

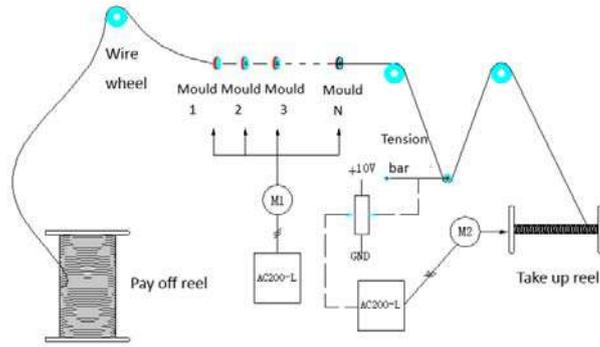
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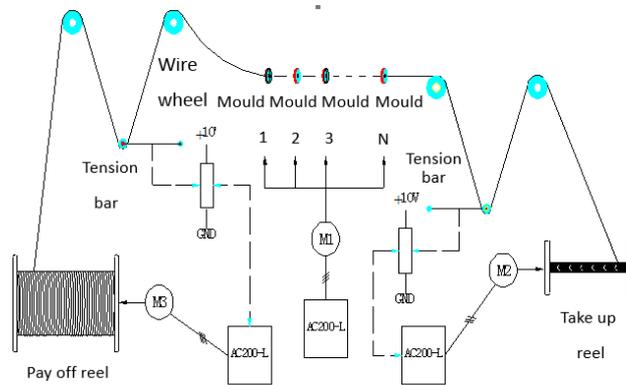
# 1.0 Schematic diagram and installation dimensions

## 1.1 Schematic diagram

The schematic diagram of the wire and cable winding and unwinding drawing machine is shown in Figure 1.1 (a) and (b). Generally, it is composed of main machine, stretching die, tension balance bar, wire take-up machine and wire arranging machine.



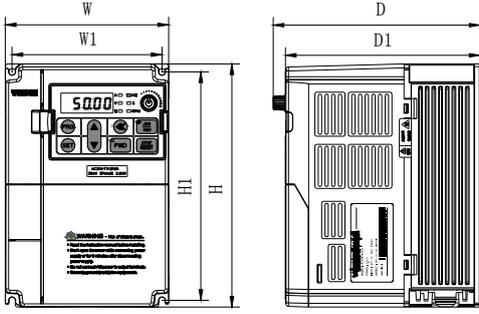
(a) Schematic diagram of drawing machine controlled by frequency conversion with constant tension take and passive pay off



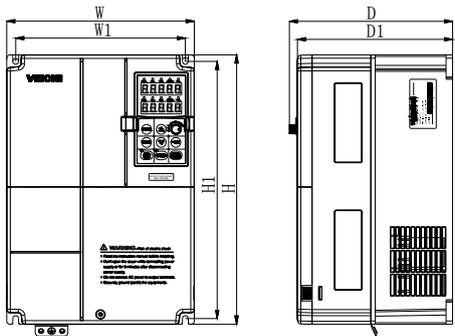
(b) Schematic diagram of active pay off constant tension take up variable frequency control wire drawing machine

Figure 1.1 Schematic diagram of rewinding and unwinding wire drawing machine

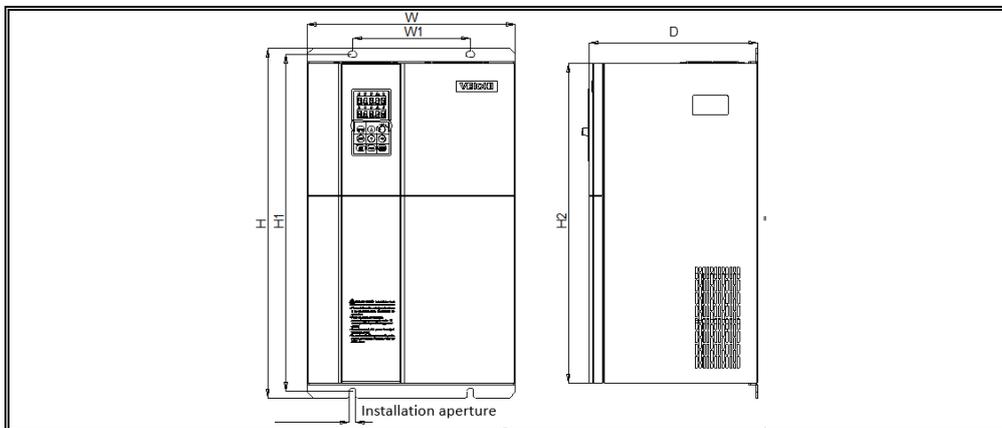
1.2 Installation dimensions of the inverter (unit: mm)



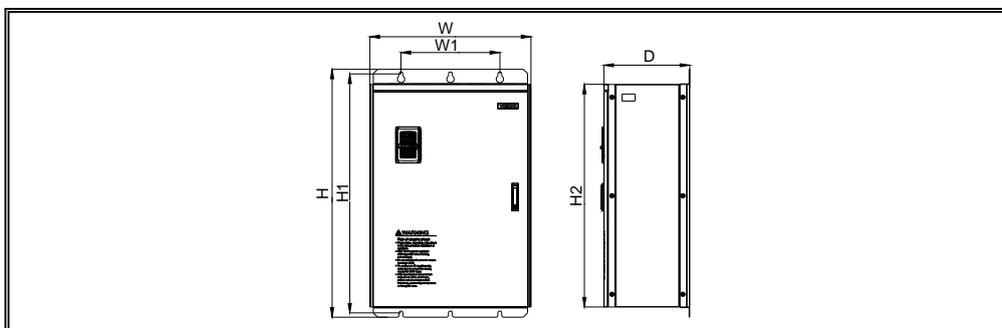
Inverter model	W	W1	H	H1	D	D1	Installation aperture
AC200-S2-R40L	122	112	182	171	154.5	145	φ5
AC200-S2-R75L							
AC200-S2-1R5L							
AC200-S2-2R2L	159	147.2	246	236	157.5	148	φ5.5
AC200-T3-R75L	122	112	182	171	154.5	145	φ5
AC200-T3-1R5L							
AC200-T3-2R2L							
AC200-T3-004L	159	147.2	246	236	157.5	148	φ5.5
AC200-T3-5R5L							
AC200-T3-7R5L	195	179	291	275	167.5	158	φ7
AC200-T3-011L							



Inverter model	Dimensions				Mounting hole		Installation aperture
	W	H	D	H2	W1	H1	
AC200-T3-015L	230	208	330	315	200	190	φ7
AC200-T3-018L							
AC200-T3-022L							



Inverter model	Dimensions				Mounting hole		Installation aperture
	W	H	D	H2	W1	H1	
AC200-T3-030L	255	410	225	370	180	395	φ7
AC200-T3-037L	305	570	260	522	180	550	φ9
AC200-T3-045L							
AC200-T3-055L							
AC200-T3-075L	380	620	290	564	240	595	φ11
AC200-T3-090L							
AC200-T3-110L							



Inverter model	Dimensions				Mounting hole		Installation aperture
	W	H	D	H2	W1	H1	
AC200-T3-132L	500	780	340	708	350	755	φ11
AC200-T3-160L	650	1060	400	950	400	1023	φ16
AC200-T3-185L							
AC200-T3-200L							
AC200-T3-220L	750	1170	400	1050	460	1128	φ18
AC200-T3-250L							
AC200-T3-280L							
AC200-T3-315L	850	1280	450	1150	550	1236	φ20
AC200-T3-355L							
AC200-T3-400L							

## 2.0 Working principle

This section takes the water tank type double frequency conversion wire drawing machine as an example to elaborate the control principle of the drawing and winding machine. The principle can also be applied to other constant tension control equipment. The difference between straight wire drawing machine and other constant tension control equipment is that the calculation part of winding diameter is reduced.

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The linear velocity of take-up and pay out is  $v = l * \omega * r = 2 \pi f * r = \pi * l * f * D$ , where  $f = l * V / \pi * D$ .  $F$  is the output frequency of the take-up frequency converter,  $l$  is the rotation ratio of the take-up and pay out machinery,  $V$  is the linear speed of the host, which is directly proportional to the output frequency of the host. The output frequency  $f$  of the take-up frequency converter is inversely proportional to the winding diameter  $D$  of the winding drum.

### 2.1 feedback polarity range detection

After the feedback value of tension balance bar is connected with the special frequency converter of ac200-I wire drawing machine as shown in Figure 1.1, move the tension bar according to the direction that the tension bar swings due to the take-up of the winding machine, and monitor the PID feedback signal (C-09). The value should change from small to large, generally 0.0% - 100.0%. If it is not in this range, the position of tension potentiometer should be changed so that the center point is about 50.0%. Tension potentiometers shall be 360 ° high precision. If the electrical adjustment is troublesome, you can also directly lift the tension bar to the Physical middle height position guaranteed by the take-up tension, and then set the feedback value of potentiometer to 50.0%. The purpose of this setting method is to ensure that the positive deviation and negative deviation of tension can be buffered by the tension bar with the same distance.

### 2.2 JOG inching leads

The frequency and acceleration and deceleration time of the main engine inching lead wire are independent of the normal operation frequency and acceleration and deceleration time. The jog frequency is jog frequency (f1.38), which is generally about 5.00 Hz. The inching acceleration time / inching deceleration time is f1.39/f1.40, and the recommended value is 10.0s.

### 2.3 Coil diameter calculation K value automatic calculation

With the increase of winding diameter, the output frequency of winding machine needs to be reduced. AC200-L series frequency converter is equipped with coil diameter calculation function, which can dynamically, real-time and automatically calculate the current winding diameter of winding machine, so as to achieve the best constant tension winding effect.

### 2.4 Mechanical transmission ratio

Mechanical transmission ratio: refers to the ratio of motor speed and drum speed. Calculation formula:

Mechanical transmission ratio = motor speed / drum speed

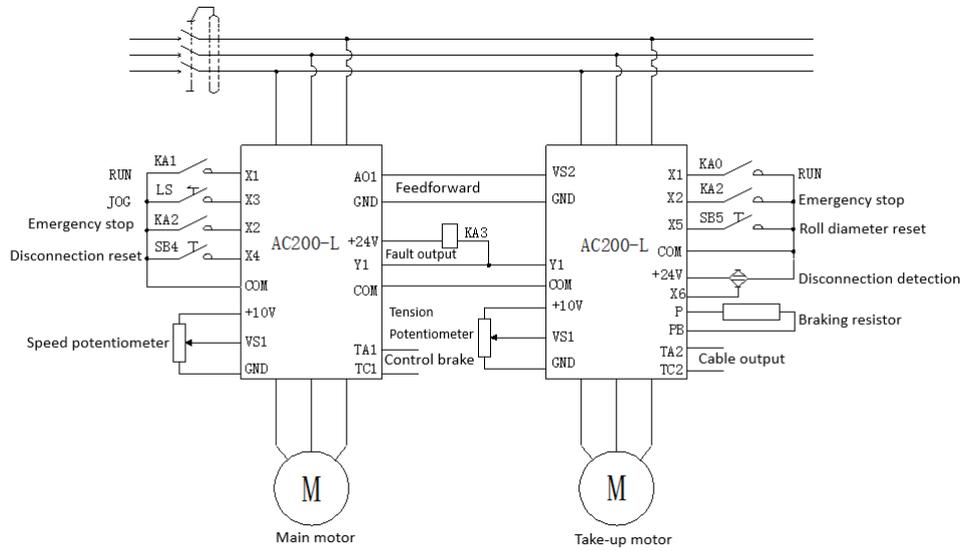
In the process of drawing, the mechanical transmission ratio will seriously affect the drawing effect, so the mechanical transmission ratio must be set correctly.

