

Preface

Thank you for using high performance general vector control inverter manufactured by Shenzhen EasyDrive Electric Co., Ltd.

This series inverter is a general-purpose frequency converter based on flux vector algorithm control. It has a series of practical functions such as motor parameter self-identification, big torque at low frequency , wobble frequency control, droop control, simple PLC, fixed length control and flexible frequency set mode, and can achieve a variety of frequency combinations setting and RS485 communication.

Before using the inverter, the inverter user and the relevant technicians shall read the User Manual carefully to ensure the correct installation and operation of the inverter and its optimal performance.

The User Manual is subject to change without prior notice. The new edition shall prevail.

High performance general vector frequency inverter User Manual

Edition Code: V1.0



Danger

The frequency converter must be earthed reliably, If not, there is a potential risk of personal injury in the unit.

Intended Readers

The User Manual is intended for the following people to read:

Inverter installation personnel, engineers and technicians (electrical engineers and electrical operators), and designers, etc.

Please ensure the User Manual is to be received by end user.

Conventions

Sign Convention



Note The operation not in accordance with requirements may cause moderate injury or minor injury.



Danger The operation not in accordance with requirements may cause death or serious injury.

Chapter 1 Product specification and order notification

1.1 Inverter series model

The inverter has two voltage class 220V and 380V(The input voltage range of 220V: 180V-220VAC ; The input voltage range of 380V: 380V-440V.) The applicable motor power range is 380V:0.75KW~280KW;220V:0.75-2.2KW. GT200 series inverter model is shown as table1-1 and 1-2.


Table 1-1 Inverter Model 380V

Model (G:Constant torque; P:Fan/pump)	Rated Capacity (kVA)	Rated output current (A)	Matching motor (kW)
GT200-4T0007G/-	0.8	2.5	0.75
GT200-4T0015G/-	1.6	4.1	1.5
GT200-4T0022G/-	2.4	5.5	2.2
GT200-4T0040G/4T0055P	4.1/8.5	9.6/13	3.7/5.5
GT200-4T0055G/4T0075P	8.5/11	13/17	5.5/7.5
GT200-4T0075G/4T0110P	11/17	17/25	7.5/11
GT200-4T0110G/4T0150P	17/21	25/32	11/15
GT200-4T0150G/4T0185P	21/24	32/37	15/18.5
GT200-4T0185G/4T0220P	24/30	37/45	18.5/22
GT200-4T0220G/4T0300P	30/40	45/60	22/30
GT200-4T0300G/4T0370P	40/50	60/75	30/37
GT200-4T0370G/4T0450P	50/60	75/90	37/45
GT200-4T0450G/4T0550P	60/72	90/110	45/55
GT200-4T0550G/4T0750P	72/100	110/157	55/75
GT200-4T0750G/4T0900P	100/116	157/180	75/90
GT200-4T0900G/4T1100P	116/138	180/214	90/110
GT200-4T1100G/4T1320P	138/167	214/256	110/132
GT200-4T1320G/4T1600P	167/200	256/307	132/160
GT200-4T1600G/4T1850P	200/230	307/340	160/185

GT200-4T1850G/4T2000P	230/250	340/385	185/200
GT200-4T2000G/4T2200P	250/280	385/430	200/220
GT200-4T2200G/4T2500P	280/317	430/465	220/250
GT200-4T2500G/4T2800P	317/355	465/525	250/280
GT200-4T2800G/4T3150P	355/388	525/590	280/315

Table 1-2 220V Inverter model

Model (G:Constant torque)		Rated Capacity (kVA)	Rated output current (A)	Matching motor (kW)
220V Single	GT200-2S0007G	0.8	5.0	0.75
	GT200-2S0015G	1.6	7.8	1.5
	GT200-2S0022G	2.4	10.8	2.2

 **Remind: If you need other power range inverter, please consult with the factory before ordering!**

1.2 Specifications

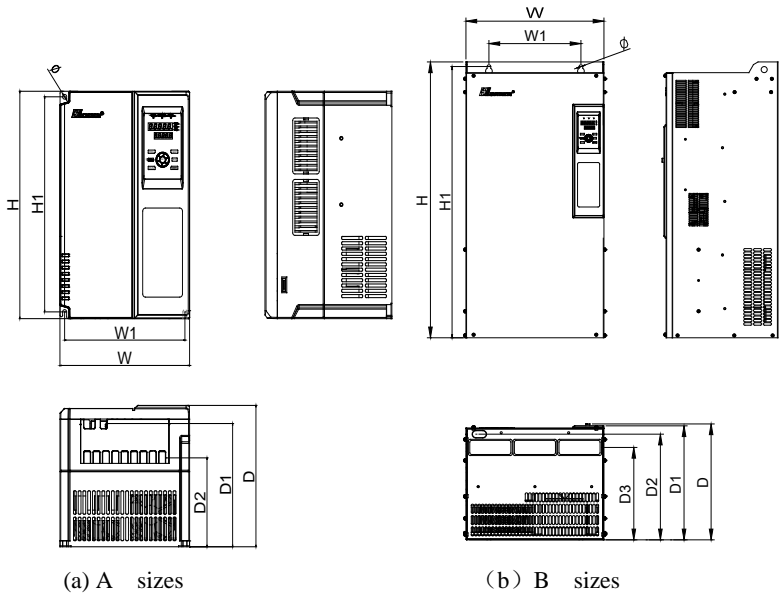
Table 1-3 Product technical specifications

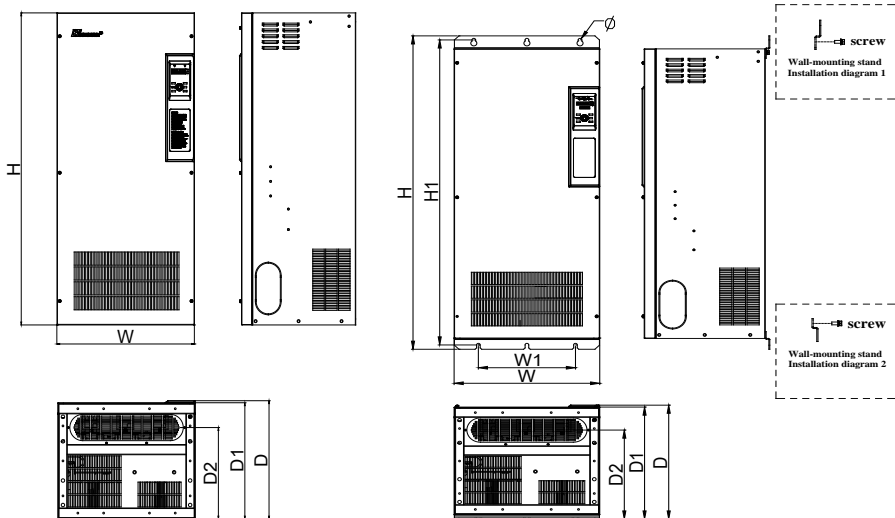
Item		Description
Input	Rated voltage/ Frequency	three-phase,380V-440Vac;50Hz/60Hz
	Allowed voltage range	Voltage:380v(-15%)~440v(+10%);Voltage unbalance rate: < 3%;Frequency:±5%
Output	Rated voltage (V)	380Vac~440Vac
	Frequency	0Hz~550Hz
	Overload capacity	G type:150% rated current for 60s ;P type:120% rated current for 60s
Main control function	Control mode	Open-loop vector mode, V/F mode
	Range of speed regulation	1: 100
	starting torque	150% rated torque when 0.5Hz
	Speed control accuracy	≤±0.5% rated synchronous speed
	Frequency accuracy	Digital set :max. frequency×±0.01% Analog set: max.frequency×±0.2%
	Frequency resolution	Digital set :0.01Hz ;Analog set: max. frequency×0.1%
	Torque rise	Auto torque ascension,manual torque ascension 0.1% ~ 30.0%
	V/F curve	Four ways:1 kind of user set V/F curve way、 3 kinds of drop torque characteristic curve way(2.0 times power, 1.7 times power, 1.2 times power
	Acceleration/deceler ation curve	Two ways:line acceleration/deceleration、 S curve acceleration/deceleration; four acceleration/deceleration time, with the unit of time (minute/second) optional ,max.time set 60 hours
	DC braking	DC braking start frequency:0.00Hz~60.00Hz;braking time:0.0~30.0s;braking current: 0.0~100.0%
	Jogging	Jog frequency range:0.10Hz~50.0Hz
	Multi-speed operating	It can be realized by interior-PLC or control terminal
	Built-in PID	Be convenient to make closed-loop control system

Item		Description
	Auto energy-saving running	According to load condition, V/F curve can be optimized automatically to get the aim of energy-saving running.
	Auto voltage adjustment	when the voltage of network changes, the output voltage can be automatically kept constant
	Auto current limiting	During the operation, the current is automatically limited to prevent frequent flow to fault trip
	Auto carrier adjustment	According to the load characteristics, automatically adjust the carrier frequency
Customized function	Textile swing frequency	Textile swing frequency control, it can realize the function of fixed and variable swing frequency
	Fixed length control	Length reached stop function
	Sagging function	Applicable to multiple inverters drive one load
	Instant stop/non-stop control	when power-supply off instantly, it can realize keep running through control bus voltage
	Binding function	Running command channel and frequency given channel can be binded and change at same time
Running function	Running command channel	Operation panel, control terminal and communication port, can be switched through many ways
	Frequency given channel	Digital given, analog voltage given, analog current given, pulse given, communication port given, can be switched through many ways
	Auxiliary frequency given channel	Realize flexible auxiliary frequency fine-tuning and frequency combination operation
	Pulse output terminal	0~50KHz pulse square wave signal output, can realize output setting frequency and output frequency ect.
	Analog output terminal	2 ways analog output, 0~10V, 0~20mA to get output of physical quantity such as setting frequency and output frequency
Operating panel	Double row LED display	It can display 20 kinds of parameters such as setting frequency, output frequency, output voltage, output current and so on
	Key Locked and function choose	Define the function scope of part of the keys, in case of mistake operation
protection function		Phase-loss protection(optional), over current protection, over voltage protection, under voltage protection, over heat protection, over load

Item		Description
Environment	Service location	Indoor,not suffer from sun,dust,corrosive gas,oil fog,steam and so on
	Altitude	Less than 1000m (derating at higher than 1000m)
	Environment temperature	$-10^{\circ}\text{C}\sim +40^{\circ}\text{C}$ (Derating use in $40^{\circ}\text{C}\sim 50^{\circ}\text{C}$)
	Humidity	Less than 90%RH, no condensation
	Vibration	Less than 5.9m/s ²
	Storage temperature	$-40^{\circ}\text{C}\sim +60^{\circ}\text{C}$
	Pollution degree	PD2
Structure	Protection class	IP20
	Cooling way	Froced air cooling
Installation Way		Wall-hanging,Cabinet, Trough-wall installation
Distribution System		TN、 TT
efficiency		$\geq 93\%$

1.3 Outline size





(c) C sizes


(d) Wall-mounting sizes

Form 1-4 Inverter Exterior and Mounting Dimensions b(Unit:mm)

