unit and brake electric resistance
Failure solve methods	1.Adjust the voltage to normal range 2.Cancel this outer force or additionally added brake electric resistance 3.Add accelerate time Additionally added brake unit and electric resistance

Failure name	Accelerate over voltage
Operating panel display	E-06
Failure reason one by one check	1.More higher input voltage 2.Existing outer force drive motor to run during accelerate process 3.Too short accelerate time Not additionally added brake unit and brake electric resistance
Failure solve methods	1.Adjust the voltage to normal range 2.Cancel this outer force or additionally added brake electric resistance 3.Add moderate time Additionally added brake unit and electric resistance

Failure name	Constant speed over voltage
Operating panel display	E-07
Failure reason one by one check	1.More higher input voltage 2.Existing outer force drive motor to run during accelerate process
Failure solve methods	1.Adjust the voltage to normal range 2.Cancel this outer force or additionally added brake electric resistance

Failure name	Control power supply failure
Operating panel display	E-08
Failure reason one by one check	1、Input voltage not in the standard stipulated range
Failure solve methods	1、Adjust the voltage to standard stipulated normal range

Failure name	Lack voltage failure
Operating panel display	E-09
Failure reason one by one check	1.Suddenly power off 2.Input voltage at input terminal of frequency transformer not in the standard required range 3.Abnormal bus line voltage 4.Rectification bridge and buffer electric resistance abnormal 5.Drive board abnormal 6.Control board abnormal
Failure solve methods	1.Reset failure 2.Adjust the voltage to normal range 3.Seeking for technical support 4.Seeking for technical support 5.Seeking for technical support 6.Seeking for technical support

Failure name	Frequency transformer overload
Operating panel display	E-10
Failure reason one by one check	1.Whether too big load or happen motor blocked running 2.Smaller frequency transformer model
Failure solve methods	1.Reduce load and check the situation of motor and mechanism 2.Select more bigger power grade frequency transformer

Failure name	Motor overload
Operating panel display	E-11
Failure reason one by one check	1.Whether motor protection parameter A9-01 setting are suitable 2.Whether too big load or happen motor blocked running 1.Smaller frequency transformer model
Failure solve methods	1.Correctly set this parameter 2.Reduce load and check the situation of motor and mechanism 1.Select more bigger power grade frequency transformer

Failure name	Input lack phase
Operating panel display	E-12
Failure reason one by one check	1.Three phase input power supply abnormal 2.Drive board abnormal 3.Thunder protection board abnormal 4.Main control board abnormal
Failure solve methods	1.Check whether air channel blocked, whether fan normally work and solve the existing problems 2.Seeking for technical support 3.Seeking for technical support 4.Seeking for technical support

Failure name	Output lack phase
Operating panel display	E-13
Failure reason one by one check	1.Drawing wire from frequency transformer to motor abnormal 2.Three phase output of frequency transformer output unbalance when motor running 3.Drive board abnormal 4.Module abnormal
Failure solve methods	1.Solve the periphery failure 2.Check whether motor three phase winding are correct and solve the problems 3.Seeking for technical support 4.Seeking for technical support

Failure name	Module too hot
Operating panel display	E-14
Failure reason one by one check	1.Too high environment temperature 2.Air channel blocked 3.Module thermal sensitive electric resistance damages 4.Converter module damages
Failure solve methods	1.Reduce environment temperature 2.Clean air channel 3.Renewal fan 4.Renewal thermal sensitive electric resistance 5.Renewal converter module

Failure name	Periphery equipment failure
Operating panel display	E-15
Failure reason one by one check	1.Input outer failure signal through multiply functions terminal S 2.Input outer failure signal through invented IO function
Failure solve methods	1.Reset running 2.Reset running

Failure name	Communication failure
Operating panel display	E-16
Failure reason one by one check	1.Host computer working abnormal 2.Communication wire abnormal 3.Incorrect communication expanding card A0-28 setting 4.Incorrect communication parameter group Ad setting
Failure solve methods	1.Check host computer connection 2.Check communication connect wire 3.Correctly set communication expanding card type 4.Correctly set communication parameters