### 2.5 Coil diameter reset

Under the same linear speed, the speed difference between full diameter and empty diameter of take-up machine is large. In order to synchronize the wire speed between the take-up machine and the main machine, it is necessary to reset the winding diameter when changing the coil. When manual coil diameter reset function is used, external multi-function terminal (any one from X1 to X7) can be defined as coil diameter reset terminal.

### 2.6 Recommended control wiring

The inching switch is connected with X3 terminal of the host (factory value is inching forward rotation). The external terminal start switch is connected with the host x1. The wire speed potentiometer is connected with + 10V, VS1 and GND of the wire drawing machine (host). The analog output AO1 terminal and GND terminal of the host are connected with the vs terminal and GND terminal of the take-up machine. Short circuit the jumper terminal J2 on the control board. The potentiometer of tension bar is connected with + 10V, AI and GND terminals of ac200-I series frequency converter. The recommended wiring is shown in the following figure:



### 3.0 Function table

This chapter only provides a brief function list. For detailed function description, please refer to AC200 technical manual or consult our company.

- "-": this parameter can be changed when the frequency converter is running;
- "0": it means that the parameter cannot be changed when the frequency converter is running;
- "x": this parameter can only be read and cannot be changed;
- "-": indicates that the parameter is a "factory parameter", which is only set by the manufacturer;
- "\*": indicates that the parameter is related to the model of frequency converter;

#### Basic parameter group

NO.	Function description	Range of setting and definition	Factory default	Feature	Address
F0.00	Motor control method	Asynchronous motor control mode: 0: VF control 1: Reservation 2: Reservation 3: High performance vector control without PG 4: High performance vector control with PG Synchronous motor control mode: 5: Reservation 6: High performance vector control without PG	0	○	0x000

		7: Vector control with PG Other controls: 8: Voltage frequency separation output			
F0.01	Reserved				0x001
F0.02	Run command channel	0: keyboard control 1: terminal control 2: RS485 communication control 3: purchasing card	0	•	0x002
F0.03	Frequency given source channel A	0: given frequency of keyboard number 1: Keyboard potentiometer setting	0	•	0x003
F0.04	Frequency given source channel B	2: Voltage analog vs given 3: Current / voltage analog quantity AI setting 4: Current analog as setting 5: Terminal pulse pul setting 6: RS485 communication setting 7: Terminal up / DW control 8: PID control setting 9: Program control (PLC) setting 10: Special for wire drawing machine 11: Multi segment speed setting	1	•	0x004
F0.05	Frequency channel B reference source	0: take the maximum output frequency as the reference source 1: Take a set frequency as reference source	0	•	0x005
F0.06	Frequency given source selection	0: channel a 1: Channel B 2: Channel a + channel B 3: Channel a - channel B 4: Maximum value of channel A and channel B 5: Minimum value of channel A and channel B	0	•	0x006
F0.07	Run command bundle	Individual bit: keyboard command binding Ten bits: terminal command binding Hundred bit: communication command binding Kilobit: order binding of purchasing card 0: no binding 1: Keyboard number given frequency 2: Keyboard potentiometer setting 3: Voltage analog vs given 4: Current / voltage analog quantity AI setting 5: Current analog as setting 6: Terminal pulse pul setting 7: RS485 communication setting 8: Terminal up / DW control 9: PID control setting A: Program control (PLC) setting B: Purchase card C: Multi segment speed setting D: Reservation	0000	•	0x007
F0.08	Keyboard number setting frequency	0.00~ Upper limit frequency	50.00Hz	•	0x008
F0.09	Maximum frequency	Upper limit frequency~600.00Hz	50.00Hz	○	0x009
F0.10	Upper limit frequency	0: digital setting of upper limit frequency	0	•	0x00A

	source selection	1: Keyboard potentiometer setting 2: Voltage analog vs given 3: Current / voltage analog quantity AI setting 4: Current analog as setting 5: Terminal pulse pul setting 6: RS485 communication setting 7: Purchase card			
F0.11	Digital setting of upper limit frequency	Lower limit frequency~maximum frequency	50.00Hz	●	0x00B
F0.12	Lower limit frequency	0.00~Upper limit frequency	0.00Hz	●	0x00C
F0.13	Lower frequency operation mode	0: stop the output and enter the suspended operation state 1: Run at lower frequency	1	○	0x00D
F0.14	Acceleration time 1	0.01~650.00s	Model setting	※	0x00E
F0.15	Deceleration time 1	0.01~650.00s	Model setting	※	0x00F
F0.16	Rotation direction selection	LED bit: reverse operation direction 0: direction unchanged 1: Reverse direction Led 10 bits: operation direction forbidden 0: positive and negative commands are allowed 1: Only forward rotation command is allowed 2: Only reverse commands are allowed Led hundred bit: frequency control command direction 0: invalid frequency control direction 1: Effective frequency control direction Led kilobit: reserved	0000	○	0x010
F0.17-F0.18	Reserved				
F0.19	Parameter initialization	0: no operation 1: Restore factory value (do not restore motor parameters) 2: Restore factory value (restore motor parameters) 3: Clear fault record Other values: no operation	0	○	0x013

#### Operation control parameter group

NO.	Function description	Range of setting and definition	Factory default	Feature	Address
F1.00	Start operation mode	0: start by start frequency 1: DC brake first, then start from start frequency 2: Start up after speed tracking and direction judgment	0	○	0x100

F1.01	Starting pre excitation time	0.00~60.00s	0.00s	○	0x101
F1.02	Starting frequency	0.00~60.00Hz	0.50Hz	○	0x102
F1.03	Start frequency duration time	0.0~50.0s	0.0s	○	0x103
F1.04	Braking current before starting	0.0~150.0%	60.0%	○	0x104
F1.05	Braking time before starting	0.0~60.0s	0.0s	○	0x105
F1.06	Rotation speed tracking speed	0.00~60.00s	0.50s	○	0x106
F1.07	Speed tracking shutdown delay	0.00~60.00s	1.00s	○	0x107
F1.08- F1.09	Reserved				
F1.10	Stop mode	0: deceleration and shutdown 1: Free stop	0	●	0x10A
F1.11	Stop DC brake start frequency	0.00~50.00Hz	1.00Hz	○	0x10B
F1.12	Stop DC braking current	0.0~150.0%	60.0%		0x10C
F1.13	Reserved				0x10D
F1.14	DC braking duration of shutdown	0.0~60.0s	0.0s	○	0x10E
F1.15	Shutdown detection frequency	0.00~50.00Hz	0.50Hz	●	0x10F
F1.16	Acceleration and deceleration	LED bit: time reference selection 0: maximum frequency 1: Fixed frequency: 50 Hz 2: Set frequency LED 10 bit: s acceleration and deceleration selection 0: linear acceleration and deceleration 1: S curve acceleration and deceleration LED hundred: Reserved LED kilobit: Reserved	0010	○	0x110
F1.17	Acceleration start S-curve time	0.00~10.00	0.10s	○	0x111
F1.18	Acceleration end S-curve time	0.00~10.00	0.10s	○	0x112

F1.19	Deceleration start S-curve time	0.00~10.00	0.10s	○	0x113
F1.20	Deceleration end S-curve time	0.00~10.00	0.10s	○	0x114
F1.21	Acceleration time 2	0.01~650.00s	10.00s	●	0x115
F1.22	Deceleration time 2	0.01~650.00s	10.00s	●	0x116
F1.23	Acceleration time 3	0.01~650.00s	10.00s	●	0x117
F1.24	Deceleration time 3	0.01~650.00s	10.00s	●	0x118
F1.25	Acceleration time 4	0.01~650.00s	10.00s	●	0x119
F1.26	Deceleration time 4	0.01~650.00s	10.00s	●	0x11A
F1.27	Deceleration time of emergency stop	0.01~650.00s	1.00s	●	0x11B
F1.28	Dead time of forward and reverse rotation	0.0~120.0s	0.0s	○	0x11C
F1.29	Zero speed torque frequency threshold	0.00~10.00Hz	0.50Hz	●	0x11D
F1.30	Zero speed torque retention factor	0.0~150.0%	60.0%	●	0x11E
F1.31	Zero speed torque holding time	0.0~6000.0s When it is set to 6000.0 s, it is kept all the time	0	●	0x11F
F1.32- F1.34	Reserved				
F1.35	Action selection of power failure restart	0: invalid 1: Effective	0	○	0x123
F1.36	Waiting time for restart after power failure	0.00~60.00s	0.50s	○	0x124
F1.37	Reserved				0x125
F1.38	Jog operation frequency setting	0.00~Max frequency	5.00Hz	●	0x126
F1.39	JOG acceleration time	0.01~650.00s	10.00s	●	0x127
F1.40	JOG deceleration time	0.01~650.00s	10.00s	●	0x128

Parameter group of switch value terminal

NO.	Function description	Range of setting and definition	Factory default	Feature	Address
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F2.00	Multi function input terminal 1 (x1)	0: no function 1: Forward running 2: Reverse operation 3: Three wire operation control (Xl) 4: Forward turning and inching 5: Reverse jogging 6: Free parking 7: Emergency stop 8: Fault reset 9: External fault input 10: Frequency up 11: Frequency decline (DW)	34: acceleration and deceleration pause 35: swing frequency input 36: swing frequency pause 37: swing frequency reset 38: reserved 39: reserved 40: timer trigger terminal 41: timer reset terminal 42: counter clock input terminal 43: counter clearing terminal 44: DC brake command 45: pre excitation command terminal 46: motor selection terminal 47: reserved 48: command channel switches to keyboard 49: command channel switch to terminal 50: command channel switch to communication 51: command channel switch to expansion card 52: Operation forbidden 53: forward rotation prohibition 54: reversal prohibition 55: reserved 56: reserved 57: reserved 58: reserved 59: reserved 60: speed torque control switching 61: position control switching 62-79: reserved 80: coil diameter reset 81: coil diameter switching 82: broken wire fault input 83: meter reset	1	○	0x200
F2.01	Multi function input terminal 2 (x2)	12: Frequency increase decrease clear (up / DW clear) 13: Channel a switches to channel B 14: Frequency channel combination switch to a 15: Frequency channel combination switch to B		2	○	0x201
F2.02	Multi function input terminal 3 (x3)	16: Multi speed terminal 1 17: Multi speed terminal 2 18: Multi speed terminal 3 19: Multi speed terminal 4 20: PID control cancelled 21: PID control suspended 22: PID characteristic switching		4	○	0x202
F2.03	Multi function input terminal 4 (x4)	23: PID gain switching 24: PID given switch 1 25: PID given switch 2 26: PID given switch 3 27: PID feedback switch 1 28: PID switching feedback 28.2 29: PID feedback switching 3		5	○	0x203
F2.04	Multi function input terminal 5 (x5)	30: program running (PLC) pause 31: program run (PLC) restart 32: acceleration and deceleration time selection terminal 1 33: acceleration and deceleration time selection terminal 2		6	○	0x204
F2.05	Multi function input terminal 6 (x6)			8	○	0x205