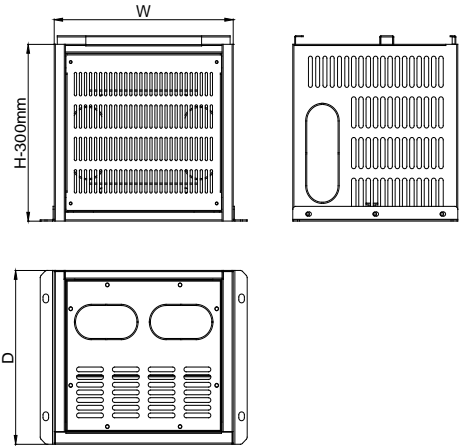
Model	W	W1	H	H1	D	D1	D2	D3	Mounting Holes(Φ)	Refer
GT200-4T0007G/ 2S0007G	120	109	215	204	158	133	85		5.5	(a)
GT200-4T0015G/ 2S0015G										
GT200-4T0022G/ 2S0022G										
GT200-4T0040G/ 4T0055P										
GT200-4T0055G/ 4T0075P	150	138	259	248	183	176	150	105	5.5	(a)
GT200-4T0075G/ 4T0110P										
GT200-4T0110G/ 4T0150P	205	188	322	305	219	210	168	143	6.5	(a)
GT200-4T0150G/ 4T0185P										

Model	W	W1	H	H1	D	D1	D2	D3	Mounting Holes(Φ)	Refer
GT200-4T0185G/ 4T0220P	235	218	370	350	237	230	200	145	7	(a)
GT200-4T0220G/ 4T0300P										
GT200-4T0300G/ 4T0370P	305	200	490	470	278	270	235	207	10	(b)
GT200-4T0370G/ 4T0450P										
GT200-4T0450G/ 4T0550P	320	197	560	535	308	302	275	237	10	(b)
GT200-4T0550G/ 4T0750P										
GT200-4T0750G/ 4T0900P										
GT200-4T0900G/ 4T1100P	355	240	678	659	320	307	257	257	11	(b)
GT200-4T1100G/ 4T1320P										
GT200-4T1320G/ 4T1600P										
GT200-4T1600G/ 4T1850P	450	300	900	875	378	372	345	300	12	(b)
GT200-4T1850G/ 4T2000P										
GT200-4T2000G/ 4T2200P	480	-	1070	-	412	400	313	-	-	(c)
GT200-4T2200G/ 4T2500P										
GT200-4T2500G/ 4T2800P	525	-	1300	-	438	425	335	-	-	(c)
GT200-4T2800G/ 4T3150P										

Model	W	W1	H	H1	D	D1	D2	D3	Mounting Holes(Φ)	Refer
GT200-4T2000G/ 4T2200P (Wall-mounting)	480	320	1158	1127	421	414	329	-	12	(d)
GT200-4T2200G/ 4T2500P (Wall-mounting)										
GT200-4T2500G/ 4T2800P (Wall-mounting)	525	400	1388	1357	447	440	350	-	12	(d)
GT200-4T2800G/ 4T3150P (Wall-mounting)										

-  **Note:** 1.Optional base for GT200-4T0300G/4T0370P~GT200-4T1850G/4T1600.
2.Need to match wall-mounted stand for wall-mounted design of
GT200-4T2200G/4T2500P~GT200-4T2800G/4T3150P.

1.4. Optional base dimension



Remark: The base W and D are the same with the corresponding inverter size,please refer to table 1-4, and H is fixed 300mm.

1.5 Keyboard Size

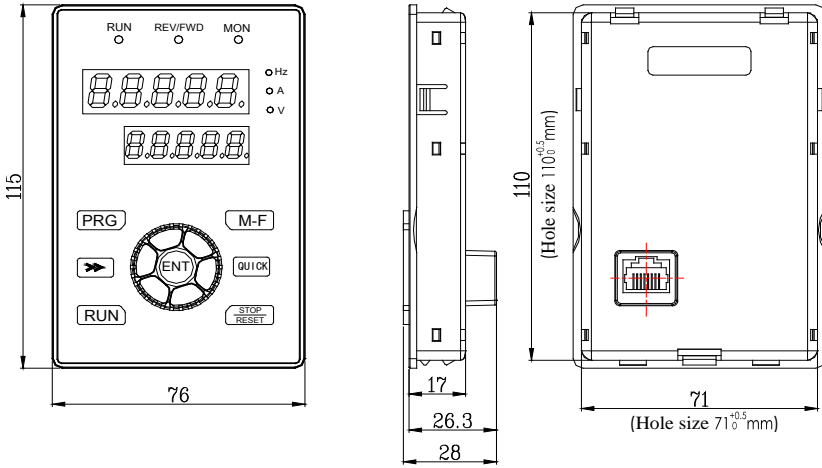


Diagram 1-1 Keyboard Size

1.6 Braking Resistor

Energy-consumption braking resistor is provided as shown in table 1-5,1-6 and the installation of braking resistor wire is provided as shown in 1-2.

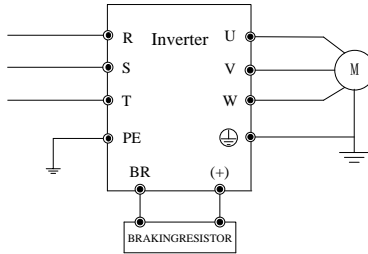


Diagram 1-2 Connection between inverter and braking unit

NOTE:

- (1)Braking resistor power derating coefficient had better not more than 30%, otherwise there is the risk of fire.
- (2)The device of 22kw and below 22kw are matched with built-in braking unit , the device of 30KW and above need to be connected with braking unit outside.
- (3)Wiring of braking resistor should be less than 5m;The braking resistor would have temperature rise due to feedback energy consumption during dynamic braking, please ensure the safety protection and good ventilation.

Braking resistance value and power are selected according to the actual situation, the greater of the system inertia, the shorter of the deceleration time, the more frequent braking,

then the greater of braking resistor power and smaller of resistance value. Table 1-5, 1-6 is recommended according to general applications (Breaking Utilization rate FC.01 is 10%)

Table 1-5 Select table of braking resistor (380V)

Model No.	Applicable motor Power (KW)	Resistor Resistance (Ω)	Resistor Power (W)
GT200-4T0007G/-	0.75	≥500	100
GT200-4T0015G/-	1.5	≥300	200
GT200-4T0022G/-	2.2	≥200	200
GT200-4T0040G/4T0055P	3.0	≥200	300
GT200-4T0055G/4T0075P	5.5	≥80	750
GT200-4T0075G/4T0110P	7.5	≥50	1100
GT200-4T0110G/4T0150P	11	≥50	1500
GT200-4T0150G/4T0185P	15	≥45	1800
GT200-4T0185G/4T0220P	18.5	≥45	2200
GT200-4T0220G/4T0300P	22	≥24	3000

Table 1-6 Select table of braking resistor (220V)

Model No.	Applicable motor Power (KW)	Resistor Resistance (Ω)	Resistor Power (W)
GT200-2S0007G	0.75	≥150	100
GT200-2S0015G	1.5	≥100	200
GT200-2S0022G	2.2	≥75	300

Chapter2 Installation and Wiring of Inverter

2.1 Installation environment of inverter

2.1.1 Installation environment condition

- (1) The inverter shall be installed indoors of perfect ventilation, and the environment temperature shall be in the range of $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$, in case that the temperature exceeds 40°C , the external air-blast cooling or derating shall be used.
- (2) Avoid being installed in location where suffers from the sun, dust, floatation fiber and metallic power
- (3) Never to be installed in location where corrosive and explosive gas has
- (4) The humidity shall be lower than 90%RH, no condensation
- (5) The inverter shall be installed in the location where the plane fixed vibration is less 5.9 m/s^2
- (6) The inverter had better be kept far away from the electronmagnetic interference device

2.1.2 Installation direction and space

- (1) Shall be installed vertically usually
- (2) The installation space and min distance are shown as diagram2-1
- (3) As shown in diagram 2-2, there shall be baffle mounted among them, when several inverters are installed vertically.

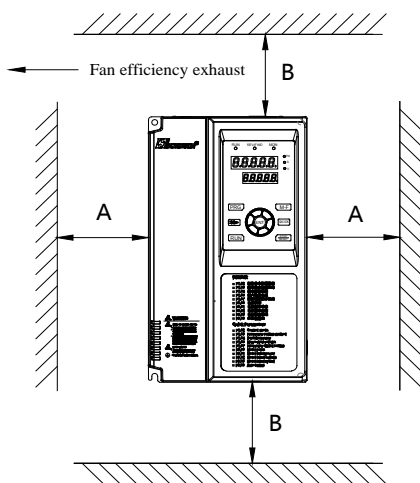


Diagram2-1 Installation space

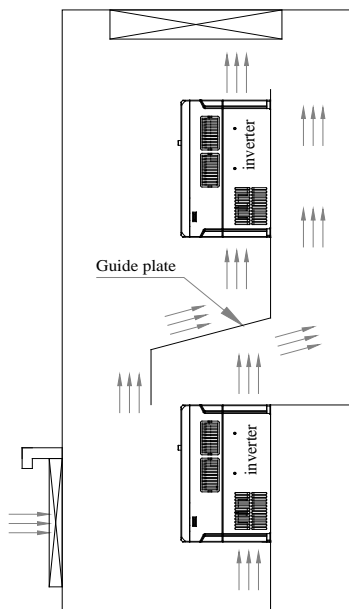


Diagram 2-2 Installation of multi inverters

Diagram2-1 Installation space condition

Inverter type	Installation space (mm)	
	A	B
GT200-4T0007G~GT200-4T0370G/4T0450P	≥50	≥100
GT200-4T0450G/4T0550P~GT200-4T2800G/4T3150P	≥50	≥200

2.1.3 Inverter Installation Method and Steps

GT200 series according to different power levels, there are two kinds of plastic and sheet metal structure; Depending on the different installation application, GT210 series has two installation methods of wall-mounted and embedded

1、Plastic structure wall- mounted installation

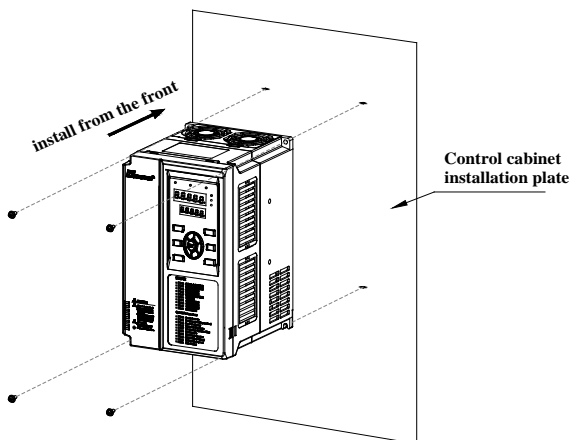


Diagram2-3 Plastic structure wall-mounted installation

2、Plastic structure embedded mounting.