Failure name	Contactor failure
Operating panel display	E-17
Failure reason one by one check	1.Drive board and power supply abnormal 2.Contactor abnormal
Failure solve methods	1.Renewal drive board or power supply board 2.Renewal contactor

Failure name	Current test failure
Operating panel display	E-18
Failure reason one by one check	1.Check Hall apparatus abnormal 2.Drive board abnormal
Failure solve methods	1.Renewal Hall apparatus 2.Renewal drive board

Failure name	Motor harmonious failure
Operating panel display	E-19
Failure reason one by one check	1.Motor parameter not set according to data plate 2.Parameters distinguish process over time
Failure solve methods	1.Correctly set motor parameter according to data plate 2.Check the draw wire from frequency transformer to motor

Failure name	Code tray failure
Operating panel display	E-20
Failure reason one by one check	1.Coder model not matched 2.Coder wiring error 3.Coder damaged 4.PG card abnormal
Failure solve methods	1.Correctly set coder type according to actual situation 2.Solve circuit failure 3.Coder damaged 4.Renewal PG card

Failure name	EEPROM read and write failure
Operating panel display	E-21
Failure reason one by one check	1.EEPROM chip damages
Failure solve methods	1.Renewal main control board

Failure name	Frequency transformer failure
Operating panel display	E-22
Failure reason one by one check	1.Existing over voltage 2.Existing over current
Failure solve methods	1.Treatment according to over voltage failure 2.Treatment according to over current failure

Failure name	Grounding short circuit failure
Operating panel display	E-23
Failure reason one by one check	1.motor grounding short circuit
Failure solve methods	1.Renewal cable or motor

Failure name	Accumulate running time arrived failure
Operating panel display	E-26
Failure reason one by one check	1.Accumulated running time arrived setting value
Failure solve methods	1.Use parameter initialize function clear record information

Failure name	User self define failure 1
Operating panel display	E-27
Failure reason one by one check	1.Input signal of user self define failure 1 through multiply function terminal S 2.Input signal of user self define failure 1 through invented IO function
Failure solve methods	1.Reset running 2.Reset running

Failure name	User self define failure 2
Operating panel display	E-28
Failure reason one by one check	1.Input signal of user self define failure 1 through multiply function terminal S 2.Input signal of user self define failure 1 through invented IO function
Failure solve methods	1.Reset running 2.Reset running

Failure name	Accumulated power on time arrived failure
Operating panel display	E-29
Failure reason one by one check	1.Accumulated running time arrived setting value
Failure solve methods	1.Use parameter initialize function clear record information

Failure name	Load loss failure
Operating panel display	E-30
Failure reason one by one check	1.Running current of frequency transformer less than A9-64
Failure solve methods	1.Confirm whether load separated or whether A9-64 and A9-65 parameter setting accordance with actual running working status

Failure name	PID feedback loss failure when running
Operating panel display	E-31
Failure reason one by one check	1.PID feedback less than AA-26 setting value
Failure solve methods	1.Check whether PID feedback signal or set AA-26 as one suitable value

Failure name	Wave to wave and limit current failure
Operating panel display	E-40
Failure reason one by one check	1.Whether too big load or happen motor block running 2.Smaller frequency transformer model
Failure solve methods	1.Reduce load and check the situation of motor and mechanism 2.Select more bigger power grade frequency transformer

Failure name	Shift motor failure during running
Operating panel display	E-41
Failure reason one by one check	1.Modify current motor select through terminal during frequency transformer running
Failure solve methods	1.Process motor shift operation after frequency transformer stopped

Failure name	Too big speed deviation running
Operating panel display	E-42
Failure reason one by one check	1.Incorrect coder parameters setting 2.Not process parameters distinguish 3.Unreasonable too big speed deviation test parameters A9-69 and A9-60 setting
Failure solve methods	1.Correctly set coder parameters 2.Process parameters distinguish 3.Reasonably set test parameters according to actual situation

Failure name	Motor over speed failure
Operating panel display	E-43
Failure reason one by one check	1.Incorrect coder parameters setting 2.Not process parameters distinguish 3.Unreasonable too big speed deviation test parameters A9-69 and A9-60 setting
Failure solve methods	1.Correctly set coder parameters 2.Process parameters distinguish 3.Reasonably set test parameters according to actual situation