F2.06	Multi function input terminal 7 (x7)		84: straight ahead main engine	10	○	0x206
F2.07	Reserved			0	○	0x207
F2.08	Selection of x1-x4 terminal characteristics	0: closed valid 1: Disconnection is effective Led bit: X1 terminal	LED 10 bits: x2 terminal LED hundred: X3 terminal LED kilobit: X4 terminal	0000	●	0x208
F2.09	Characteristic selection of X5 ~ X7 terminals	0: closed valid 1: Disconnection is effective LED bit: X5 terminal	LED 10 bits: X6 terminal LED hundred: X7 terminal LED kilobit: reserved	0000	●	0x209
F2.10	X1 effective detection delay	0.000~6.000s		0.010	●	0x20A
F2.11	X1 invalid detection delay	0.000~6.000s		0.010	●	0x20B
F2.12	X2 effective detection delay	0.000~6.000s		0.010	●	0x20C
F2.13	X2 invalid detection delay	0.000~6.000s		0.010	●	0x20D
F2.14	X3 effective detection delay	0.000~6.000s		0.010	●	0x20E
F2.15	X3 invalid detection delay	0.000~6.000s		0.010	●	0x20F
F2.16	X4 effective detection delay	0.000~6.000s		0.010	●	0x210
F2.17	X4 invalid detection delay	0.000~6.000s		0.010	●	0x211
F2.18	X5 effective detection delay	0.000~6.000s		0.010	●	0x212
F2.19	X5 invalid detection delay	0.000~6.000s		0.010	●	0x213
F2.20	X6 effective detection delay	0.000~6.000s		0.010	●	0x214

F2.21	X6 invalid detection delay	0.000~6.000s		0.010	●	0x215
F2.22	X7 effective detection delay	0.000~6.000s		0.010	●	0x216
F2.23	X7 invalid detection delay	0.000~6.000s		0.010	●	0x217
F2.24- F2.25	Reserved					
F2.26	Terminal control operation mode	0: two wire system 1 1: Two wire system 2	2: Three wire system 1 3: Three wire system 2	0	○	0x21 A
F2.27	Terminal starting protection	0: off 1: Open Led bit: terminal starting protection in case of abnormal exit LED 10 bit: start protection of inching terminal in case of abnormal exit LED 100 bit: start protection when command channel is switched to terminal LED kilobit: reserved		0111	○	0x21 B
F2.28- F2.29	Reserved					
F2.30	PUL input minimum frequency	0.00~50.00kHz		0.00kHz	●	0x21 E
F2.31	PUL Minimum frequency	0.00~100.00%		0.00%	●	0x21
F2.32	PUL Input maximum frequency	0.00~50.00kHz		50.00kHz	●	0x220
F2.33	PUL Maximum frequency corresponding	0.00~100.00%		100.00%	●	0x221
F2.34	PUL Filtering time	0.000~9.000s		0.100s	●	0x222
F2.35	PUL cut-off frequency	0.000~1.000kHz		0.010kHz	●	0x223
F2.36	Terminal UP / DW control selection	0: frequency power down storage 1: Frequency power failure does not store 2: It can be adjusted during operation and can be reset after shutdown		0	○	0x224
F2.37	Terminal up / DW controls frequency increase and decrease rate	0.01~50.00Hz/s		0.50 Hz/s	●	0x225
F2.38	Reserved					0x226
F2.39	Timer time unit	0: Second 1: minute 2: hour		0	●	0x227
F2.40	Timer settings	0~65000		0	●	0x228
F2.41	Counter maximum	0~65000		1000	●	0x229
F2.42	Counter setting value	0~65000		500	●	0x22
F2.43	Reserved					0x22
F2.44	Output terminal polarity	0: Positive		0000	●	0x22

	selection	1: Negative polarity LED bit: y terminal LED 10 bits: relay output terminal 1 LED hundred: relay output terminal 2 LED kilobit: reserved				C
F2.45	Output terminal 1	0: no output 1: Frequency converter in operation 2: Inverter in reverse operation 3: The frequency converter is running forward	18: PID feedback below lower limit 19: PID feedback sensor disconnection 20: Reservation	1	●	0x22 D
F2.46	Relay output 1	4: Fault trip alarm 1 (alarm during fault self recovery) 5: Fault trip alarm 2 (no alarm during fault self recovery) 6: External fault shutdown 7: Inverter under voltage 8: The inverter is ready for operation 9: Output frequency level detection 1 (fdt1) 10: Output frequency level detection 2 (fdt2) 11: Given frequency arrival 12: Zero speed operation 13: Upper frequency reached	21: timer time is up 22: the counter reaches the maximum value 23: the counter reaches the set value 24: energy consumption braking 25: PG feedback disconnection 26: emergency stop 27: load pre alarm output 1 28: load pre alarm output 2 29: motor overload warning 30: RS485 setting 31: reserved	4	●	0x22 E
F2.47	Relay output 2	14: Lower frequency reached 15: Program running cycle completed 16: The running stage of the program is completed 17: PID feedback exceeds upper limit	32: disconnection output 33: brake output 34: my arrival 35: water tank slave operation command	11	●	0x22 F
F2.48	Y1 output delay time	0.000~6.000s		0.010s	●	0x230
F2.49	Relay 1 output delay time	0.000~6.000s		0.010s	●	0x231
F2.50	Relay 1 output delay time	0.000~6.000s		0.010s	●	0x232

F2.51	Output frequency level 1 (FDT1)	0.00~Max frequency	30.00Hz	●	0x233
F2.52	FDT1 lagging	0.00~Max frequency	1.00Hz	●	0x234
F2.53	Output frequency level 2 (FDT2)	0.00~Max frequency	50.00Hz	●	0x235
F2.54	FDT2 lagging	0.00~Max frequency	1.00Hz	●	0x236
F2.55	The given frequency reaches the detection amplitude	0.00~50.00Hz	2.00Hz	●	0x237

#### Analog Terminal Parameter Group

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
F3.00	VS Lower limit	0.00V~10.00V	0.00V	●	0x300
F3.01	VS Lower limit corresponding setting	-100.00%~100.00%	0.00%	●	0x301
F3.02	VS upper limit	0.00V~10.00V	10.00V	●	0x302
F3.03	VS upper limit corresponding setting	-100.00%~100.00%	100.00%	●	0x303
F3.04	VS filter time	0.00s~6.00s	0.010s	●	0x304
F3.05	VS zero point loop voltage	0.00V~10.00V	0.00V	●	0x305
F3.06	AI (VS) lower limit	0.00V~10.00V	0.00V	●	0x306
F3.07	AI (VS) lower limit corresponding setting	0.00%~100.00%	0.00%	●	0x307
F3.08	AI used as VS upper limit	0.00V~10.00V	10.00V	●	0x308
F3.09	AI (VS) upper limit corresponding setting	0.00%~100.00%	100.00%	●	0x309
F3.10	AI filter time	0.00s~6.00s	0.010s	●	0x30A
F3.11	AS lower limit	0.00mA~20.00mA	4.00mA	●	0x30B
F3.12	AS lower limit corresponding setting	0.00%~100.00%	0.00%	●	0x30C
F3.13	AS upper limit	0.00mA~20.00mA	20.00mA	●	0x30D
F3.14	AS upper limit corresponding setting	0.00%~100.00%	100.00%	●	0x30E
F3.15	AS filter time	0.000s~6.000s	0.010s	●	0x30F
F3.16	AI used as AS lower limit	0.00mA~20.00mA	4.00mA	●	0x310
F3.17	AI (AS) lower limit corresponding setting	0.00%~100.00%	0.00%	●	0x311
F3.18	AI used as AS lower limit	0.00mA~20.00mA	20.00mA	●	0x312
F3.19	AI (AS) upper limit corresponding setting	0.00%~100.00%	100.00%	●	0x313

F3.20	Vs terminal function selection (used as X)	See X terminal function	0	○	0x314
F3.21	VS high level setting	0.00%~100.00%	70.00%	●	0x315
F3.22	VS low level setting	0.00%~100.00%	30.00%	●	0x316
F3.23	AI terminal function selection (used as X)	See X terminal function	0	○	0x317
F3.24	AI high level setting	0.00%~100.00%	70.00%	●	0x318
F3.25	AI low level setting	0.00%~100.00%	30.00%	●	0x319
F3.26	AS terminal function selection (as X)	See X terminal function	0	○	0x31A
F3.27	AS high level setting	0.00%~100.00%	70.00%	●	0x31B
F3.28	AS low level setting	0.00%~100.00%	30.00%	●	0x31C
F3.29	Valid state setting when analog used as terminal	0: low level 1: high level LED 0 digit: VS LED 00 digit: AI LED 000 digit: AS LED 0000 digit: reserved	0000	●	0x31D
F3.30	Analog input curve selection	LED "0" digit: VS 0: Beeline (default) 1: curve 1 2: curve 2 LED "00" digit: AI (Select voltage or current input by wire jumper) LED "000" digit: AS LED "0000" digit: reserved	0000	●	0x31E
F3.31	Reserved				0x31F
F3.32	Curve 1 lower limit	0.00V~10.00V	0.00V	●	0x320
F3.33	Curve 1 lower limit corresponding setting	0.00%~100.00%	0.0%	●	0x321
F3.34	Curve 1 inflection point 1 input voltage	0.00V~10.00V	3.00V	●	0x322
F3.35	Curve 1 inflection point1 corresponding setting	0.00%~100.00%	30.00%	●	0x323
F3.36	Curve 1 inflection point 2 input voltage	0.00V~10.00V	6.00V	●	0x324
F3.37	Curve 1 inflection point2 corresponding setting	0.00%~100.00%	60.00%	●	0x325
F3.38	Curve 1 upper limit	0.00V~10.00V	10.0V	●	0x326
F3.39	Curve 1 upper limit corresponding setting	0.00%~100.00%	100.00%	●	0x327
F3.40	Curve 2 lower limit	0.00V~10.00V	0.00V	●	0x328
F3.41	Curve 2 lower limit corresponding setting	0.00%~100.00%	0.00%	●	0x329
F3.42	Curve 2 inflection point 1 input voltage	0.00V~10.00V	3.00V	●	0x32A