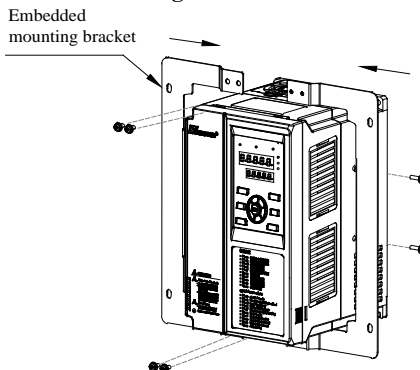


Diagram2-4 Plastic structure embedded mounting bracket installation

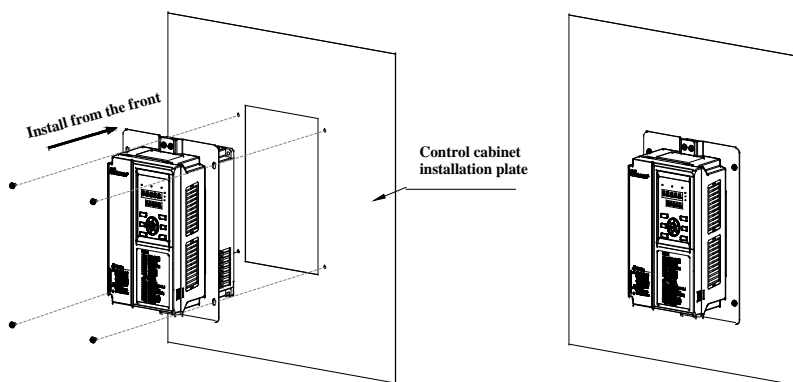


Diagram2-5 Plastic structure embedded mounting

3、Sheet metal structure wall-mounted installation

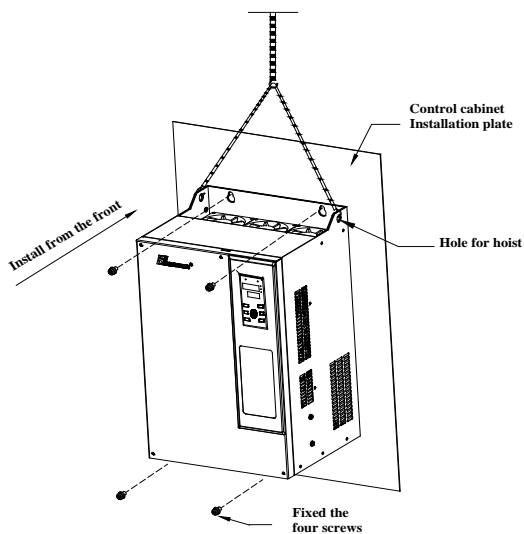


Diagram2-6 Sheet metal structure wall-mounted installation

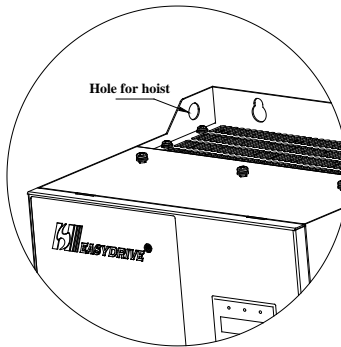


Diagram2-7 Hoisting diagram of sheet metal structure

4、Sheet metal structure embedded mounting

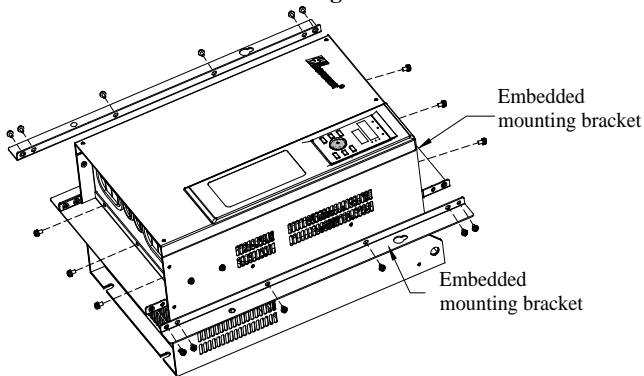


Diagram2-8 Sheet metal structure install schematic external bracket diagram

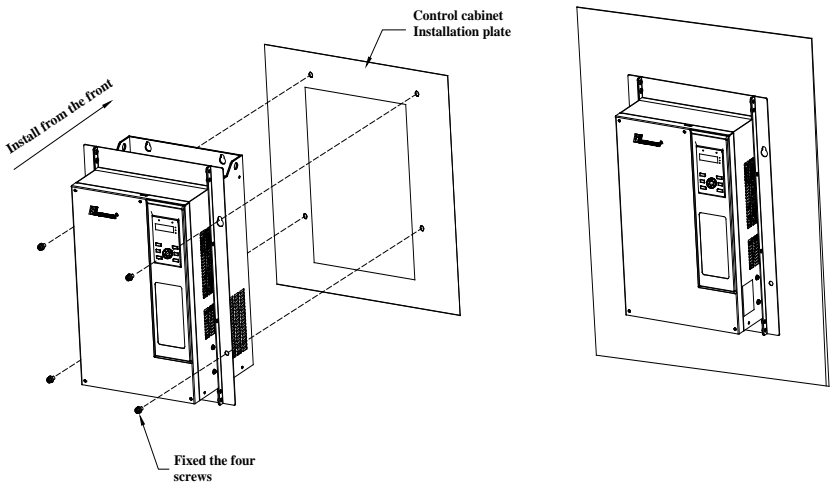


Diagram2-9 Sheet metal structure embedded mounting diagram

2.2 Disassembling and installation of inverter panel

2.2.1 Cover plate disassembly and installation of plastic enclosure inverter

◆ Disassemble Cover Plate

Shown as diagram2-10,push out the hooks on the left and right sides of the cover from inside at 1 direction with tools, then lift the panel from direction 2

◆ Install Cover Plate

Shown as diagram2-11,Align the groove above the cover with card buckle on the enclosure,press down the cover plate from direction 1 , until we hear a "click" sound

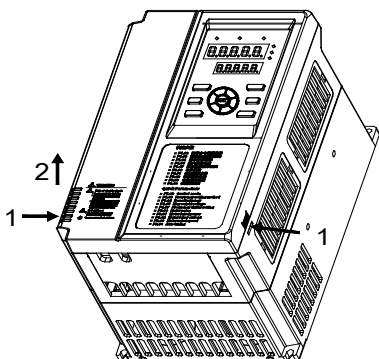


Diagram2-10 Disassembly of cover

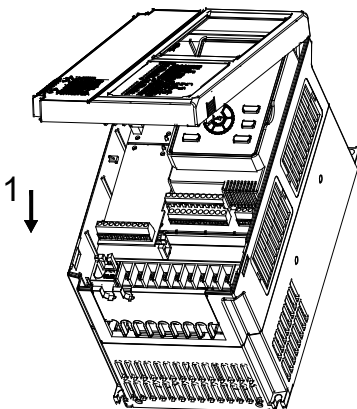


Diagram2-11 Installation of cover

2.2.2 Cover plate disassembly and installation of Sheet metal inverter enclosure

◆ Disassemble Cover Plate

Shown as diagram2-12,Disassemble mounting screw at Cover plate 1 ,then lift the panel from 2 direction

◆ Install Cover Plate

Shown as diagram 2-13,Card buckle on cover embedded groove of the inverter enclosure, according to the direction 1 install cover plate,then tighten the screws at the cover 2.

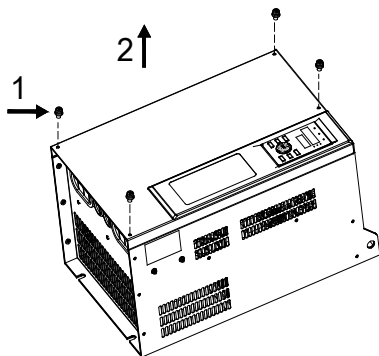


Diagram2-12 Disassembly of cover

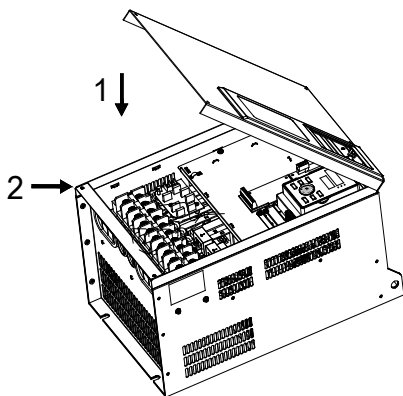


Diagram2-13 Installation of cover

2.2.3 .Operation panel disassembly and installation

◆ Disassemble Cover Plate

Pls refer to the diagram 2-10 to 2-13

◆ Disassemble operation panel

According to the diagram2-14,Press down on the groove 1 on both sides of the operation panel with your fingers,and then take out the operation panel body along the direction 2

◆ Install Operation Panel

Shown as the diagram 2-15,Press down operation panel from direction 1,until hear a “click” sound. Never to install operation panel from any other direction,otherwise will lead to poor contact of operation panel

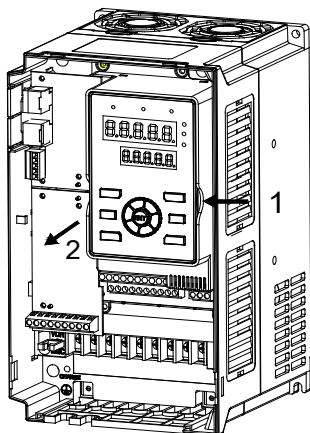


Diagram2-14 Operation panel disassembly

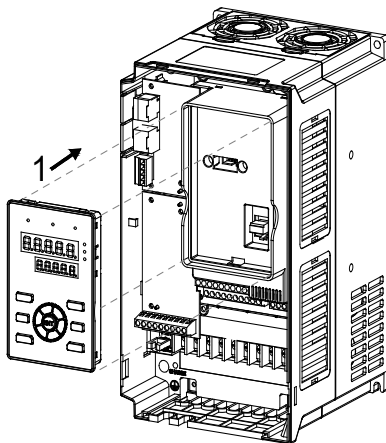


Diagram2-15 Operation panel installation

2.3 Wiring OF Main Circuit Terminal

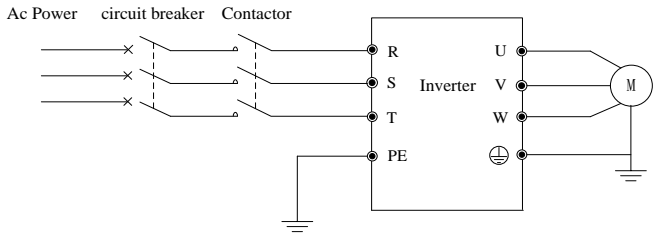


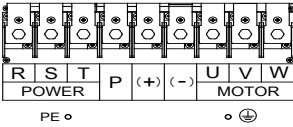

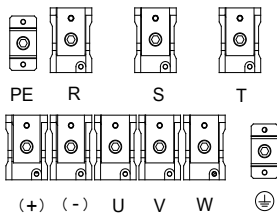

Diagram2-16 Main circuit basic wiring

2.3.1 The wiring of main circuit terminal

(1) Input/output terminal of main circuit shown as table 2-2

Application model	Terminal of main circuit	Terminal name	Function description
GT200-2S0007G GT200-2S0015G GT200-2S0022G		L、N	Single AC 220V input terminal
		U、V、W	3-phase Ac output
		(+)、BR	Braking resistor connection
			Motor grounding
		(+)、(-)	Dc positive and negative bus output,external braking unit
GT200-4T0007G/- GT200-4T0015G/- GT200-4T0022G/- GT200-4T0040G/ 4T0055P GT200-4T0055G/ 4T0075P GT200-4T0075G/ 4T0110P GT200-4T0110G/ 4T0150P GT200-4T0150G/ 4T0185P		R、S、T	3-phase Ac 380v input
		U、V、W	3-phase Ac output
		(+)、BR	Braking resistor connection
			Motor grounding
		(+)、(-)	Dc positive and negative bus output,external braking unit
		PE	Protect grounding

Application model	Terminal of main circuit	Terminal name	Function description
GT200-4T0185G/ 4T0220P GT200-4T0220G/ 4T0300P		R、S、T	3-phase Ac 380v input
		U、V、W	3-phase Ac output
		(+)、BR	Braking resistor connection
		(+)、(-)	Dc positive and negative bus output,external braking unit
			Motor grounding
		PE	Protect grounding
GT200-4T0300G/ 4T0370P GT200-4T0370G/ 4T0450P		R、S、T	3-phase Ac 380v input
		U、V、W	3-phase Ac output
		P、(+)	External connect DC reactor
		(+)、(-)	Dc positive and negative bus output,external braking unit
			Motor Grounding
		PE	Protect Grounding
GT200-4T0450G/ 4T0550P GT200-4T0550G/ 4T0750P		R、S、T	3-phase Ac 380v input
		U、V、W	3-phase Ac 380v input
		P、(+)	External connect DC reactor
		(+)、(-)	Dc positive and negative bus output,external braking unit
			Motor Grounding
		PE	Protect Grounding