Failure name	Motor over temperature failure
Operating panel display	E-45
Failure reason one by one check	1.Temperature sensor wiring loosen 2.Too high motor temperature
Failure solve methods	1.Check wiring of temperature sensor and solve the problem 2.Reduce load frequency or adopt other heat radiation actions to process heat radiation treatment for motor

Failure name	Initial position error
Operating panel display	E-51
Failure reason one by one check	1.Too big deviation between motor parameter and actual deviation
Failure solve methods	1.Reconfirm whether motor parameter correct, important focus on whether smaller setting of rated current

Common failure and troubleshooting

The frequency transformer maybe meet the below failure situation during operating, please refer to the below methods and process simple failure analyse:

Table 8-1 Common failure and troubleshooting

S/N	Failure appearance	Possible reason	Solve method
1	Power on but no display	No power grid voltage or too low; Switch power supply on frequency transformer drive board failure; Rectification bridge damage; Frequency transformer buffer electric resistance damage; Control board and keyboard failure; Connect wires among control board, drive board and keyboard broken;	Check input power supply; Check bus line voltage Insert and plug out chip and chip wire again Seeking for manufacture service;
2	Display procedure version	Bad contact between control board and drive board; The relate apparatus on control board damage; Motor or motor wire has grounding short circuit; Hall failure; Too low power grid voltage;	Insert and plug out chip and chip wire again Seeking for manufacture service;
3	Power on display "E-23" alarm	Motor or output wire has grounding short circuit; Frequency transformer damage;	Use megger measure motor and output wire insulation Seeking for manufacture service;
4	Frequency transformer display normally after power on, display procedure version after running and stop machine immediately	Fan damage or block running; Periphery control terminal wiring has short circuit	Renewal fan; Solve outer short circuit failure
5	Frequently report E-14 (too hot module) failure	Too high setting load frequency; Fan damage or block running; Internal apparatus of frequency transformer damage (thermal coupler or others)	Reduce load carriage frequency (A0-15); Renewal fan and clean air channel; Seeking for manufacture service;
6	Motor not running after frequency transformer run	Motor and motor wire; Error frequency transformer setting (motor parameters) Bad contact between control board and drive board; Drive board failure;	Reconfirm the connect wire between frequency transformer and motor; Renewal motor or clear mechanism failure; Check and reset motor parameters;
7	Input terminal invalid	Error parameter setting; Error outer signal OP and 24V jump wire loosen; Control board failure;	Check and reset the relate parameters of group A4; Reconnect outer signal wire; Reconfirm jump line between OP and 24V; Seeking for manufacture service;
8	Motor speed unable to improve when close loop vector control	Coder error; Coder wrong wiring or bad contact; PG card failure; Drive board failure;	Renewal code tray and reconfirm wiring; Renewal PG card; Seeking for manufacture service;
9	Frequency transformer frequently report over current and over voltage failure	Incorrect motor parameters setting Unsuitable accelerate/moderate time Load wave;	Reset motor parameters or process motor harmonious Set suitable accelerate and moderate time; Seeking for manufacture service;
10	Power on (or running) eport E-17	Soft start contactor not absorbed;	Check whether cable of contactor loosen; Check whether contactor has failure; Check whether 24V supply power of contactor has failure; Seeking for manufacture service;
11	Power on display 	The relate apparatus on control board damages;	Renewal control board;

Chapter 9 Series communication

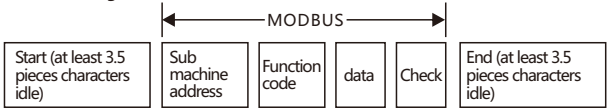
AV20 series frequency transformer support four types communication agreement such as Modbus-TRU,CANopen, Profibus-DP,
user programmable card and point to point communication belong to derive version of CANlink. Host computer able to realize that control frequency transformer, monitor and function parameter modify and check operation through these communication agreement.

S20 communication data can be divided into parameter data and non parameter data, the latter include running order, running status, running parameter and alarm information, etc.

一、First Communication setting

Set communication Baud rate through Ad-00 and Ad-01 set data format.