F3.43	Curve 2 inflection point1 corresponding setting	0.00%~100.00%	30.00%	●	0x32B
F3.44	Curve 2 inflection point 2 input voltage	0.00V~10.00V	6.00V	●	0x32C
F3.45	Curve 2 inflection point2 corresponding setting	0.00%~100.00%	60.00%	●	0x32D
F3.46	Curve 2 upper limit	0.00V~10.00V	10.00V	●	0x32E
F3.47	Curve 2 upper limit corresponding setting	0.00%~100.00%	100.00%	●	0x32F
F3.48-F3.52		Reserved			0x330
F3.53	A0 output signal selection	LED "0" digit: A01 0: 0V~10V 1: 4.00mA~20.00mA 2: 0.00mA~20.00mA LED "00" digit: A02 0: 0V~10V 1: 4.00mA~20.00mA 2: 0.00mA~20.00mA 3: FM frequency pulse output LED "000" digit: reserved	0000	●	0x335
F3.54	A01 output selection	0: Given frequency 1: Output frequency 2: Output current 3: Input voltage 4: Output voltage 5: Machine speed 6: Given torque 7: Output torque 8: PID given value 9: PID feedback value	0	●	0x336
F3.55	A02 output selection	10: Output power 11: Bus voltage 12: VS input value 13: AI input value 14: AS input value 15: PUL input value 16: Module temperature 1 17: Module temperature 2 18: RS485 given	1	●	0x337
F3.56	A01 output gain	25.0%~200.0%	100.0%	●	0x338
F3.57	A01 output signal bias	-10.0%~10.0%	0.0%	●	0x339
F3.58	A01 output filter	0.000s~6.000s	0.010s	●	0x33A
F3.59	A02 output gain	25.0%~200.0%	100.0%	●	0x33B
F3.60	A02 analog output signal bias	-10.0%~10.0%	0.0%	●	0x33C

F3.61	A02 output filter	0.000s~6.000s	0.010s	●	0x33D
F3.62	A02FM frequency output lower limit	0.00kHz~100.00kHz	0.20kHz	●	0x33E
F3.63	A02FM frequency output upper limit	0.00kHz~100.00kHz	50.00kHz	●	0x33F
F3.64-F3.79		Reserved			

#### System Parameter Group

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
F4.00	Parameter and key lock selections	0: Not locked 1: Function parameter locked 2: Function parameter and key locked (except for RUN/STOP/JOG) 3: All function parameter and key locked	0	●	0x400
F4.01	User password	0~9999	0	●	0x401
F4.02-F4.03		Reserved			
F4.04	LCD keyboard language selection	0: Chinese 1: English	0	●	0x404
F4.05	Parameter copy	0: No function 1: Send inverter parameters to keyboard and save 2: Send keyboard parameters to inverter Remaining value: no operation	0	○	0x405
F4.06	Keyboard special function selection	LED 0 digit: DI E monitor on 0: Off 1: On LED 00 digit: no keyboard potentiometer lock sampling value 0: Off 1: On LED 000 digit: reserved LED 0000 digit: reserved	0000	○	0x406
F4.07	REV/JOG selection	0: REV 1: JOG	0	○	0x407
F4.08	STOP key setting	0: Non-keyboard control mode is invalid 1: Non-keyboard control mode stop according to stop mode 2: Non-keyboard control mode stop according to free mode	1	○	0x408
F4.09	UP/DOWN key selection	LED "0" digit: keyboard UN/DOWN key modify selection 0: Invalid 1: Modify frequency setting by key board	0011	○	0x409

		<p>numbers F0.08  2: Modify PID give setting by key board numbers Fb.01  LED "00" digit: power down save  0: No save frequency after power down  1: Save frequency after power down  LED "000" digit: action limit  0: Adjusting in operation &amp; stop  1: Adjusting only in operation, stop for holding  2: Adjusting in operation, stop for clearing  LED "0000" digit: reserved</p>			
F4.10	Keyboard potentiometer lower limit	0.00V~5.00V	0.50V	●	0x40A
F4.11	Keyboard potentiometer lower limit corresponding setting	0.00%~100.00%	0.00	●	0x40B
F4.12	Keyboard potentiometer upper limit	0.00V~5.00V	4.50V	●	0x40C
F4.13	Keyboard potentiometer upper limit corresponding setting	0.00%~100.00%	100.00	●	0x40D
F4.14	The display content of the first line in running state	<p>LED "0" and "00" digit: display the first group  00~63  LED "000" and "0000" digit: display the second group  00~63</p>	1101	●	0x40E
F4.15	The display content of the first line in running state	Same as above	0402	●	0x40F
F4.16	The display content of the first line in stop state	Same as above	1100	●	0x410
F4.17	The display content of the first line in stop state	Same as above	0402	●	0x411
F4.18	The display content of the second line in running state	Same as above	0402	●	0x412
F4.19	The display content of the second line in running state	Same as above	1210	●	0x413
F4.20	The display content of the second line in stop state	Same as above	0402	●	0x414
F4.21	The display content of the second line in stop state	Same as above	1210	●	0x415

F4.22	Keyboard display item setting	LED "0" digit: output frequency selection 0: Aim frequency 1: Running frequency LED "00" digit: reserved LED "000" digit: power display	0000	●	0x416
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#### Motor Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F5.00	Motor mode	0: Asynchronous motors (AM) 1: Permanent magnet synchronous motors (PM)	0	×	0x500
F5.01	Number of motor poles	2~98	4	○	0x501
F5.02	Motor rated power	0.1kW~1000.0kW	Model set	※	0x502
F5.03	Motor rated frequency	0.01Hz~max frequency	Model set	※	0x503
F5.04	Motor rated speed	1rpm~6500rpm	Model set	※	0x504
F5.05	Motor rated voltage	1V~1500V	Model set	※	0x505
F5.06	Motor rated current	0.1A~3000.0A	Model set	※	0x506
F5.07	Asynchronous motor no-load current	0.1A~3000.0A	Model set	※	0x507
F5.08	Asynchronous motor stator resistance	0.01%~50.00%	Model set	※	0x508
F5.09	Asynchronous motor rotor resistance	0.01%~50.00%	Model set	※	0x509
F5.10	Asynchronous motor stator leakage inductance	0.01%~50.00%	Model set	※	0x50A
F5.11	Asynchronous motor stator inductance	0.1%~2000.0%	Model set	※	0x50B
F5.12	synchronous motor stator resistance	0.01%~50.00%	Model set	※	0x50C
F5.13	Synchronous machine d axis inductance	0.01%~200.00%	Model set	※	0x50D
F5.14	Synchronous machine q axis inductance	0.01%~200.00%	Model set	※	0x50E
F5.15	Synchronous machine back EMF	1V~1500V	Model set	※	0x50F
F5.16	Synchronous machine encoder installation angle	0.0°~360.0°	Model set	※	0x510
F5.17-F5.19		Reserved			0x511
F5.20	Motor parameters self-adjustment selections	0: No operation 1: Rotary type self-study 2: Static type self-study 3: Reserved	0	○	0x514

F5.21	Synchronous machine poles searching function	LED "0" digit: closed-loop vector 0: OFF 1: ON 2: On, only operate firstly when electrify LED "00" digit: open-loop vector 0: OFF 1: ON 2: ON, only operate firstly when electrify	0010	○	0x515
F5.22-F5.29		Reserved			0x516
F5.30	Speed feedback or encoder mode	LED "0" digit: encoder mode 0: Common ABZ encoder 1: Rotary encoder LED "00" digit: encoder direction 0: same direction 1: reverse direction LED "000" digit: wire break inspection 0: OFF 1: ON LED "0000" digit: Z pulse correction enabled 0: OFF 1: ON	0000	○	0x51E
F5.31	ABZ encoder lines	0-10000	1024	○	0x51F
F5.32	wire break inspection time	0.100s~60.000s	2.000s	●	0x520
F5.33	Rotary encoder poles	2~128	2	○	0x521
F5.34-F5.35		Reserved	1	○	0x522
F5.36	First-order filter of encoder speed inspection	0.0ms~100.0ms	1.0ms	●	0x524
F5.37-F5.49		Reserved			

#### Motor VC Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F6.00	ASR(speed loop) proportional gain 1	0.01~100.00	10.00	●	0x600
F6.01	ASR integral time 1	0.000s~6.000s	0.500s	●	0x601
F6.02	ASR filter time1	0.0ms~100.0ms	0.0ms	●	0x602
F6.03	ASR switch frequency 1	0.00Hz~Max frequency	0.00Hz	●	0x603
F6.04	ASR (speed loop) proportional gain 2	0.01~100.00	10.00	●	0x604
F6.05	ASR (speed loop) integral time 2	0.000s~6.000s	0.500s	●	0x605
F6.06	ASR filter time 2	0.0ms~100.0ms	0.0ms	●	0x606
F6.07	ASR switch frequency 2	0.00Hz~Max frequency	5.00Hz	●	0x607

F6.08	Electric motor torque limit	0.0%~250.0%	180.0%	●	0x608
F6.09	Power generation torque limit	0.0%~250.0%	180.0%	●	0x609

#### Protection and Malfunction Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
FA.00	OC suppression function	0: Suppression valid 1: ACC/DEC valid, constant speed invalid	0	●	0xA00
FA.01	OC suppression point	0.0%~300.0%	160.0%	●	0xA01
FA.02	OC suppression gain	0.0%~500.0%	100.0%	●	0xA02
FA.03	Current hardware protection settings	LED "0" digit: (CBC) 0: Off 1: On LED "00" digit: OC protection interference suppression 0: Off 1: First grade interference suppression 2: Second grade interference suppression LED "000" digit: SC protection First grade interference suppression 0: Off 1: First grade interference suppression 2: Second grade interference suppression LED "0000" digit: Reserved	0001	○	0xA03
FA.04	Reserved				0xA04
FA.05	Bus over voltage hardware protection	0: Off 1: On	1	○	0xA05
FA.06	Bus over voltage suppression function	LED "0" digit: Over voltage suppression control 0: Prohibited 1: Valid in DEC 2: Valid both in ACC/DEC LED "00" digit: Over-excitation control 0: Off 1: On LED "000" digit: Reserved LED "0000" digit: Reserved	0012	○	0xA06
FA.07	Bus over voltage suppression point	110.0%~150.0%	128.0%	※	0xA07
FA.08	Bus over voltage suppression gain	0.0%~500.0%	100.0%	●	0xA08
FA.09	Bus under voltage suppression function	0: Prohibited 1: Valid	0	○	0xA09

FA.10	Bus under voltage suppression point	60.0%~90.0%	80.0%	※	0xA0A
FA.11	Bus under voltage suppression gain	0.0%~500.0%	100.0%	●	0xA0B
FA.12	Bus under voltage protection point	60.0%~90.0%	60.0%	※	0xA0C
FA.13	Reserved				0xA0D
FA.14	Earth short-circuit detection after power on	0: Off 1: On	0	○	0xA0E
FA.15	Loss phase protection	LED "0" digit: Output loss phase protection 0: Off 1: On LED "00" digit: Input loss phase protection 0: Off 1: Open the alarm 2: Open the fault LED "000" digit: Reserved LED "0000" digit: Reserved	0011	○	0xA0F
FA.16	Motor overload protection curve coefficient	0.0%~250.0%	100.0%	○	0xA10
FA.17	Load pre alarm detection setting	LED "0" digit: Detection selection (protection 1) 0: Not detected 1: Detected load is too large 2: Detected load is too large only at constant speed 3: Insufficient load detected 4: Insufficient load only at constant speed LED "00" digit: Alarm selection 0: Alarm and continue operation 1: Fault protection and free stop LED "000" digit: Detection selection (protection 2) 0: Not detected 1: Detected load is too large 2: Detected load is too large only at constant speed 3: Insufficient load detected 4: Insufficient load only at constant speed LED "0000" digit: Alarm selection 0: Alarm and continue operation 1: Fault protection and free stop	0000	○	0xA11