Application model	Terminal of main circuit	Terminal name	Function description
GT200-4T0750G/ 4T0900P GT200-4T0900G/ 4T1100P GT200-4T1100G/ 4T1320P GT200-4T1320G/ 4T1600P GT200-4T1600G/ 4T1850P GT200-4T1850G/ 4T2000P		R、S、T	3-phase Ac 380v input
		U、V、W	3-phase Ac 380v input
		P、(+)	External connect DC reactor
		(+), (-)	Dc positive and negative bus output,external braking
			Motor grounding
		PE	Protect grounding
GT200-4T2000G/ 4T2200P GT200-4T2200G/ 4T2500P GT200-4T2500G/ 4T2800P GT200-4T2800G/ 4T3150P		R、S、T	3-phase Ac 380v input
		U、V、W	3-phase Ac 380v input
		(+), (-)	Dc positive and negative bus
			Motor grounding
		PE	Protect grounding

(2)Table2-3 The selection of main circuit cable diameter, protection circuit breaker QF or fuse as following

Model	Circuit breaker (A)	Fuse (A)	Input/output wire (mm ²)	Control wire (mm ²)
GT200-4T0007G	10	10	1.5	1
GT200-2S0007G	10	10	1.5	1
GT200-4T0015G	10	10	1.5	1
GT200-2S0015G	20	16	1.5	1
GT200-4T0022G	16	10	2.5	1
GT200-2S0022G	32	20	2.5	1
GT200-4T0040G	20	16	2.5	1
GT200-4T0055G/4T0075P	25/40	25/32	4/6	1.0
GT200-4T0075G/4T0110P	40/63	32/38	6/10	1.0
GT200-4T0110G/4T0150P	63/63	38/40	10/10	1.0
GT200-4T0150G/4T0185P	63/100	40/50	10/16	1.0
GT200-4T0185G/4T0220P	100/100	50/65	16/16	1.0
GT200-4T0220G/4T0300P	100/125	65/80	16/25	1.0
GT200-4T0300G/4T0370P	125/160	80/95	25/25	1.0
GT200-4T0370G/4T0450P	160/200	95/115	25/35	1.0
GT200-4T0450G/4T0550P	200/200	115/170	35/35	1.0
GT200-4T0550G/4T0750	200/250	170/205	35/70	1.0
GT200-4T0750G/4T0900P	250/315	205/245	70/70	1.0
GT200-4T0900G/4T1100P	315/400	245/300	70/95	1.0
GT200-4T1100G/4T1320P	400/400	300/300	95/150	1.0
GT200-4T1320G/4T1600P	400/630	300/410	150/185	1.0
GT200-4T1600G/4T1850P	630/630	410/475	185/240	1.0
GT200-4T1850G/4T2000P	630/630	410/475	185/240	1.0
GT200-4T2000G/4T2200P	630/800	475/475	240/150×2	1.0
GT200-4T2200G/4T2500P	800/800	475/620	150×2/150×2	1.0
GT200-4T2500G/4T2800P	800/1000	620/620	150×2/150×2	1.0
GT200-4T2800G/4T3150P	1000/1000	620/800	185×2/185×2	1.0

2.4 Control circuit configuration and wiring

2.4.1 Layout of control circuit terminal as follows:

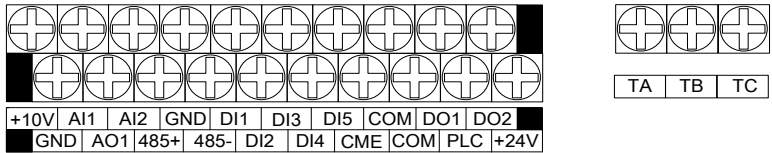


Diagram2-17 Diagram of control panel terminals arrangement

2.4.2 CN3 function description, shown as table 2-4

Type	Terminal no.	Name	Terminal function description	Specification
Communi- cation	485+	RS485 Communication interface	RS485 different signal positive terminal	Standard RS485 communication interface, please use Twisted pair or shielded wire
	485-		RS485 different signal negative terminal	
Multi-fun- ction Output terminal	DO1 DO2	Open collector Output terminal	Programmable is defined Switch output terminals with multiple functions, detail refer to output terminal function introduction of F6.11,F6.12 (Common port: COM)	Optical coupling isolation output Working voltage:9~30V Max output current :50mA
	DO3	Open collector Output terminal	Programmable is defined Switch output terminals with multiple functions, detail refer to output terminal function introduction of F6.33 (Common port: CME)	Optical coupling isolation output Working voltage:9~30V Max output current :50mA Remark: By extend card
Relay output terminal	TA TB TC	Programmable relay output terminal	Normal: TA-TB normally closed; TA-TC normally open; Action: TA-TB normally open; TA-TC normally closed (Detail refer to F6.13)	Rating of contact NO: 5A 250VAC NC: 3A 250VAC

	RA RB RC	Programmable relay output terminal	Normal: RA-RB normally closed; RA-RC normally open; Action: RA-RB normally open; RA-RC normally closed (Detail refer to F6.34)	Rating of contact NO: 5A 250VAC NC: 3A 250VAC Remark: By extend card
Analog input	AI1	Analog input AI1	Accept the input of analog voltage (Reference ground: GND)	Input voltage range: 0~ 10V (input impedance: 100K Ω) Resolution: 1/1000
	AI2	Analog input AI2	Accept input of analog current and voltage (Reference ground: GND) Selected by Jumper pin J3	Input current range: 0~ 20mA (input impedance: 165 Ω) Resolution: 1/1000
	AI3	Analog input AI3	Accept differential analog voltage input 、 PT100/PT1000 input (Reference ground: P_GND)	Input voltage range: -10V~+10V (Remark: By extend card)
Analog output	AO1	Analog output	Provide analog voltage output, Corresponding to 12 kinds of physical quantities,output frequency as factory default (refer to F6.24/F6.27)	Voltage output range: 0~ 10V Current output range: 0~ 20mA
	AO2	Analog output	Provide analog voltage output, Corresponding to 12 kinds of physical quantities,output frequency as factory default (refer to F6.25/F6.28)	Voltage output range: 0~ 10V Current output range: 0~ 20mA (Remark: By extend card)
Multi-fun ction input terminal	DI1	Multi-function input terminal 1	Programmable multi-function switch output terminals is referred to introduction about input terminal function(Switch input and output) on Chapter 6 terminals function parameters (Common port:COM) (Detail refer to	
	DI2	Multi-function input terminal 2		
	DI3	Multi-function input terminal 3		
	DI4	Multi-function input terminal 4		

	DI5	Multi-function input terminal 5	F6.00-6.04))	
	DI6	Multi-function input terminal 1	Programmable multi-function switch output terminals is referred to introduction about input terminal function(Switch input and output) on Chapter 6 terminals function parameters (Common port:COM) (Detail refer to F6.05-6.08'F6.32)	(Remark: By extend card)
	DI7	Multi-function input terminal 2		
	DI8	Multi-function input terminal 3		
	DI9	Multi-function input terminal 4		
	DI10	Multi-function input terminal 5		
Power supply	10V	+10V Power supply	Provide +10V power supply for external	Max output current:50mA
	GND	+10V power common terminal	Analog signal and reference ground of +10v power supply	Mutual inner isolation shall be produced between COM and GND
	COM	+24Vpower common terminal	Input/output public terminal of digital signal	
	+24V	+24V power supply	Digital signal power supply	Max output current:200mA
	PLC	Multi-function input public terminal	DI1—DI5 public terminal	Short circuit with 24v as factory default
	CME	Digital output common terminal	Multi-function output terminal DO1,DO2 common terminal	Short circuit with COM as factory default

2.4.3 The wiring of analog input

The terminals of AI1 and AI2 accept the input of analog signal .Input voltage (0~10V) or input current (0~20mA) are selected by the function code of F5.12.Terminal wiring as follows diagram2-18

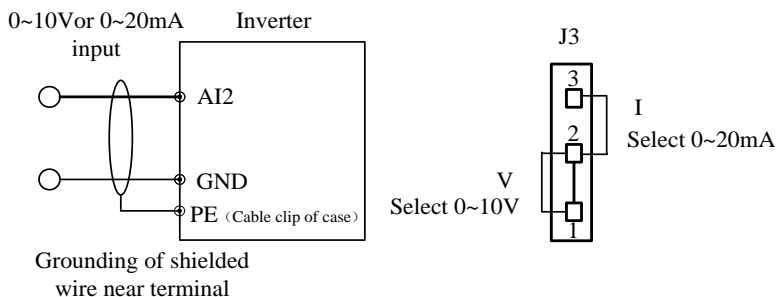


Diagram2-18 Wiring for analog input terminal

2.4.4 Inverter control circuit wiring

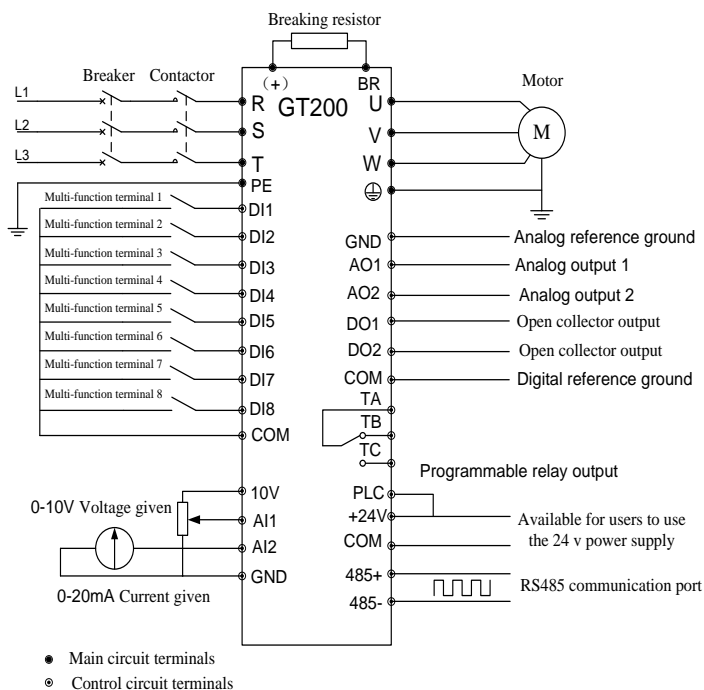


Diagram2-19 Diagram of wiring for basic running

Application model: Less than GT200-4T0220G/0300P

Introduction: Analog output AO1 can output voltage or output current. AO1 default to 0 ~ 10V voltage output, the corresponding physical output set by F6.24.