二、Second Agreement format as below



Appendix D Picture 1 MODBUS agreement format

三、Third Agreement format explain

1.Data type

All data use hexadecimal

2.Sub machine address

Set address of frequency transformer through Ad-02, 0 is broadcast address, sub machine address can be set at 1~247.

3.Read function code

Function code 03: represent that read function code of variable
Realized function: read running status, monitor parameter, failure information and function parameters of frequency transformer.

(1)Read parameter address distribution:

Function name	Address	Data and meanings
Running status	3000H	0001： forward running
		0002：reverse running
		0003：stop machine
Monitor parameters	1000H	Frequency/PID/ torque communication setting value (-10000~10000) (decade)
	1001H	Running frequency
	1002H	Bus line voltage
	1003H	Output voltage
	1004H	Output current
	1005H	Output power
	1006H	Output torque
	1007H	Running speed
	1008H	S terminal input mark

Function name	Address	Data and meanings
Monitor parameters	1009H	Do output terminal marks
	100AH	AI1 voltage
	100BH	Ai2 voltage
	100CH	Ai3 voltage
	100DH	Counting value input
	100EH	Length value input
	100FH	Load speed
	1010H	PID setting
	1011H	PID feedback
	1012H	PLC steps
	1013H	HD input pulse frequency, unit 0.01kHz
	1014H	Feedback speed, unit 0.01kHz
	1015H	Rest running time
	1016H	Ai1 voltage before calibrating
	1017H	Ai2 voltage before calibrating
	1018H	Ai3 voltage before calibrating
	1019H	Linear speed
	101AH	Current power one time
	101BA	Current running time
	101CH	HD input pulse frequency, unit 1Hz
	101DH	Communication setting value
	101EH	Actual feedback speed
	101FH	Main frequency A display
	1020H	Assist frequency B display
Failure	8000H	0000：no failure
		0001： IGBT short circuit failure
		0002： accelerate over current
		0003：moderate over current
		0004：constant speed over current
		0005： accelerate over voltage
		0006：moderate over voltage
		0007：constant speed over voltage
		0008：buffer electric resistance overload failure
		0009： lack voltage failure
		000A： frequency transformer overload
		000B：motor overload
		000C： input lack phase
		000D：output lack phase
		000E：module too hot
		000F：outer failure
		0010： communication abnormal

Function name	Address	Data and meanings
Failure	8000H	0011 : contactor abnormal
		0012 : current test failure
		0013 : motor harmonious failure
		0014 : coder/PG card failure
		0015 : parameters read and write abnormal
		0016 : frequency transformer hardware failure
		0017 : motor grounding short circuit failure
		0018 : remain
		0019 : remain
		001A : running time arrived
		001B: user self defined failure 1
		001C: user self defined failure 2
		001D: power on time arrived
		001E : load loss
		001F : PID feedback loss when running
		0028 : quickly limit current over time failure
		0029 : shift motor failure when running
		002A: too big speed deviation
		002B : motor over speed
		002D : motor over temperature
		005A : coder wire number setting error
		005B : not connect coder
		005C : initial position error
		005E : speed feedback error
Function parameters	Function code hexadecimal	Corresponding function code current value
	Are FX. YZ High byte address: FX Low byte address: YZ	
Function code group number	Communication visit address	
Group A0~AE	F000H~FEFFH If function code is AC21 then address means FC15H;	
Group Ap	1F00H~1F04H	
Group b0	A000H~A008H	
Group b1	A100H~A115H	
Group b5	A500H~A509H	
Group U0	0x7000~0x70FF	

☞ Attention: read parameter from frequency transformer all are hexadecimal, and number all are integer after ignored decimal point.

Attention: frequency transformer function parameter address are two parts high byte and lower byte, high byte means function parameter locate group serial number, low byte mean serial number in group of function parameters, need transfer to be hexadecimal.

(2) Communication frame content

Frame content of host computer send to frequency transformer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Read quantity high byte	Read quantity low byte	Check byte high byte	Check byte low byte

Frame content of frequency transformer responding to host computer:

Sub machine address	Function code	Read byte number	1st data high byte	1st data low byte	;;;;	n data high byte	n data low byte	Check byte high byte	Check byte low byte

(3) Sample

Host computer read 2 pieces data from frequency transformer such as running frequency and bus line voltage, the address are: 1001H, 1002H, then host computer need send the below data to frequency transformer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Read quantity high byte	Read quantity low byte	CRC check high byte	CRC check low byte
01	03	10	01	00	02	91	0B

Frequency transformer set frequency is 50.00Hz (corresponding hexadecimal is 1388H), bus line voltage 540.0V (corresponding hexadecimal is 1518H). Then frequency transformer feedback the below data to host computer: among, n=2 is quantity of read variable.