FA.18	Load pre alarm detection level 1	0.0%~200.0%	130.0%	○	0xA12
FA.19	Load pre alarm detection time 1	0.0s~60.0s	5.0s	○	0xA13
FA.20	Load pre alarm detection level 2	0.0%~200.0%	30.0%	○	0xA14
FA.21	Load pre alarm detection time 2	0.0s~60.0s	5.0s	○	0xA15
FA.22	Reserved				0xA16
FA.23	Protection action when speed slip is too large	LED "0" digit: Detection selection 0: Not detected 1: Detected at constant speed 2: Detecting LED "00" digit: Alarm selection 0: Free stop and report fault 1: Alarm and continue operation LED "000" digit: Reserved LED "0000" digit: Reserved	0000	○	0xA17
FA.24	detection threshold when speed slip is too large	0.0%~60.0%	10.0%	○	0xA18
FA.25	detection time when speed slip is too large	0.0s~60.0s	2.0s	○	0xA19
FA.26	Stall protection action	LED "0" digit: Detection selection 0: Not detected 1: Detected at constant speed 2: Detecting LED "00" digit: Alarm selection 0: Free stop and report fault 1: Alarm and continue running LED "000" digit: Reserved LED "0000" digit: Reserved	0000	○	0xA1A
FA.27	Stall detection threshold	0.0%~150.0%	110.0%	○	0xA1B
FA.28	Stall detection time	0.000s~2.000s	0.010s	○	0xA1C
FA.29-FA.36		Reserved			0xA1D
FA.37	Malfunction self-recovery times	0~5	0	○	0xA25
FA.38	Malfunction self-recovery interval	0.1s~100.0s	1.0s	○	0xA26
FA.39	Malfunction diagnosis information	See fault code table	--	×	0xA27
FA.40	Malfunction types	See fault code table	--	×	0xA28

FA.41	Malfunction running frequency	0.00Hz~Max frequency	--	×	0xA29
FA.42	Malfunction output voltage	0V~1500V	--	×	0xA2A
FA.43	Malfunction output current	0.1A~2000.0A	--	×	0xA2B
FA.44	Malfunction bus voltage	0V~3000V	--	×	0xA2C
FA.45	Malfunction module temperature	0°C~100°C	--	×	0xA2D
FA.46	Malfunction machine state	LED "0" digit: Running direction 0: FWD 1: REV LED "00" digit: Running status 0: Stop 1: ACC 2: DEC 3: Constant speed LED "000" digit: Reserved LED "0000" digit: Reserved	--	×	0xA2E
FA.47	Malfunction input terminal status	See input terminal chart	--	×	0xA2F
FA.48	Malfunction output terminal status	See output terminal chart	--	×	0xA30
FA.49	The last malfunction types	Please see malfunction code table	--	×	0xA31
FA.50	The last malfunction running frequency	0.00Hz~Max frequency	--	×	0xA32
FA.51	The last malfunction output voltage	0V~1500V	--	×	0xA33
FA.52	The last malfunction output current	0.1A~2000.0A	--	×	0xA34
FA.53	The last malfunction bus voltage	0V~3000V	--	×	0xA35
FA.54	The last malfunction module temperature	0°C~100°C	--	×	0xA36
FA.55	The last machine state	LED "0" digit: Running direction 0: FWD 1: REV LED "00" digit: Running status 0: Stop 1: Constant speed 2: ACC 3: DEC LED "000" digit: Reserved LED "0000" digit: Reserved	--	×	0xA37
FA.56	The last malfunction input terminal state	See input terminal chart	--	×	0xA38

FA.57	The last malfunction output terminal state	See output terminal chart	--	×	0xA39
FA.58	The first two malfunction types	Please see malfunction code table	--	×	0xA3A
FA.59	The first three malfunction types	Please see malfunction code table	--	×	0xA3B

#### PID Process Control Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
Fb.00	PID controller given signal source	0: Keyboard digit PID given 1: Keyboard potentiometer given 2: Terminal VS voltage analog given 3: Terminal AI voltage and current analog given 4: Terminal AS current analog given 5: Terminal pulse PUL given 6: RS485 communication given 7: Optional card 8: Terminal selection	0	●	0xB00
Fb.01	Keyboard digit PID given/feedback	0.00%~100.0%	50.0%	●	0xB01
Fb.02	PID given changing time	0.00s~60.00s	1.00s	●	0xB02
Fb.03	PID controller feedback signal source	0: Keyboard digit PID given 1: Keyboard potentiometer given 2: Terminal VS voltage analog given 3: Terminal AI voltage and current analog given 4: Terminal AS current analog given 5: Terminal pulse PUL given 6: RS485 communication given 7: Optional card 8: Terminal selection	2	●	0xB03
Fb.04	Feedback signal filter time	0.000s~6.000s	0.010s	●	0xB04
Fb.05	Feedback signal gain	0.00~10.00	1.00	●	0xB05
Fb.06	Given and feedback range	0~100.0	100.0	●	0xB06
Fb.07	PID control selection	LED "0" digit: Feedback feature selection 0: Positive feature 1: Negative feature LED "00" digit: Reserved LED "000" digit: Reserved LED "0000" digit: Differential adjustment properties 0: Differential of deviation 1: Differential of feedback	0100	●	0xB07

Fb.08	PID preset output	0.0%~100.0%	100.0%	●	0xB08
Fb.09	PID preset output running time	0.0s~6500.0s	0.0s	●	0xB09
Fb.10	PID control deviation limit	0.0%~100.0%	0.0%	●	0xB0A
Fb.11	Proportional gain P1	0.000~8.000	0.100	●	0xB0B
Fb.12	Integral time I1	0.0s~600.0s	1.0s	●	0xB0C
Fb.13	Differential gain D1	0.000s~6.000s	0.000s	●	0xB0D
Fb.14	Proportional gain P2	0.000~8.000	0.100	●	0xB0E
Fb.15	Integral time I2	0.0s~600.0s	1.0s	●	0xB0F
Fb.16	Differential gain D2	0.000s~6.000s	0.000s	●	0xB10
Fb.17	PID parameter switching condition	0: No switch 1: Use DI terminal to switch 2: Switch according to deviation	0	●	0xB11
Fb.18	Low value of switching deviation	0.0%~100.0%	20.0%	●	0xB12
Fb.19	High value of switching deviation	0.0%~100.0%	80.0%	●	0xB13
Fb.20	Reserved				0xB14
Fb.21	Differential limit	0.0%~100.0%	5.0%	●	0xB15
Fb.22	PID output upper limit	0.0%~100.0%	100.0%	●	0xB16
Fb.23	PID output lower limit	-100.0%~Fb.19	0.0%	●	0xB17
Fb.24	PID output filter time	0.000s~6.000s	0.000s	●	0xB18

#### Communication Control Function Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
Fd.00	Main-slave machine selection	LED "0" digit: Modbus main-slave selection 0: Slave machine 1: Main machine LED "00" digit: reserved LED "000" digit: reserved LED "0000" digit: reserved	0000	○	0xD00
Fd.01	485 communication address	1~247	1	○	0xD01
Fd.02	Communication baud rate selection	LED "0" digit: 485 communication 0: 1200 bps 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: 19200 bps 5: 38400 bps LED "00" digit: reserved LED "000" digit: reserved LED "0000" digit: reserved	0003	○	0xD02

Fd.03	Modbus data format	0: (N,8,1) format 1: (E,8,1) format 2: (O,8,1) format 3: (N,8,2) format 4: (E,8,2) format 5: (O,8,2) format	0	○	0xD03
Fd.04	Communication ratio setting	0.00~5.00	1.00	●	0xD04
Fd.05	Modbus communication answer delay	0ms~500ms	0ms	●	0xD05
Fd.06	Modbus communication overtime fault time	0.1s~100.0s	1.0s	●	0xD06
Fd.07	Modbus communication fault action mode selection	0: No checkout overtime fault 1: Alarm and stop freely 2: Alarm and continue running 3: Forced stop	0	●	0xD07
Fd.08	Modbus transmission response dispose	0: Write operation with response 1: Write operation without response	0	●	0xD08
Fd.09	Main machine sending selection	LED "0" digit: the first group transmitting frame selection 0: Invalid 1: Main machine run command 2: Main machine given frequency 3: Main machine output frequency 4: Main machine upper limit frequency 5: Main machine given torque 6: Main machine output torque 7: Torque control FWD speed limit 8: Torque control REV speed limit 9: Main machine given PID A: Main machine feedback PID B: Reserved LED "00" digit: the second group transmitting frame selection Same as above LED "000" digit: the third group transmitting frame selection Same as above LED "0000" digit: the fourth group transmitting frame selection Same as above	0031	●	0xD09
Fd.10	RS485 communication port configuration	0: Modbus communication 1: serial port communication	0	●	0xD0A

## Special function parameter group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
FF.00	Control selection of wire drawing machine	0~3	0	○	0xF00
FF.01	Maximum frequency of main engine	0.00~320.00Hz	50.00Hz	○	0xF01
FF.02	Maximum linear speed of main engine	0.1~3200.0m/min	1470.0m/min	○	0xF02
FF.03	Set the number of meters	0~32000 (100m)	1200	●	0xF03
FF.04	Mechanical transmission ratio	0.01~300.00	1.00	○	0xF04
FF.05	Drum diameter 1	1~10000mm	200mm	○	0xF05
FF.06	Drum diameter 2	1~10000mm	100mm	○	0xF06
FF.07	Filtering time of coil diameter calculation	0.00~10.00s	0.50s	●	0xF07
FF.08	Minimum linear velocity of coil diameter calculation	0.1~3200.0m/min	200.0m/min	●	0xF08
FF.09	Reserved				0xF09
FF.10	PID limiting amplitude	0.00~320.00Hz	10.00Hz	●	0xF0A
FF.11	Switching frequency 1	0.00~Max frequency	5.00Hz	●	0xF0B
FF.12	Switching frequency 2	0.00~Max frequency	20.00Hz	●	0xF0C
FF.13	Overshoot suppression function	0~1	1	●	0xF0D
FF.14	Overshoot suppression function	0.1~3200.0m/min	200.0m/min	●	0xF0E
FF.15	Upper limit overshoot suppression rate	0.1~300.0%	120.0%	●	0xF0F
FF.16	Lower limit overshoot suppression rate	0.1~300.0%	50.0%	●	0xF10
FF.17	Reserved				0xF11
FF.18	Synchronous speed gain	-100.00%~+100.00%	0.00%	●	0xF12
FF.19	Disconnection detection method	0~2	1	○	0xF13
FF.20	PID disconnection detection lower limit	0.0~20.0%	10.0%	●	0xF14
FF.21	PID disconnection detection upper limit	80.0~100.0%	90.0%	●	0xF15