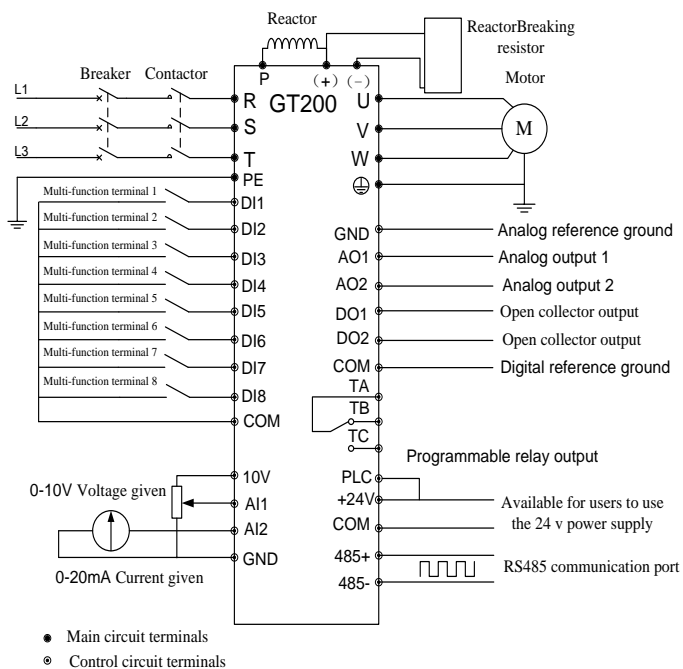


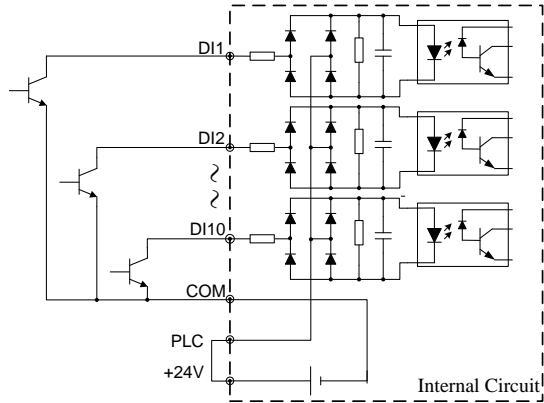
Diagram2-20 Wiring for basic running

Application model: More than GT210-4T0300G/0370P

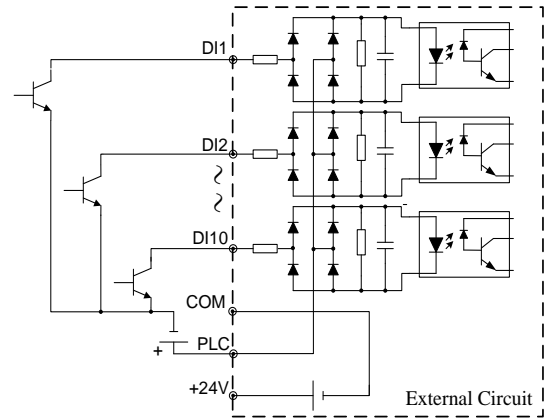
Explanation: The power more than GT200-4T2000G/4T2500P with inbuilt dc choke

2.4.5 Signal input terminal wiring

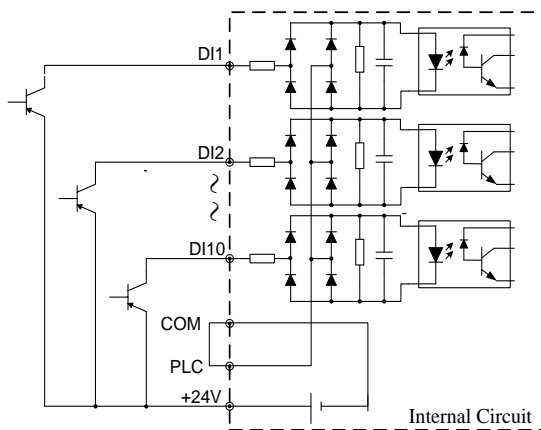
Description for NPN and PNP model switch terminal ,shown as diagram 2-21 to diagram 2-24



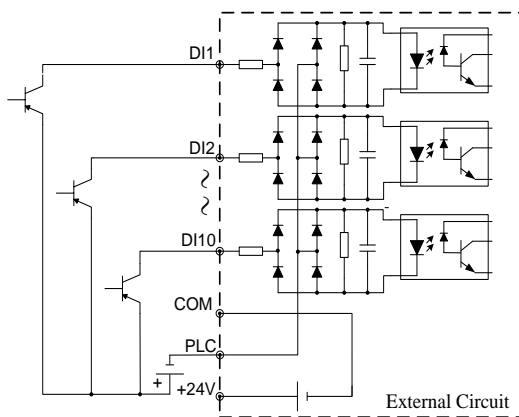
The terminals of DI6-DI10 on the extend card
Diagram2-21 Internal power supply NPN figure(OC)



The terminals of DI6-DI10 on the extend card
Diagram2-22 External power supply NPN figure(OC)



The terminals of DI6-DI10 on the extend card
 Diagram2-23 Internal power supply PNP figure (OE)



















The terminals of DI6-DI10 on the extend card
 Diagram2-24 External power supply PNP figure(OE)


Chapter 3 Frequency Inverter's operation and instruction

3.1button function description

The frequency converter operation panel is provided with 8 keys, each function definition of the key is shown in table3-1.

Table 3-1 operation panel function table

Keys	Name	Icon	Function explanation
	Edit/Exit Key		Entry or exit programming status
	Shift/monitor key		In the edit state, you can choose to set the data modification bit; in other state, switch display monitoring parameters
	Confirm key		Enter menu or data confirmation
	Rotating encoder		
	Multi-functional key		According to F0.01 set effective, ex factory value: point action control
	Operation key		In the operation keyboard mode, the button inverter operation
	Stop/ reset key		When the frequency inverter is in the normal operation condition, if the frequency innverter operates the instruction channel to set the keyboard to stop the effective way, presses this key frequency change to stop according to the set way. When the inverter is in fault state, press the key to reset the inverter and return to normal shutdown state.
	Shortcut key		Switch to different menu mode according to F0.05 value

 Tip: keys RUN, M-F, STOP/RESET characteristics are also restricted by the function code FC.31.

Project		Function Explanation	
Display function	Digital display	Display the current running state parameters and setting parameters. Note: when the parameter exceeds four digits, only the first four digits are displayed.	
	LED Indicator light	Hz、A、V	Current digital display parameters corresponding to the physical unit (current A, voltage V, frequency) The rate is Hz
		L/R	The indicator light, indicating that the inverter is in the operating panel control state;
			When the indicator light is off, the inverter is in the terminal control state;
			The indicator flashes, indicating that the inverter is running in the serial state.
		A	When the LED indicator A is on, the digital tube display parameter unit is current ampere.
		V	When the LED indicator V is on, digital display parameter unit voltage volts.
		Hz	When the LED indicator V is on, the digital tube displays the parameter unit frequency hz.
		When the LED indicator Hz and V light, digital display parameters as a percentage.	
		When the LED indicator Hz and A light, digital display parameters for speed.	
		When the LED indicator V and A light, digital display parameters for linear speed.	
		When the LED indicator lights V, A and Hz light, digital display parameters for temperature.	

Chapter 4 Function Parameters

4.1 Symbol Description:

×—means that the parameter cannot be modified during the operation process



○—means that the parameter can be modified during the operation process

●—shows actually detected parameter which cannot be modified

*—shows manufacturer retention parameter which is forbidden to modify

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ification
System management parameter F0 group					
F0.00	Parameter write protection	0: All the data is allowed to be modified; 1: Forbidden to modify except for direct setting frequency and this function code; 2: Forbidden to modify except for this function code	1	0	○
F0.01	Multifunction key selection	0: JOG function 1: Remote switchover function 2: Forward/reverse switch 3: Clearing the increment of UP/DOWN frequency setting	1	0	○
F0.02	Parameter initialization	0: No operation 1: Clear fault memory information (U0.26~U0.36) 2: Recover to factory setting (except for F0 group, and F3.00-F3.12)	1	0	×
F0.03	Parameter copy	0: No movement 1: Parameter upload 2: Parameter download 3: Parameter download(exclude related models)	1	0	*
F0.04	User code	0: No password Others: password protection	1	0	○
F0.05	Reserved				
F0.06	Inverter running dendline	0~Max timing 65.535kh	0.001kh-	0	○

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F0.07	Quick parameters group display selection	LED units digit: first parameter display selection 0: Output frequency (before compensation) 1: Output torque 2: Setting frequency 3: Output frequency (after compensation) 4: Bus voltage 5: AI1 6: AI2 7: Analog closed loop feedback 8: Analog closed loop setting 9: Output power A: Output voltage B: Output current LED tens digit: second parameter display selection 0~9: ditto LED hundreds digit: third parameter display selection 0~9: ditto LED thousands digit: fourth parameter display selection 0~9: ditto	0	0x4b20	○
F0.08	Double row LED second line running display parameter selection	Display U0 group parameters setting range: 0~37	0	1	○
Basic operation parameter F1 group					
F1.00	Control mode	0: Vector control 1: V/F control	1	1	×
F1.01	Run command channel selection	0: Operation panel run command channel (LED light on) 1: Terminal run command channel (LED light off) 2: Serial port run command channel (LED flickering)	1	0	○

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F1.02	Frequency given channel selection	0: Digital given 1, operation panel   regulating 1: Digital given 2, terminal UP/DN regulating 2: Digital given 3, serial port given 3: AI1 given 4: AI2 given 5: Terminal pulse given	1	0	○
F1.03	Numerical frequency control	LED units digit: 0: Setting frequency power down storage 1: Setting frequency power down no storage LED tens digit: 0: Stop setting frequency keeping 1: Stop setting frequency recovery	1	00	○
F1.04	Reserved				
F1.05	Reserved				
F1.06	Maximum output frequency	F1.09~550.00	0.01Hz	50.00Hz	×
F1.07	Operation frequency digit setting	Upper limiting frequency~ lower limiting frequency	0.01Hz	50.00Hz	○
F1.08	Model selection	0: G type 1: P type	1	0	×
F1.09	Upper limiting frequency	Lower limiting frequency~ maximum frequency	0.01Hz	50.00Hz	○
F1.10	Lower limiting frequency	0.00~upper limiting frequency	0.01Hz	0.00Hz	○
F1.11	Acceleration time 1	0.1~600.0 Note: default unit second; refer to FC.09 for units of acceleration and deceleration time selection	0.1s	6.0s	○
F1.12	Deceleration time 1				
F1.13	Reserved				
F1.14	Reserved				
F1.15	Reserved				
F1.16	Reserved				

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F1.17	V/F curve setting	0: User setting V/F curve (confirmed by F1.18~F1.23 function code) 1: Reduced torque characteristic curve 1(2.0 hypo-power) 2: Reduced torque characteristic curve 2(1.7 hypo-power) 3: Reduced torque characteristic curve 3(1.2 hypo-power)	1	0	×
F1.18	V/F frequency value F1	0.00~F1.20	0.01Hz	12.50Hz	×
F1.19	V/F voltage value V1	0~F1.21	0.1%	25.0%	×
F1.20	V/F frequency value F2	F1.18~F0.22	0.01Hz	25.00Hz	×
F1.21	V/F voltage value V2	F1.19~ F1.23	0.1%	50.0%	×
F1.22	V/F frequency value F3	F1.20~F3.04	0.01Hz	37.50Hz	×
F1.23	V/F voltage value V3	F1.21~100.0%	0.1%	75.0%	×
F1.24	Running direction setting	0: Forward 1: Reversal	1	0	○
F1.25	Carrier frequency setting	1~15kHz	1kHz	4kHz	○
F1.26	Carrier frequency automatic adjustment selection	0: Invalid 1: effective	1	1	○
F1.27	Reserved	-	-	-	*
On-off control F2 group					
F2.00	Start operation	LED digits: Start operation 0: Start from start frequency 1: Brake first and then start from start frequency 2: Rotate speed tracking (including direction judgment) and then start; start from start frequency when rotate speed is 0. LED ten digits: Revolving speed tracking way 0: Start from stop frequency 1: Start from zero speed 2: Start from maximum frequency	1	00	×