Sub machine address	Function code	Read byte number	1st data high byte	1st data low byte	2nd data high byte	2nd data low byte	CRC check high byte	CRC check low byte
01	03	04	13	88	15	18	70	07

4. Write operating function code

Function code 06: represent function code of write variable.

Realized functions: alter frequency transformer control order, frequency order, function parameters. Only can modify single frequency transformer parameters in one time.

(1) Write parameters address distribution:

Function name	Address	Data and meanings
Communication control order	2000H	0001 : forward running
		0002 : reverse running
		0003 : forward crawl
		0004 : reverse crawl
		0005 : freely stop machine
		0006 : moderate stop machine
		0007 : failure reset

Function name	Address	Data and meanings
Frequency/PID/ torque communication set frequency value address	1000H	0.00%~100.00%, set at 10000 (corresponding hexadecimal: 2710H), corresponding the max frequency or the max PID setting or the max torque.
Password address	IF00H	0.0%～100.0%
Password address	2001H	BIT0：remain BIT1：TA3-TC3 electric relay 3 output control BIT2：TA1-TB1-TC1 electric relay 1 output control BIT3：TA2-TC2 electric relay 2 output control BIT4：SP1 output control BIT5：XDO1 BIT6：XDO2 BIT7：XDO3 BIT8：XDO4 BIT9：XDO5
Fm1 output control	2002H	0～7FFF means 0%～100%
Fm2 output control	2003H	0～7FFF means 0%～100%
Pulse (HDI) Output control	2004H	0～7FFF means 0%～100%
Function code group number	Communication visit address	Communication modify function address in RAM
Group A0～AE	F000H~FEFFH If function code is AC. 21 then address represent as FC15H	F000H~FEFFH If function code is AC.21 then address represent as FC15H
Group Ap	1F00H～1F04H	0F00H～0F04H
Group b0	A000H～A008H	4000H～4008H
Group b1	A100H～A115H	4100H～4115H
Group b5	A500H～A509H	4500H～4509H

☞ Attention: frequently write EEPROM of function code parameters will reduce the working life, some parameters unable to storage under communication mode, only need modify the value in RAM then okay.

☞ Attention: communication setting value is percentage of relative value, 10000 corresponding to 100.00%, -10000 corresponding to -100.00%, for the data of frequency volume, this percentage ratio is percentage of relative max frequency (A0-10), for data of torque volume, this percentage is A2-10 (torque up limit digit setting)

(2) Communication frame content

Frame content of host computer send to frequency transformer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Read quantity high byte	Read quantity low byte	Check byte high byte	Check byte low byte

Frame content of frequency transformer respond to host computer: frequency transformer return same data to host computer.

(3) Sample

Sample 1: modify the accelerate time of frequency transformer to 30.0s through host computer, corresponding hexadecimal data 012CH, and power loss save this setting value. Accelerate time A0-17 corresponding hexadecimal address is: F011H.

Then host computer need send the below data to frequency transformer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC check high byte	CRC check low byte
01	06	F0	11	01	2C	EA	82

Then frequency transformer return the below data to host computer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC check high byte	CRC check low byte
01	06	F0	11	01	2C	EA	82

Sample 2: modify the moderate time of frequency transformer to 30.0s through host computer, corresponding hexadecimal data 012CH, but power loss not save this setting value. Then moderate time A0.18 corresponding hexadecimal address is: 0012H.

Then host computer need send the below data to frequency transformer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC check high byte	CRC check low byte
01	06	00	12	01	2C	29	82

Then frequency transformer return the below data to host computer:

Sub machine address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC check high byte	CRC check low byte
01	06	00	12	01	2C	29	82

5. CRC check

Hexadecimal CRC check which MODBUS-RTU, get check high byte, check low byte.
CRC check function as below:

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