FF.22	Disconnection detection start delay	0.0~20.0S	5.0s	●	0xF16
FF.23	Minimum frequency of disconnection detection	0.00~20.00Hz	10.00Hz	●	0xF17
FF.24	Disconnection detection judgment delay	0.0~10.0s	2.0s	●	0xF18
FF.25	Disconnection fault action mode	0~1	1	○	0xF19
FF.26	Disconnection fault reset selection	0~1	1	○	0xF1A
FF.27	Automatic reset time of disconnection fault	0.1~30.0s	5.0s	●	0xF1B
FF.28	Braking frequency	0.00~50.00Hz	1.50Hz	●	0xF1C
FF.29	Braking time	0.1~30.0s	5.0s	●	0xF1D
FF.30	Meter counting method	0~2	0	○	0xF1E
FF.31	Reserved				0xF1F
FF.32	Meter arrival control	0~1	0	○	0xF20
FF.33	PUL meter step length	0~32000mm	150mm	●	0xF21
FF.34	Coil diameter reset selection	0~1	0	●	0xF22
FF.35	Calculation of K value by straight forward slave	0~300.00	100.00	●	0xF23
FF.36- FF.38	Reserved				
FF.39	Set weight	0.1~3200.0kg	50.0kg	●	0xF27
FF.40	Weight arrival control	0~1	0	○	0xF28
FF.41	Wire diameter	0.010~6.000mm	0.200mm	●	0xF29
FF.42	Material density	0.00~30.00g/cm <sup>3</sup>	7.87 g/cm <sup>3</sup>	●	0xF2A
FF.33	Reserved				0xF2B
FF.44	Smooth start function	0~1	0	●	0xF2C
FF.45	Upper limit of smoothing coefficient	0.0%~300.0%	120.0%	●	0xF2D
FF.46	Lower limit of smoothing coefficient	0.0%~300.0%	50.0%	●	0xF2E
FF.47	Reserved				0xF2F
FF.48	K value limiting at smooth start	0.00%~50.00%	5.00%	●	0xF30

FF.49	Smooth start exit time	0.00s~600.00s	4.00	●	0xF31
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Note for other parameters of AC200 series variable frequency governor, please refer to the manual.

## 4.0 Detailed description of function parameters

### 4.1 Detailed description of switch terminal parameter group

F2.00	Multi-function input terminal 7 (X1)	Range: 0 ~ 84	Factory default: 1
F2.01	Multi-function input terminal 7 (X2)	Range: 0 ~ 84	Factory default: 2
F2.02	Multi-function input terminal 7 (X3)	Range: 0 ~ 84	Factory default: 4
F2.03	Multi-function input terminal 7 (X4)	Range: 0 ~ 84	Factory default: 6
F2.04	Multi-function input terminal 7 (X5)	Range: 0 ~ 84	Factory default: 8
F2.05	Multi-function input terminal 7 (X6)	Range: 0 ~ 84	Factory default: 10
F2.06	Multi-function input terminal 7 (X7)	Range: 0 ~ 84	Factory default: 0

This machine has 7 multi-function input terminals, The functions of the multi-function input terminals (X1-X7) can be defined by the parameters [F2.00~F2.06]. The characteristics of the multi-function input terminal and the detection delay time can be set through the parameters [F2.08~F2.23], see the parameters [F2.08~F2.11] for details.

The multi-function input terminal has rich functions, which can be conveniently set and selected according to needs. See the table below for settings and functions:

Set value	Definition	Set value	Definition
80	Roll diameter reset	83	Meter reset
81	Roll diameter switch	84	Direct host
82	Disconnection fault input		

**80:** Roll diameter reset When this terminal is valid, the inverter will restore the coil diameter value to the initial coil diameter value; Initial curling radius value = curling radius value calculated by mechanical parameters (C-41) + FF.18

**81:** Roll diameter switch This terminal can switch between reel diameter 1 and reel diameter 2. The switching is valid only when the machine is stopped, please reset the winding diameter after switching.

**82:** Disconnection fault input Through this terminal, an external disconnection signal can be input, which is convenient for the inverter to monitor and protect the disconnection of external equipment. After the inverter receives the external disconnection input signal, after a delay of [FF.24], the fault signal is always valid, that is, it is confirmed as a disconnection fault, press [FF.25] for processing.

**83:** Meter reset The terminal is effective at the moment of closing, and the meter counting record of the meter counter is cleared. When this terminal is valid, the feedforward frequency is directly given to the given frequency, and the PID adjustment is stopped at the same time. The terminal cut-in is invalid during operation.

**84:** Direct host When this terminal is valid, the feedforward frequency is directly given to the given frequency, and the PID adjustment is stopped at the same time. The terminal cut-in is invalid during operation.

F2.45	Output terminal Y	Predetermined area: 0~35	Factory default: 1
F2.46	Relay output terminal (TA1-TB1-TC1)		Factory default: 4
F2.47	Relay output terminal (TA2-TB2-TC2)		Factory default: 11

**32:** Disconnection output When detecting a disconnection, a valid signal is output. Output when disconnection alarm, stop after reset.

**33:** Brake output When the slave inverter stops, it outputs a brake signal. After [FF.29] time, the output signal is stopped.

**34:** Count the meters to arrive When the meter counter reaches the set value, the output terminal outputs a valid signal. Stop output after the meter is reset.

35: Water tank slave running command There is no signal during jog, only output during running. When the output frequency is less than [FF.28] brake action frequency during stop, the output will stop.

36: Weight reached When the weight reaches the set value, the output terminal will output a valid signal, and the output will stop after reset.

Detailed description of process PID control parameters

Fb.11	Proportional gain P1	Predetermined area: 0.000~9.999	Factory default: 0.500
Fb.12	Integration time I1	Predetermined area: 0.0~600.0s	Factory default: 1.0s
Fb.13	Differential gain D1	Predetermined area: 0.000~6.000s	Factory default: 0.000s
Fb.14	Proportional gain P2	Predetermined area: 0.000~9.999	Factory default: 0.100
Fb.15	Integration time I2	Predetermined area: 0.0~600.0s	Factory default: 1.0s
Fb.16	Differential gain D2	Predetermined area: 0.000~6.000s	Factory default: 0.000s

The adjustment parameters of the PID controller should be adjusted according to the actual system characteristics. PID parameter group 1 (Fb.11~Fb.13), PID parameter group 2 (Fb.14~Fb.16), use [Fb.17] function code to select the conditions for switching between two groups of PID parameters.

**Proportional gain:** Decide the adjustment intensity of the entire PID regulator. The greater the gain, the greater the adjustment intensity, but too large an oscillation is likely to occur.

**Integration time:** Determine the intensity of PID regulator integral adjustment. The shorter the integration time, the greater the adjustment intensity.

**Differential gain:** Determine the intensity of the PID regulator to adjust the deviation or the rate of change of the feedback signal. Use [Fb.07] Thousands to select the differential adjustment attribute; the longer the differential time, the greater the adjustment intensity. The function of differential adjustment is to adjust according to the changing trend when the feedback signal changes, thereby suppressing the change of the feedback signal.

Fb.17	PID parameter switching conditions	Predetermined area: 0~3	Factory default: 0
Fb.18	Low switching deviation	Predetermined area: 0.0~100.0%	Factory default: 20.0%
Fb.19	High switching deviation	Predetermined area: 0.0~100.0%	Factory default: 80.0%

In some applications, a set of PID adjustment parameters cannot meet the needs of the entire process, and different PID parameter sets need to be used in different situations.

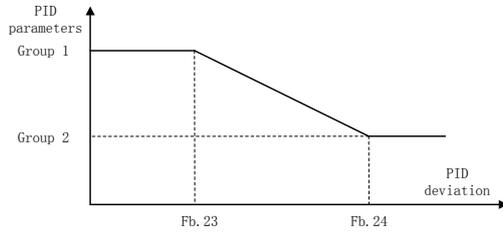
PID parameter switching conditions:

0: No switch PID parameter selection PID parameter group 1 (Fb.11~Fb.13) .

1: Use DI terminal to switch Multi-function terminal function selection should be set to 23 (PID parameter switching), when the terminal is invalid, select PID parameter group 1 (Fb.11~Fb.13), when the terminal is valid, select PID parameter group 2 (Fb.14~Fb.16) .

2: Switch based on deviation When the absolute value of the deviation between PID reference and feedback is less than [Fb.18], PID parameter selection parameter group 1; when the absolute value of the deviation between PID reference and feedback is greater than [Fb.19], PID parameter selection parameter group 2; when the absolute value of the deviation between PID reference and feedback is at the switching deviation low value [ Between Fb.18] and the switching deviation high value [Fb.19], the PID parameters are the linear interpolation values of the two sets of PID parameters, as shown in the figure below.

3: Switch according to operating frequency When the output frequency is lower than [FF.11], the PID parameter selects parameter group 1; when the output frequency is greater than [FF.12], the PID parameter selects parameter group 2; when the output frequency is between [Fb.11] and [Fb. 12], the PID parameters are linear interpolation values of the two groups of PID parameters, refer to the above to switch according to the deviation.



Schematic diagram of switching PID parameters according to deviation

#### 4.2 Detailed description of special function parameters

FF.00	Wire drawing machine control options	Predetermined area: 0~3	Factory default: 0
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Set the control type of the wire drawing machine. After the control type of the wire drawing machine is selected, some default parameters will change accordingly. For details, see the appendix:

0: invalid

1: Water tank host

2: Rewinding of water tank

3: Straight wire drawing machine

FF.01	Host frequency	Predetermined area:0.00~320.00Hz	Factory default:50.00 Hz
FF.02	Maximum line speed of host	Predetermined area:0.1~3200.0m/min	Factory default:1470.0 m/min

Maximum host frequency: The setting is the same as the maximum frequency of the host.

Note: When set as the water tank host, the frequency value of the maximum frequency F0.09 is automatically read.

Maximum line speed of host: The maximum frequency of the host corresponds to the maximum linear speed. In the meter calculation, the converted linear velocity is used to meter the meter.

FF.03	Set the number of meters	Predetermined area:0~32000 (100m)	Factory default:1200
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Set the number of meters: The set number of meters, the unit is 100m; if it is set to 1200, the actual set number of meters is 120000m.

When the drawing meter value reaches the value set in [FF.31], Output the effective signal at the corresponding output terminal (the output terminal is selected by [F2.45~F2.47], The value of the drawing meter can be cleared to zero through the counter clear terminal set by the multi-function input terminal [F2.00~F2.06] at any time.

FF.04	Mechanical transmission ratio	Predetermined area:0.01~300.00	Factory default:1.00
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Mechanical transmission ratio: It refers to the ratio of motor speed to reel speed. Calculation formula: mechanical transmission ratio = motor speed/reel speed. In the process of drawing, the mechanical transmission ratio will seriously affect the drawing effect, and the mechanical transmission ratio must be set correctly.