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F2.01	Start frequency	0.20~60.00Hz	0.01Hz	0.50Hz	○
F2.02	Start frequency retention time	0.0~10.0s	0.1s	0.0s	○
F2.03	Start DC braking current	0.0~100.0% frequency inverter rated currency	0.1%	80.0%	○
F2.04	Start DC braking time	0.0 (no action) 0.1~30.0s	0.1s	0.0s	○
F2.05	Acceleration and deceleration mode selection	0: Straight line acceleration and deceleration 1: S curve acceleration and deceleration	1	0	×
F2.06	Reserved				○
F2.07	Reserved				○
F2.08	Stop mode	0: Decelerate to stop 1: Coast to stop 2: Stop deceleration+DC braking 3: Positioning deceleration stop+DC braking	1	0	×
F2.09	Stop DC braking start frequency	0.00~60.00Hz	0.01Hz	0.00Hz	○
F2.10	Stop DC braking waiting time	0.00~10.00s	0.01s	0.00s	○
F2.11	Stop DC braking current	0.0~100.0% frequency converter rated current	0.1%	80.0%	○
F2.12	Stop DC braking time	0.0 (no action) 0.1~60.0s	0.1s	0.0s	○
F2.13	Revolving speed tracking speed	1~100	1	30	*
F2.14	Acceleration time 2	0.1~3600 Note: default unit second; refer to FC.09 for units of acceleration and deceleration time selection	0.1	Model determined	○
F2.15	Deceleration time 2		0.1		○
F2.16	Acceleration time 3		0.1		○
F2.17	Deceleration time 3		0.1		○
F2.18	Acceleration time 4		0.1		○

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F2.19	Deceleration time ₄		0.1		○
F2.20	Jog operation frequency	0.10～50.00Hz	0.01Hz	5.00Hz	○
F2.21	Jog interval time	0.0～100.0s	0.1s	0.0s	○
F2.22	Jog acceleration time	0.1～60.0s	0.1	Model determined	○
F2.23	Jog deceleration time	0.1～60.0s	0.1		○
F2.24	Skip frequency 1	0.00～550.0Hz	0.01Hz	0.00Hz	×
F2.25	Skip frequency 1 range	0.00～30.00Hz	0.01Hz	0.00Hz	×
F2.26	Skip frequency 2	0.00～550.0Hz	0.01Hz	0.00Hz	×
F2.27	Skip frequency 2 range	0.00～30.00Hz	0.01Hz	0.00Hz	×
F2.28	Skip frequency 3	0.00～550.0Hz	0.01Hz	0.00Hz	×
F2.29	Skip frequency 3 range	0.00～30.00Hz	0.01Hz	0.00Hz	×
F2.30	Anti-reverse selection	0: Reverse allowed 1: Reverse prohibited	1	0	×
F2.31	Forward and reverse dead time	0～3600s	0.1s	0.0s	×
F2.32	Zero frequency operation allows selection	0: Zero frequency allows operation 1: zero frequency forbid operation	1	0	×
Motor parameter F3 group					
F3.00	Motor poles	2～14	2	4	×
F3.01	Rated power	0.4～999.9kW	0.1kW	Models determined	×
F3.02	Rated current	0.1～999.9A	0.1A		×
F3.03	Rated speed	1rpm～9999rpm	1rpm	1470rpm	×
F3.04	Rated frequency	1.00～550.00Hz	0.01Hz	Models determined	○

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F3.05	Rated voltage	1~480V	1 V		×
F3.06	No-loading current I0	0.1~999.9A	0.1mH		×
F3.07	Stator resistance R1	0.000~50.000Ω	0.001Ω		○
F3.08	leakage inductive reactanceX	0.0~999.9mH	0.1mH		○
F3.09	Rotor resistance R2	0.000~50.000Ω	0.001Ω		○
F3.10	Mutual inductance	0.0~999.9mH	0.1mH		○
F3.11	Parameter self-tuning	0: No movement 1: Movement(Motor static)	1	0	×
F3.12	Motor stability factor	0~255	1	3	○
F3.13	Torsion rising setting	0.1%~30.0%	0.1%	10.0%	○
F3.14	Torsion rising cutoff point	0.00~F1.04	0.01Hz	50.00Hz	○
F3.18	Torsion rising gain2	0~500	1	10	○
F3.19	Torsion rising integral time2	1~1000	1	500	○
F3.20	Auto torsion rising limit	0~100.0%	1%	30%	×
Swing frequency parameter F4 group					
F4.00	Velocity filtering time	0.1~20.0ms	0.1	1.0ms	○
F4.01	Speed ring (ASR) proportional gain	0~10.00	0.01	2.00	○
F4.02	Speed ring (ASR) integral time	0.01~10.00	0.01	0.2	○
F4.06	Vector motor stability factor	0~50	1	10	○
F4.07	Weak magnetic automatic gain	20.0~500.0	0.1%	100	○
F4.08	Vector torque limitation	2~200.0	0.1%	200	*
F4.09	Vector torque increases	0.0~400.0	0.1%	200	*
F4.10	Velocity filtering coefficient	0.0~20.0	0.1	1.0	*
F4.11	Cut-off frequency	0~100	0	18	*

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F4.12	Current loop proportional gain	0.01~10.00	0.01	0.20	*
F4.13	Current loop integral time	0.01~10.00	0.01	0.20	*
Analog quantity terminal parameter F5 group					
F5.00	Frequency given curve selection	LED units digit: AI1 frequency curve selection 0: Curve 1 1: Curve 2 LED tens digit: AI2 frequency curve selection 0: Curve 1 1: Curve 2 LED hundreds digit: Pulse frequency curve selection 0: Curve 1 1: Curve 2 LED thousands digit: Expansion card AI3 frequency curve selection 0: Curve 1 1: Curve 2 2: Extension curve 3 3: Extension curve 4 Note: Extension curve 3、4 function code see detail in AO group	1	000	○
F5.01	Given channel gain	0.000~9.999	0.001	1.001	○
F5.02	Given smoothing constant	0.001~50.000s	0.001s	0.500s	○
F5.03	Maximum input pulse frequency	0.1~50.0kHz	0.1kHz	10.0kHz	○
F5.04	Curve 1 minimum given	0.0%~F5.06 (Specific value between minimum given value 1 and reference value 10V/20mA/F5.03)	0.1%	0.0%	○
F5.05	Curve 1 minimum given corresponding frequency	0.00~F1.06	1	0.00Hz	○
F5.06	Curve 1 maximum given	F5.04~100.0% (Specific value between maximum given value 1 and reference value 10V/20mA/F5.03)	0.1%	100.0%	○

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F5.07	Curve 1 maximum given corresponding frequency	0.00~F1.06	1	50.00Hz	○
F5.08	Curve 2 minimum given	0.0%~F5.10 (Specific value between minimum given value 2 and reference value 10V/20mA/F1.03)	0.1%	0.1%	○
F5.09	Curve 2 minimum given corresponding frequency	0.00~F1.06	1	0.00Hz	○
F5.10	Curve 2 maximum given	F5.08~100.0% (Specific value between maximum given value 2 and reference value 10V/20mA/F5.03)	0.1%	100.0%	○
F5.11	Curve 2 maximum given corresponding frequency	0.00~F1.06	1	50.00Hz	○
F5.12	Analog input voltage current type selection	LED digit: AI1 input type selection 0: Voltage 1: Current LED ten digit: AI2 input type selection 0: Voltage 1: Current LED hundreds digit: Reserved	1	000	○
F5.13	Reserved	-	-	0	*
F5.14	Reserved	-	-	0	*
Digital quantity terminal parameter F6 group					
F6.00	Multifunction input terminal DI1 Function selection	0: No function 1: Multistage frequency terminal 1 2: Multistage frequency terminal 2 3: Multistage frequency terminal 3 4: Acceleration and deceleration time terminal 1	1	36	×

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F6.01	Multifunction input terminal DI2 Function selection	5: Acceleration and deceleration time terminal 2 6: External fault normally open input 7: External fault normally close input 8: External reset (<u>STOP/RESET</u>) input 9: External Forward jog control		37	
F6.02	Multifunction input terminal DI3 Function selection	10: External reverse jog control 11: Free stop input (FRS) 12: Freq. increasing command (UP) 13: Freq. decreasing command (DOWN) 14: Simple PLC Suspend running command 15: Acceleration and deceleration forbidden command		8	
F6.03	Multifunction input terminal DI4 Function selection	16: Three-wire operation control 17: External interruption normally open contact input 18: External interruption normally close contact input 19: Stop DC braking input command DB 20: Ineffective closed loop 21: PLC failure		1	
F6.04	Multifunction input terminal DI5 Function selection	22: Frequency source selection 1 23: Frequency source selection 2 24: Frequency source selection 3 25: Frequency switch to AI2 26: Reserved 27: Command switch to terminal 28: Command source selection 1 29: Command source selection 2 30: Multistage closed-loop given terminal 1		2	
F6.05	Multifunction input terminal DI6 Function selection	31: Multistage closed-loop given terminal 2 32: Multistage closed-loop given terminal 3 33: Reserved 34: Reserved 35: External stop command (Effective to all the control		3	

Parameter code	Parameter name	Setting range	Mini munit	Default value	Mod ition
F6.06	Multifunction input terminal DI7 Function selection	modes, stop according to the current stop mode) 36: FWD terminal function 37: REV terminal function 38: Frequency inverter running prohibited 39: Length reset 40: Auxiliary given frequency reset		9	
F6.07	Multifunction input terminal DI8 Function selection	41: PLC halt memory clear away 42: Counter reset signal input 43: Counter trigger signal input 44: Length counting input (only for DI5 setting) 45: Pulse frequency input (only for DI5 setting) 46: Single phase speed measurement input (only for DI5 setting)		0	
F6.08	Expansion card multifunctional input terminal DI9 function selection	47: Reserved 48: Reserved 49: Multiple frequency terminals 50: Multistage closed-loop given terminal 51: Frequency Source switching 52: Deceleration stop command input		0	
F6.09	FWD/REV operation mode setting	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire operation control 1—self-hold function (additional any terminal among DI1~DI10) 3: Three-wire operation control 2—self-hold function (additional any terminal among DI1~DI10)	1	0	×
F6.10	UP/DN rate	0.01~99.99Hz/s	0.01 Hz/s	1.00Hz/s	○

Parameter code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F6.11	Bothway open collector output terminal DO1	0: Inverter running indication (RUN) 1: Frequency arrival signal (FAR) 2: Frequency level detection signal (FDT1) 3: Frequency level detection signal (FDT2) 4: Overload detection signal (OL) 5: Stop for undervoltage block (LU) 6: External fault halt (EXT) 7: Frequency upper limit (FHL) 8: Frequency lower limit (FLL) 9: Frequency converter zero-speed running 10: Simple PLC stage running completion instruction	1	0	×
F6.12	Bothway open collector output terminal DO2	11: PLC circulation completion indication 12: Reach setting count value 13: Reach specified count value 14: Setting length arrival indication 15: Frequency converter running preparation completed (RDY) 16: Frequency converter fault 17: Upper computer switching signal 18: Swing frequency upper and lower limit 19: Reach setting accumulated running time Note: The following functions are inapplicable to DO1 and relay output. 20: Output frequency before slip reimbursement (0~maximum) 21: Output frequency after slip reimbursement (0~maximum)	1	1	×

Parameter code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F6.13	Relay output function selection(TA/TB/TC)	22: Setting frequency (0~maximum) 23: Output current (0~2*Iei) 24: Output current (0~2*Iem) 25: Output torque (0~2*Tem) 26: Output voltage (0~1.2*Ve) 27: Busbar voltage (0~800V) 28: AI1 (0~10V) 29: AI2 (0~10V/0~20mA) 30: Output power (0~2*Pe) 31: Upper computer percentage (0~65535) 32: Expansion card AI3(-10~10V/-20mA~20Ma)	1	16	×
F6.14	FDT1 level	0.00~550.0Hz	0.01Hz	50.00Hz	○
F6.15	FDT1 lag	0.00~550.0Hz	0.01Hz	1.00Hz	○
F6.16	FDT2 level	0.00~550.0Hz	0.01Hz	25.00Hz	○
F6.17	FDT2 lag	0.00~550.0Hz	0.01Hz	1.00Hz	○
F6.18	Frequency reaches (FAR) detection width	0.00~550.0Hz	0.01Hz	2.50Hz	○
F6.19	Reserved	-	-	0	○
F6.20	DO2 maximum output pulse	0.1~50.0kHz	0.1k	10.0k	○
F6.21	Counter reset value setting (Setting count value reached given value)	F6.22~9999	1	0	○
F6.22	Counter detection value setting (Setting count value reached given value)	0~F6.21	1	0	○

Parameter code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F6.23	Terminal positive and negative logic	Binary system setting 0: Breakover effective 1: Disconnect effective LED units digit: BIT0~BIT3: DI1~DI4 LED tens digit: BIT0~BIT3: DI5~DI8 LED hundreds digit: BIT0~BIT1: FWD、REV BIT2~BIT3: DO1、DO2 LED thousands digit: Reserved	1	0000	○
F6.24	AO1 output function selection	0: Output frequency before slip reimbursement (0~maximum) 1: Output frequency after slip reimbursement (0~maximum) 2: Setting frequency (0~maximum) 3: Output current (0~2*Iei) 4: Output current (0~2*Iem) 5: Output torque (0~2*Tem)	1	0	○
F6.25	Expansion card AO2 output function selection	6: Output voltage (0~1.2*Ve) 7: Busbar voltage (0~800V) 8: AI1 (0~10V) 9: AI2 (0~10V/0~20mA) 10: Output power (0~2*Pe) 11: Upper computer percentage (0~65535) 12: AI3(-10V~10V/-20mA~20Ma)	1	3	○
F6.26	Analog output range selection	LED units digit: AO1 bias selection 0: 0~10V or 0~20mA 1: 2~10V or 4~20mA LED tens digit: Expansion card AO2 bias selection 0: 0~10V or 0~20mA 1: 2~10V or 4~20mA	1	00	○
F6.27	AO1 output gain	0.0~200.0%	0.1%	100.0%	○
F6.28	Expansion card AO2 output gain	0.0~200.0%	0.1%	100.0%	○

Parametr code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F6.29	Analog output voltage current type selection	LED digit: AO1 output type selection 0: Voltage 1: Current LED ten digit: Expansion card AO2 output type selection 0: Voltage 1: Current	1	00	○
F6.30	Common IO filtering time	0.000~10.000s	0.001s	0.002s	○
F6.31	Pulse input filtering time	0.00~10.00s	0.01s	0.10s	○
F6.32	Expansion card DI10 input function selection	Same function code F6.00	1	0	○
F6.33	Expansion card DO3 output function selection	Same function code F6.11	1	0	○
F6.34	Expansion card relay output RA/RB/RC	Same function code F6.13	1	0	○
F6.35	Reserved	-	-	0	*
Human-computer interface F7 group					
F7.00	Overvoltage stall point	380V Model: 120.0~150.0%Udce 220V Model: 100.0~130.0%Udce	0.1%		×
F7.01	Overvoltage control voltage	0.00~1.00v	0.01V	0.10V	×
F7.02	Overvoltage stall gain Kp1	0~100	1	6	×
F7.03	Overvoltage stall integral time Ki1	0~1000	1	100	×
F7.04	Overvoltage stall gain Kp2	0.0~10.0	0.1	4.0	×
F7.05	Overvoltage stall integral time Ki2	0~50	1	10	×
F7.06	Over current stall level	20.0%~200.0%	0.1%	150.0%	×

F7.07	Over current stall action selection	0: Constant speed ineffective 1: Constant speed effective Note: Acceleration and deceleration is always effective	1	1	×
F7.08	Over current stall gain Kp	0~100	1	6	×
F7.09	Over current stall integral time	1~1000	1	100	×
F7.10	Rotational speed tracking gain KP	0~100	1	10	×
F7.11	rotational speed tracking integral time	1~1000	1	50	×
F7.12	Rotational speed tracking acceleration	0.1~60.0S	0.1s	6.0s	
F7.13	Rotational speed tracking judging threshold	1~100%	1%	10%	
F7.14	Instantaneous stop/no stop function selection	0: No action 1: decelerated 2: Ramp to stop	1	0	×
PID control parameter F8 group					
F8.00	Closed loop running control selection	0: No action 1: Action	1	0	×
F8.01	Given channel selection	0: Number given; (Refer to F8.06 when F8.02=6; refer to F8.05 in other conditions) 1: AI1; 2: AI2; 3: AI3(Expansion card) Note: For speed closed loop, analog given 10V for synchronous speed of maximum frequency F1.06	1	1	○

F8.02	Feedback channel selection	0: AI1; 1: AI2; 2: AI1+AI2; 3: AI1-AI2; 4: MIN (AI1, AI2) ; 5: MAX (AI1, AI2) ; 6: Pulse: (PG closed loop single\double is confirmed by terminal) 7: AI3(Expansion card) ;	1	1	○
F8.03	Given channel smoothing	0.001~50.000s	0.001s	0.500s	○
F8.04	Feedback channel smoothing	0.001~50.000s	0.001s	0.500s	○
F8.05	Given quantity number setting	0.00V~10.00V	0.01	0.00	○
F8.06	Speed closed loop given	0~39000RPM	1	0	○
F8.07	Pulse encoder every revolution	1~20000	1	1024	○
F8.08	Minimum given quantity	0.0%~(F8.10) (The percentage of minimum given quantity and reference value 10V;20mA)	0.1%	0.0	○
F8.09	Corresponding feedback quantity of minimum given quantity	0.0~100.0% (The percentage of corresponding feedback quantity of minimum given quantity and reference value 10V;20mA)	0.1%	0.0%	○
F8.10	Maximum given quantity	(F8.08)~100.0% (The percentage of maximum given quantity and reference value 10V;20mA)	0.1%	100.0%	○
F8.11	Corresponding feedback quantity of maximum given quantity	0.0~100% (The percentage of corresponding feedback quantity of maximum given quantity and reference value 10V;20mA)	0.1%	100.0%	○
F8.12	Proportional gain KP	0.000~9.999	0.001	2.000	○
F8.13	Integral gain Ki	0.000~9.999	0.001	0.100	○
F8.14	Sampling period	0.001~50.000s	0.001s	0.100s	○

Parametr code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F8.15	Deviation extremity	0.0~20.0% (Corresponding closed loop given value)	0.1%	2.0%	○
F8.16	Closed loop regulating characteristic	0: Direct action 1: Reaction Note: Relation between given speed and rotate speed	1	0	×
F8.17	Sleeping frequency	0.00Hz~550.0Hz	0.01Hz	0	*
F8.18	Closed loop preset frequency	0.00~550.0Hz	0.01Hz	0.00Hz	○
F8.19	Closed loop preset frequency hold time	0.0~3600s	0.1s	0.0s	×
F8.20	Multistage closed loop given 1	0.00~10.00V	0.01V	0.00V	○
F8.21	Multistage closed loop given 2	0.00~10.00V	0.01V	0.00V	○
F8.22	Multistage closed loop given 3	0.00~10.00V	0.01V	0.00V	○
F8.23	Multistage closed loop given 4	0.00~10.00V	0.01V	0.00V	○
F8.24	Multistage closed loop given 5	0.00~10.00V	0.01V	0.00V	○
F8.25	Multistage closed loop given 6	0.00~10.00V	0.01V	0.00V	○
F8.26	Multistage closed loop given 7	0.00~10.00V	0.01V	0.00V	○
F8.27	Multistage closed loop given 8	0.00~10.00V	0.01V	0.00V	○
F8.28	Multistage closed loop given 9	0.00~10.00V	0.01V	0.00V	○

Parametr code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F8.29	Multistage closed loop given 10	0.00~10.00V	0.01V	0.00V	○
F8.30	Multistage closed loop given 11	0.00~10.00V	0.01V	0.00V	○
F8.31	Multistage closed loop given 12	0.00~10.00V	0.01V	0.00V	○
F8.32	Multistage closed loop given 13	0.00~10.00V	0.01V	0.00V	○
F8.33	Multistage closed loop given 14	0.00~10.00V	0.01V	0.00V	○
F8.34	Multistage closed loop given 15	0.00~10.00V	0.01V	0.00V	○
F8.35	Closed-loop output polarity selection	Digit: 0: Cosed-loop output is negative value, zero frequency run 1: Cosed-loop output is negative value, reverse, But if F2.30 is set to forbid reverse, inverter will run at lowest frequency. Ten digit: 0: PID high and low limits do not change 1: PID high and low limits is decided by AI	1	0x00	○
F8.36	Closed-loop feedback lost movement selection	0: no closed-loop feedback loss detection 1: closed-loop feedback loss detection, stop while detection, display fault E20	1	0	○
F8.37	Process closed loop feedback loss detection value	0.0~100% The maximum output frequency is 100%	0.1%	10%	○
F8.38	Process closed loop feedback loss detection time	0.0s~20.0s	0.1s	1.0s	○
F8.39	Sleeping threshold	0.00V~10.00V	0.01V	10.00V	○

Parameter code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F8.40	Wakeing threshold	0.00V~10.00V	0.01V	0.00V	○
F8.41	Sleeping time	0.1s~600.0s	0.1s	300.0s	○
F8.42	Waking time	0.1s~600.0s	0.1s	300.0s	○
F8.43	Limits acceleration and deceleration of closed-loop	2.0%~100.0%(Relative to maximum closed loop feedback)	0.1%	100%	○
Multistage speed control parameter F9 group					
F9.00	Simple PLC running mode selection	LED units digit: PLC running mode 0: No action 1: Stop after single loop 2: Keep final value after single loop 3: Continuous loop LED tens digit: start mode 0: Rerun from the first stage 1: Continue to run from the stage of halt (or fault) 2: Continue to run from the stage, frequency of halt (or fault) LED hundreds digit: power down storage 0: No storage 1: Store the stage and frequency of power down moment LED thousands digit: stage time unit selection 0: second 1: minute	1	0000	×
F9.01	Multistage frequency 1	F1.10(lower limit frequency)~F1.09(upper limit frequency)	0.01Hz	5.00Hz	○
F9.02	Multistage frequency 2	F1.10(lower limit frequency)~F1.09(upper limit frequency)	0.01Hz	10.00Hz	○
F9.03	Multistage frequency 3	F1.10(lower limit frequency)~F1.09(upper limit frequency)	0.01Hz	20.00Hz	○
F9.04	Multistage frequency 4	F1.10(lower limit frequency)~F1.09(upper limit frequency)	0.01Hz	30.00Hz	○