FF.05	Reel diameter 1	Predetermined area: 1~10000mm	Factory default:200
FF.06	Reel diameter 2	Predetermined area: 1~10000mm	Factory default:100

Reel diameter: Refers to the diameter of the reel of the wire drawing machine when it is empty. The switch between [FF.05] reel diameter 1 and [FF.06] reel diameter 2 can be realized through the multifunctional input terminal. When the reel diameter switching terminal is invalid, the default is [FF.05] reel diameter 1, and when the terminal is valid, it switches to [FF.06] reel diameter 2.

Note: After switching, it will take effect after the coil diameter is reset. You can check the monitoring parameter C-44 (current coil diameter value) for confirmation.

FF.07	Roll diameter calculation filter time	Predetermined area:0.00~10.00s	Factory default: 0.50s
FF.08	The minimum linear velocity	Predetermined area:0.1~3200.0m/min	Factory default:200.0m/min

Roll diameter calculation filter time: The K value calculation filter time is the K value calculation cycle time.

The minimum linear speed of the coil diameter calculation: When the linear velocity corresponding to the output frequency is lower than this value, the K value calculation is not performed.

FF.10	PID limit value	Predetermined area:0.00~320.00Hz	Factory default:10.00Hz
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PID limiting value: Limit the results of PID calculations to prevent large fluctuations caused by large results after PID calculations.

FF.11	Switching frequency 1	Setting range: 0.00~maximum frequency	Factory default:5.00Hz
FF.12	Switching frequency 2	Setting range: 0.00~maximum frequency	Factory default:20.00Hz

When [Fb.17]=3 is switched according to the operating frequency, if the output frequency is lower than [FF.11], the PID parameter selects parameter group 1 ([Fb.11] ~ [Fb.13]); if the output frequency is greater than [FF.12], PID parameter selection parameter group 2 ([Fb.14] ~ [Fb.16]); if the output frequency is between [Fb.11] and [Fb.12], the PID parameters are two groups of PID Parameter linear interpolation value.

FF.13	Overshoot suppression function	Predetermined area:0~1	Factory default: 0
FF.14	Overshoot suppression cut-off speed	Predetermined area:0.1~3200.0m/min	Factory default:200.0m/min
FF.15	Upper limit overshoot suppression rate	Predetermined area:0.1~300.0%	Factory default:120.0%
FF.16	Lower limit overshoot suppression rate	Predetermined area:0.1~300.0%	Factory default:50.0%

Overshoot suppression function

0: invalid

1: Effective

Overshoot suppression cut-off speed: Set the effective range of overshoot suppression. When the current linear velocity [C-43] exceeds this value, the overshoot suppression function will stop.

Upper limit overshoot suppression rate: This parameter is used to suppress the PID adjustment whose feedback value is above the center point.

Lower limit overshoot suppression rate: This parameter is used to suppress the PID adjustment whose feedback value is below the center point.

FF.18	Synchronous speed gain	Predetermined area:-100.00% ~ +100.00%	Factory default:0.00%
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Synchronous speed gain: Calculate K value + synchronous speed gain = reset K value.

FF.19	Disconnection detection method	Predetermined area: 0~2	Factory default:1
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Disconnection detection method

0: invalid

1: Through PID feedback signal detection, frequency converter can judge whether the line is broken by detecting the feedback value of swing rod.

2: Through the proximity switch signal detection, the frequency converter judges whether the line is broken by detecting the signal of the proximity switch of the lower limit of the swing rod.

FF.20	Lower limit of PID disconnection detection	Setting range: 0.0~20.0%	Factory value: 10.0%
FF.21	Upper limit value of PID disconnection detection	Setting range: 80.0~100.0%	Factory value: 90.0%

Lower limit value of disconnection alarm: Set the lower limit of wire drawing machine PID wire breaking detection, and the feedback signal is less than the lower limit value of wire breaking alarm and continues [FF. 24] wire breaking detection judgment delay, it is considered that the wire drawing machine is broken.

Upper limit value of disconnection alarm: Set the upper limit of PID wire breaking detection of wire drawing machine. If the feedback signal exceeds the upper limit of wire breaking alarm and continues [FF. 24] wire breaking detection and judgment delay, the wire drawing machine is considered to be broken.

FF.22	Start up delay of disconnection detection	Setting range: 0.0~20.0s	Factory value: 5.0s
FF.23	Minimum frequency of broken wire detection	Setting range: 0.00~20.00Hz	Factory value: 10.00Hz
FF.24	Detection and judgment delay of disconnection	Setting range: 0.0~10.0s	Factory value: 2.0s
FF.25	Action mode of disconnection fault	Setting range: 0~1	Factory value: 1
FF.26	Line break reset selection	Setting range: 0~1	Factory value: 1
FF.27	Automatic reset time of disconnection fault	Setting range: 0.1~30.0s	Factory value: 5.0s

Starting delay of disconnection detection: In order to avoid false alarm during operation, the alarm delay time of line break feedback can be set.

Minimum frequency of broken wire detection: [FF. 23] can be set to 10.00 Hz to avoid false alarm during startup and shutdown. When the running frequency of the winder is less than the set value of [FF. 23], the winder will not be detected for wire breakage.

Detection and judgment delay of disconnection: In order to avoid false alarm of line break, when the system detects the line break, it will report the line break fault after judging the delay time after the disconnection detection.

Action mode of disconnection fault

0: free stop and alarm When the inverter detects the disconnection, the output is blocked immediately and the motor stops freely. And E. PID

fault is reported.

- 1: only disconnect fault terminal action When the frequency converter detects a disconnect, it continues to run. At the same time, if the multi-function output terminal is set to the disconnected output, the effective signal will be output immediately.

Choice of reset for disconnected faults

0: Manual When the function is effective, the frequency converter will be reset through the multi-function terminal.

1: Automatic The inverter automatically resets through the time interval set by [FF.27].

Automatic reset time of disconnection fault: When the inverter reports a disconnection fault, the disconnection fault will be automatically reset after the interval [FF.27] set time.

FF.28	Braking frequency	Predetermined area: 0.00~50.00Hz	Factory default: 1.50Hz
FF.29	Braking time	Predetermined area: 0.1~30.0s	Factory default: 5.0s

Braking frequency: When the main engine of the water tank is stopped, when the output frequency of the main inverter of the water tank is lower than [FF.28], the water tank slave running command (output from the selected output terminal) becomes invalid.

Braking time: When the water tank slave machine stops, the brake signal (output from the selected output terminal) is output, and after the time set by [FF.29], the output will stop immediately. During the output of the brake signal, if the running command is valid, the brake will be stopped immediately.

Note: When the inverter has a fault, it will always brake, the fault will be eliminated, and the brake will stop; only the water tank type wire drawing machine has the above two parameter functions.

FF.30	Meter counting method	Predetermined area: 0~2	Factory default: 0
FF.31	Reserved		
FF.32	Meter arrival control	Predetermined area: 0~1	Factory default: 0
FF.33	PUL Step length	Predetermined area: 0~32000mm	Factory default: 150mm

The meter counting function is only valid when it is the main unit of the water tank.

Meter counting method

0: Meter counting method

1: Count meters according to the output linear velocity Multiply the line speed by the running time to obtain the number of drawing meters.

2: Meter meter through PUL terminal Use external pulse input to count the number of wire drawing meters.

Meter arrival control

0: Continue to run, only the meter output terminal will act When the meter count reaches [FF.32] after setting the number of meters, The motor continues to run, and at the same time, if the multi-function output terminal is set to the meter arrival, it will immediately output an effective signal, output after the meter arrives, and stop output after resetting.

1: Decelerate to stop When the meter count reaches [FF.32] After setting the number of meters, the motor decelerates and stops.

PUL Step length: PUL When pulse input is used as meter input, each pulse represents the meter length. The actual meter count is equal to the number of pulses multiplied by the PUL meter step.

FF.34	Roll diameter reset selection	Predetermined area: 0~1	Factory default: 0
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Roll diameter reset selection

0: Manual When this function is valid, the inverter will reset the coil diameter through the multi-function input terminal, and it is only valid when it stops.

1: Automatic When this function is valid, the coil diameter will automatically reset when the inverter stops.

FF.35	Straight-forward slave machine calculates K value	Predetermined area: 0~300.00	Factory default: 100.00
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Calculate the K value from the straight-forward slave machine: Calculate K value + synchronous speed gain = reset K value Note: The calculation K value program of the water tank slave (winder) will automatically calculate the calculated K value of the straight-forward slave machine directly through [FF.35]. After setting the parameters of the motor, this parameter is related to the mechanical transmission ratio and the mold reduction ratio.

FF.39	Set weight	Predetermined area:0.1~3200.0kg	Factory default: 50.0kg
FF.40	Weight reach control	Predetermined area:0~1	Factory default: 0
FF.41	Wire diameter	Predetermined area:0.010~6.000mm	Factory default: 0.200mm
FF.42	Material density	Predetermined area:0.00~30.00g/cm <sup>3</sup>	Factory default: 7.87

Set weight: The set weight value. When the drawing weight value reaches [FF.39] Set value, At the corresponding output terminal(The output terminal is selected by [F2.45~F2.47])Output output valid signal.

Weight reach control

0: Keep running Continue to run, only when the weight reaches the output terminal. When the weight reaches [FF.39] the set weight, the motor continues to run, and if the multi-function output terminal is set to weight reached, it will immediately output a valid signal, output after the weight reaches, and stop output after reset.

1: Decelerate to stop When the weight reaches the [FF.32] set weight, the motor decelerates to stop.

Wire diameter:

Material density:

FF.44	Smooth start function	Predetermined area: 0~1	Factory default: 1
FF.45	Smoothing coefficient upper limit	Predetermined area: 0.0%~300.0%	Factory default:150.0%
FF.46	Smoothing coefficient lower limit	Predetermined area: 0.0%~300.0%	Factory default: 50.0%
FF.47	Reserved		
FF.48	K value limit during smooth start	Predetermined area: 0.00%~50.00%	Factory default: 5.00%
FF.49	Smooth start and exit time	Predetermined area: 0.00s~600.00s	Factory default: 4.00s
FF.50	Smooth start proportional gain	Predetermined area: 0.000~8.000	Factory default: 1.000
FF.51	Smooth start integration time	Predetermined area: 0.0~600.0s	Factory default: 0.0s
FF.52	Smooth start differential gain	Predetermined area: 0.000~6.000s	Factory default: 0.000s
FF.53	Smooth start roll diameter calculation filter time	Predetermined area: 0.00~10.00s	Factory default: 0.50s

Smooth start function:

0: OFF

1: ON

Smoothing coefficient upper limit: When PID feedback is greater than PID setting, it acts on PID output.

Lower limit of smoothing coefficient: When PID feedback is less than PID setting, it acts on PID output.

K value limit when smooth start: When smoothing starts, the limit range is based on the real-time K value.

Smooth start and exit time: After smoothing starts, the time required for the smoothing coefficient to change from 0% to 100%.

Smooth start proportional gain: Determine the adjustment intensity of the entire PID regulator during the smooth start phase.

Smooth start integration time: Determines the intensity of the integral adjustment of the PID regulator during the smooth start phase.

Smooth start differential gain: Determine the strength of the PID regulator to adjust the deviation or the rate of change of the feedback signal during the smooth start phase.

Smooth start roll diameter calculation filter time: The K value calculation filter time in the smooth start phase is the K value calculation cycle time.

### 4.3 Monitoring code

Press the PRG key for more than 2 seconds to enter the "C" parameter group. Check the current status of the inverter.

Function code	Function code name	Unit	Communication address	Function code	Function code name	Unit	Communication address
C-00	Given frequency	0.01Hz	0x2100	C-25	Inverter power rating	kW	0x2119
C-01	Output frequency	0.01Hz	0x2101	C-26	Inverter rated voltage	V	0x211A
C-02	Output current	0.1A	0x2102	C-27	Inverter rated current	A	0x211B
C-03	Input voltage	0.1V	0x2103	C-28	Software version		0x211C
C-04	Output voltage	0.1V	0x2104	C-29	PG feedback frequency	0.01Hz	0x211D
C-05	Mechanical speed	1RPM	0x2105	C-30	Extension terminal input status	See input and output terminal state diagram	0x211E
C-06	Given torque	0.1%	0x2106	C-31	Extension terminal output status		0x211F
C-07	Output torque	0.1%	0x2107	C-32	Reserved		0x2120
C-08	PID given value	0.1%	0x2108	C-33	Reserved		0x2121
C-09	PID feedback	0.1%	0x2109	C-34	Reserved		0x2122
C-10	Output power	0.1%	0x210A	C-35	Timer time	Second/minute/hour	0x2123
C-11	Bus voltage	0.1V	0x210B	C-36	Fault warning code		0x2124
C-12	Module temperature 1	0.1°C	0x210C	C-37	Accumulated power consumption (low level)	1°	0x2125
C-13	Module temperature 2	0.1°C	0x210D	C-38	Accumulated power consumption (high)	10 thousand°	0x2126
C-14	Input terminal X connected state	See input and output terminal state diagram	0x210E	C-39	Power factor angle	1°	0x2127
C-15	Output terminal Y connected state		0x210F	C-40	Feedforward frequency	0.01HZ	0x2128
C-16	Analog VS input value	0.001V	0x2110	C-41	Calculate the value of K	0~300.00	0x2129
C-17	Analog AI input value	0.001V/0.001mA	0x2111	C-42	Real time K value	0~300.00	0x212A
C-18	Analog AS input value	0.001mA	0x2112	C-43	When the front line speed	0.1m/min	0x212B
C-19	Pulse signal PUL input value	0.001kHz	0x2113	C-44	Current roll diameter	1mm	0x212C
C-20	Analog output	0.01V	0x2114	C-45	PID adjustment amount	0.01HZ	0x212D
C-21	Analog output AO2	0.01V/0.01mA/0.01kHz	0x2115	C-46	Current meter count (100m)	100m	0x212E

C-22	Counter count value		0x2116	C-47	Meter count value in 100.00 meters	1cm	0x212F
C-23	Running time of this power-on	0.1 hour	0x2117	C-48	Current weight	0.1kg	0x2130
C-24	Accumulated running time of this machine	hour	0x2118				

## 5.0 Parameter setting reference

### 5.1 Recommended parameters of straight wire drawing machine

Function code	Function code name	Set	Function
F0.00	control mode	0	V/F control
F0.02	Run command channel	1	Terminal control
F0.03	Frequency given source channel A	10	Dedicated channel for wire drawing
F0.04	Frequency given source channel B	6	Communication setting (feedforward frequency)
F0.09	Max frequency	60.00	
F0.11	Digital setting of upper limit frequency	60.00	
F0.14	Acceleration time 1	2.00	
F0.15	Deceleration time 1	2.00	
F1.10	Stop mode	1	Free stop
F2.01 (X2)	Multi-function input terminal 2(X2)	2	Reverse operation
F2.02 (X3)	Multi-function input terminal 3(X3)	4	Forward jog
F2.03 (X4)	Multi-function input terminal 4(X4)	80	(Reset roll diameter)
F2.04 (X5)	Multi-function input terminal 5(X5)	82	(Disconnection fault input)
F2.05 (X6)	Multi-function input terminal 6(X6)	84	(Straight-in host)
F2.08	X1~X4 Terminal feature selection	0000	
F2.29	Output terminal (Y)	1	The inverter is running
F2.30	Relay output terminal (TA1-TB1-TC1)	4	Fault trip alarm 1 (alarm during fault self-recovery)
F2.31	Relay output terminal (TA2-TB2-TC2)	82	Disconnection output
Fb.03	PID Controller feedback signal source	2	Voltage analog VS feedback
Fb.11	Proportional gain P1	1.50	1.200
Fb.12	Integration time I1	2.00	3.0
Fb.13	Derivative time D1	0.15	0.0
Fb.14	Proportional gain P2	1.50	1.000
Fb.15	Integration time I2	2.00	3.0
Fb.16	Derivative time D2	0.15	0.0
FF.02	Maximum line speed of host	1200.0	
FF.04	Mechanical transmission ratio	2.02	

FF.05	Reel diameter 1	560	
FF.08	Calculating the minimum linear speed of the coil diameter	60.0	
FF.10	PID limit value	5.00	
FF.18	Synchronous speed gain	0	

**5.2 Recommended parameters of water tank type dual frequency conversion host (wire drawing machine)**

Function code	Function code name	Settings	Features
F0.00	control mode	0	V/F control
F0.02	Run command channel	1	Terminal control
F0.03	Frequency given source channel A	0	Keyboard number given frequency
F0.09	Maximum frequency	50.00	
F0.11	Digital setting of upper limit frequency	50.00	
F0.14	Acceleration time 1	30.00	
F0.15	Deceleration time 1	30.00	
F2.01 (X2)	Multi function input terminal 2(X2)	3	Three wire operation control (X1)
F2.03 (X4)	Multi function input terminal 4(X4)	6	Free parking
F2.04 (X5)	Multi function input terminal 5(X5)	8	Fault reset
F2.05 (X6)	Multi function input terminal 6(X6)	83	Meter reset
F2.08	X1~X4 Selection of terminal	1000	X4 terminal disconnection effective
F2.26	Terminal control operation mode	2	Three wire system 1
F2.29	Output terminal (Y)	35	Water tank slave operation command
F2.30	Relay output terminal (TA1-TB1-TC1)	4	Fault trip alarm 1 (alarm during fault self recovery)
F2.31	Relay output terminal (TA2-TB2-TC2)	34	Meter arrival
F3.54	AO1 Output selection	1	Output frequency

**5.3 Recommended parameters of water tank type double frequency conversion take-up machine**

Function code	Function code name	Settings	Features
F0.00	control mode	0	V/F control
F0.02	Run command channel	1	Terminal control
F0.03	Frequency given source channel A	10	Special channel for wire drawing machine
F0.04	Frequency given source channel B	6	Communication setting (feedforward frequency)
F0.09	Maximum frequency	80.00	
F0.11	Digital setting of upper limit frequency	80.00	
F0.14	Acceleration time 1	1.00	
F0.15	Deceleration time 1	1.00	

F1.10	Stop mode	1	Free stop
F2.01 (X2)	Multi-function input terminal 2 (X2)	6	Free stop
F2.02 (X3)	Multi-function input terminal 3 (X3)	8	Fault reset
F2.03 (X4)	Multi-function input terminal 4 (X4)	80	Roll diameter reset
F2.04 (X5)	Multi-function input terminal 5 (X5)	81	Roll diameter switch
F2.05 (X6)	Multifunctional input terminal 6 (X6)	82	Disconnection fault input
F2.08	X1~X4 Terminal feature selection	0010	
F2.45	Output terminal (Y)	82	Disconnection output
F2.46	Relay output terminal (TA1-TB1-TC1)	4	Fault trip alarm 1 (alarm during fault self-recovery)
F2.47	Relay output terminal (TA2-TB2-TC2)	33	Brake output
Fb.03	PID Controller feedback signal source	2	Voltage analog VS feedback

Note: The above recommended parameter values may not be suitable for some special working conditions, and should be adjusted according to site conditions during use.

## 6.0 Debugging of special inverter for wire drawing machine

### 6.1 Wiring of host and take-up machine

The output frequency of the host frequency converter is connected by the programmable analog output port A01 and GND terminal with the current input ports as and GND of the take-up inverter. As the feedforward frequency of the take-up machine, the output frequency of the host frequency converter works together with the PID adjustment value calculated inside the winding machine to ensure the constant tension of the winding and paying off.

### 6.2 Take up machine feedback connection

The three ends of tension balance bar potentiometer are connected with + 10V, AI and GND of take-up frequency converter. According to the highest position feedback voltage and the lowest position feedback voltage of swing rod, set [f3.06] and [f3.08] respectively, which can ensure that the PID feedback value is 50% when the swing rod is in the middle position. The tension feedback potentiometer shall be 360 ° high precision.

### 6.3 Braking resistor wiring

In order to ensure the constant tension of take-up and pay off, the frequency converter of winding machine needs to accelerate and decelerate in a short period of time. When decelerating at high speed, the DC bus voltage of the frequency converter will increase. In order to ensure the normal operation of the frequency converter, it is necessary to connect an external braking resistor. For the resistance value and power of the braking resistance, please refer to the operation manual of AC200 series frequency converter. The braking resistor is connected with the (+ +) and Pb of the special frequency converter of ac200-I series wire drawing machine.

### 6.4 Disconnection detection function

When the tension feedback value is less than the lower limit value of PID disconnection detection [FF. 20] or exceeds the upper limit value of PID disconnection detection [FF. 21] and lasts for the time set by [FF. 24], the frequency converter will make corresponding processing in the way selected by [FF. 25].

Lower limit value of wire breaking alarm [FF. 20]: set the lower limit of wire drawing machine PID wire breaking detection. If the feedback signal is less than the lower limit of wire breaking alarm and continues [FF. 24] wire breaking detection and judgment delay, the wire drawing machine is considered to be broken.

Disconnection detection and judgment delay [FF. 24]: in order to avoid false alarm of disconnection, when the system detects the disconnection, the system will report the disconnection fault after judging the delay time through the disconnection detection. Action mode of broken wire fault: 0. Stop the machine freely and give an alarm; 1. Only the broken wire fault terminal acts. When the frequency converter detects

the disconnection, it will continue to run. At the same time, if the multi-function output terminal is set as broken line output, it will output effective signal immediately.

In order to avoid false alarm in the process of starting or stopping, it can be set that the starting and running time of the frequency converter exceeds the set time of [FF. 22] and the output frequency of the frequency converter is higher than the setting frequency of [FF. 23], the function of line break detection can be started.

## **6.5 Brake control**

When the slave machine stops, it outputs the brake signal (output by the selected output terminal), and stops the output immediately after the time set by [FF. 29]. During the brake signal output, if the operation command is valid, stop the brake immediately.