Parameter code	Parameter name	Setting range	Minimum unit	Default value	Modification
F9.05	Multistage frequency 5	F1.10(lower limit frequency)~ F1.09(upper limit frequency)	0.01Hz	40.00Hz	○
F9.06	Multistage frequency 6	F1.10(lower limit frequency)~ F1.09(upper limit frequency)	0.01Hz	45.00Hz	○
F9.07	Multistage frequency 7	F1.10(lower limit frequency)~ F1.09(upper limit frequency)	0.01Hz	50.00Hz	○
F9.08	Stage 1 setting	LED units digit: 0: Multistage frequency 1(F9.01) 1: Determined by F1.02 function code 2: Multistage closed loop given 1(F8.20) 3: Determined by F8.01 function code LED tens digit: 0: Forward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.09	Stage 1 running time	0.0~6500.0s	0.1	20.0	○

F9.10	Stage 2 setting	<p>LED units digit:</p> <p>0: Multistage frequency 2(F9.02)</p> <p>1: Determined by F1.02 function code</p> <p>2: Multistage closed loop given 2(F8.21)</p> <p>3: Determined by F8.01 function code</p> <p>LED tens digit:</p> <p>0: Foreward</p> <p>1: Reversal</p> <p>2: Determined by run command</p> <p>LED hundreds digit:</p> <p>0: Acceleration and deceleration time 1</p> <p>1: Acceleration and deceleration time 2</p> <p>2: Acceleration and deceleration time 3</p> <p>3: Acceleration and deceleration time 4</p>	1	000	○
F9.11	Stage 2 running time	0.0~6500.0s	0.1	20.0	○

F9.12	Stage 3 setting	<p>LED units digit:</p> <p>0: Multistage frequency 3(F9.03)</p> <p>1: Determined by F1.02 function code</p> <p>2: Multistage closed loop given 3(F8.22)</p> <p>3: Determined by F8.01 function code</p> <p>LED tens digit:</p> <p>0: Foreward</p> <p>1: Reversal</p> <p>2: Determined by run command</p> <p>LED hundreds digit:</p> <p>0: Acceleration and deceleration time 1</p> <p>1: Acceleration and deceleration time 2</p> <p>2: Acceleration and deceleration time 3</p> <p>3: Acceleration and deceleration time 4</p>	1	000	○
F9.13	Stage 3 running time	0.0~6500.0s	0.1	20.0	○

F9.14	Stage 4 setting	<p>LED units digit:</p> <p>0: Multistage frequency 4(F9.04)</p> <p>1: Determined by F1.02 function code</p> <p>2: Multistage closed loop given 4(F8.23)</p> <p>3: Determined by F8.01 function code</p> <p>LED tens digit:</p> <p>0: Foreward</p> <p>1: Reversal</p> <p>2: Determined by run command</p> <p>LED hundreds digit:</p> <p>0: Acceleration and deceleration time 1</p> <p>1: Acceleration and deceleration time 2</p> <p>2: Acceleration and deceleration time 3</p> <p>3: Acceleration and deceleration time 4</p>	1	000	○
F9.15	Stage 4 running time	0.0~6500.0s	0.1	20.0	○

9.16	Stage 5 setting	<p>LED units digit: 0: Multistage frequency 4(F9.04) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.23) 3: Determined by F8.01 function code</p> <p>LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command</p> <p>LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4</p>	1	000	○
F9.17	Stage 5 running time	0.0~6500.0s	0.1	20.0	○
F9.18	Stage 6 setting	<p>LED units digit: 0: Multistage frequency 4(F9.04) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.23) 3: Determined by F8.01 function code</p> <p>LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command</p> <p>LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4</p>	1	000	○

Parameter code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
F9.19	Stage 6 running time	0.0~5500	0.1	20.0	○
9.20	Stage 7 setting	LED units digit: 0: Multistage frequency 4(F9.04) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.23) 3: Determined by F8.01 function code LED tens digit: 0: Forward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.21	Stage 7 running time	0.0~6500.0s	0.1	20.0	○
F9.22	Multistage frequency8	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	40.00Hz	○
F9.23	Multistage frequency9	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	45.00Hz	○
F9.24	Multistage frequency10	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	50.00Hz	○
F9.25	Multistage frequency11	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	50.00Hz	○
F9.26	Multistage frequency12	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	50.00Hz	○
F9.27	Multistage frequency13	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	50.00Hz	○

F9.28	Multistage frequency14	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	50.00Hz	○
F9.29	Multistage frequency15	F1.10(Lowest frequency)~F1.09(Highest frequency)	0.01Hz	50.00Hz	○
F9.30	Stage 8 setting	LED units digit: 0: Multistage frequency 4(F9.23) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.27) 3: Determined by F8.01 function code LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.31	Stage 8 running time	0.0~6500.0s	0.1	0.0	○

F9.32	Stage 9 setting	<p>LED units digit:</p> <p>0: Multistage frequency 4(F9.24)</p> <p>1: Determined by F1.02 function code</p> <p>2: Multistage closed loop given 4(F8.28)</p> <p>3: Determined by F8.01 function code</p> <p>LED tens digit:</p> <p>0: Foreward</p> <p>1: Reversal</p> <p>2: Determined by run command</p> <p>LED hundreds digit:</p> <p>0: Acceleration and deceleration time 1</p> <p>1: Acceleration and deceleration time 2</p> <p>2: Acceleration and deceleration time 3</p> <p>3: Acceleration and deceleration time 4</p>	1	000	○
F9.33	Stage 9 running time	0.0~6500.0s	0.1	0.0	○
F9.34	Stage 10 setting	<p>LED units digit:</p> <p>0: Multistage frequency 4(F9.25)</p> <p>1: Determined by F1.02 function code</p> <p>2: Multistage closed loop given 4(F8.29)</p> <p>3: Determined by F8.01 function code</p> <p>LED tens digit:</p> <p>0: Foreward</p> <p>1: Reversal</p> <p>2: Determined by run command</p> <p>LED hundreds digit:</p> <p>0: Acceleration and deceleration time 1</p> <p>1: Acceleration and deceleration time 2</p> <p>2: Acceleration and deceleration time 3</p> <p>3: Acceleration and deceleration time 4</p>	1	000	○

F9.35	Stage 10 running time	0.0~6500.0s	0.1	0.0	○
F9.36	Stage 11 setting	LED units digit: 0: Multistage frequency 4(F9.26) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.30) 3: Determined by F8.01 function code LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.37	Stage 11 running time	0.0~6500.0s	0.1	0.0	○

F9.38	Stage 12 setting	LED units digit: 0: Multistage frequency 4(F9.26) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.31) 3: Determined by F8.01 function code LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.39	Stage 12 running time	0.0~6500.0s	0.1	0.0	○
F9.40	Stage 13 setting	LED units digit: 0: Multistage frequency 4(F9.27) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.32) 3: Determined by F8.01 function code LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○

F9.41	Stage 13 running time	0.0~5500	0.1	0.0	○
F9.42	Stage 14 setting	LED units digit: 0: Multistage frequency 4(F9.28) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.33) 3: Determined by F8.01 function code LED tens digit: 0: Foreward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.43	Stage 14 running time	0.0~6500.0s	0.1	0.0	○

F9.44	Stage 15 setting	LED units digit: 0: Multistage frequency 4(F9.29) 1: Determined by F1.02 function code 2: Multistage closed loop given 4(F8.34) 3: Determined by F8.01 function code LED tens digit: 0: Forward 1: Reversal 2: Determined by run command LED hundreds digit: 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	1	000	○
F9.45	Stage 15 running time	0.0~6500.0s	0.1	0.0	○
Protection function parameter FA group					
FA.00	Motor overload protection mode selection	0: No action 1: Common motor (with low speed reimbursement) 2: Variable frequency motor (without low speed reimbursement)	1	1	×
FA.01	Motor overload protection coefficient	20.0~110.0%	0.1%	100.0%	×
FA.02	Motor over-temperature protection threshold	0℃~200℃	1	110	*
FA.03	Motor over-temperature warning threshold	0℃~200℃	1	90	*

FA.09	Automatic reset times	0~10.0 shows no automatic reset function Note: Module protection and external device fault has no reset function.	1	0	×
FA.10	Automatic reset interval time	2.0~20.0s	0.1s	5.0s	×
FA.11	Overload pre-alarm detection setting	LED units digit: Action selection 0: Detecting all the time 1: Detect only in constant speed LED tens digit: Alarming selection 0: No alarming, continue to run 1: Alarm, halt LED hundreds digit: Detection quantity selection 0: Relative to motor rated current (E008) 1: Relative to frequency converter rated current (E009)	1	000	×
FA.12	Overload pre-alarm detection level	20.0%~200.0%	0.1%	130.0%	×
FA.13	Overload pre-alarm detection time	0.0~60.0s	0.1s	5.0s	×

FA.14	Protective action selection 1	<p>LED units digit: Undervoltage fault indication action selection 0: No action 1: Action (regard undervoltage as fault)</p> <p>LED tens digit: Automatic reset interval fault indication action selection 0: No action 1: Action</p> <p>LED hundreds digit: Fault lock function selection 0: Prohibited 1: Open (Fault indication no action) 2: Open (Fault indication action)</p> <p>LED thousands digit: Default phase action selection 0: Both input and output default phase are protected 1: Input default phase no action 2: Output default phase no action 3: Both input and output default phase no action</p>	1	0000	×
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FA.15	Protective action selection 2	<p>LED units digit: communication abnormal action selection 0: Alarming and free halt 1: No alarming and continue to run 2: No alarming and stop according to stop mode(Only in serial port control mode) 3: No alarming and stop according to stop mode(In all control modes)</p> <p>LED tens digit: Contactor abnormal action selection 0: Alarming and free halt 1: No alarming and continue to run</p> <p>LED hundreds digit: EEPROM abnormal action selection 0: Alarming and free halt 1: No alarming and continue to run</p>	1	0001	×
Serial port communication parameter FB group					
Fb.00	Local address	<p>0: Main Machine address 1~247: Other machine address</p>	1	1	×

Fb.01	Communication configuration	LED units digit: Baud rate selection 0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS LED tens digit: data format 0: 1-8-2-N format, RTU 1: 1-8-1-E format, RTU 2: 1-8-1-O format, RTU 3: 1-7-2-N format, ASCII 4: 1-7-1-E format, ASCII 5: 1-7-1-O format, ASCII 6: 1-8-1-N format, RTU LED hundreds digit: analog input terminal 0: Ineffective 1: Effective	1	0003	×
Fb.02	Reserved	-	-	0	*
Fb.03	Local response delay	0~1000ms	1	5ms	×
Fb.04	Communication overtime detection time	0.0~1000s	0.1	0.0s	×
Fb.05	Host routing	00~11	0	11	×
Fb.06	Linkage ratio setting	0.01~10.00	0.01	1.00	○
Advanced function parameter FC group					
FC.00	Dynamic braking selection	0~2	1	1	×
FC.01	Braking usage rate	0~5	1	3	×
FC.02	AVR function	0: No action 1: Action all the time 2: No action only in deceleration	1	2	×

Parametr code	Parameter name	Setting range	Mini munit	Default valu	Mod ition
FC.03	Automatic energy saving running	0: No action 1: Action	1	0	○
FC.04	Slip compensation enabled	0: No enabled 1: Enabled	1	0	○
FC.05	Slip compensation filtering time	0.1~20.0ms	0.1ms	1.0ms	○
FC.06	Reserved				
FC.07	Reserved				
FC.08	Cooling fan control	0: Automatic running Note: Run for 3 minutes after stop 1: Fan always running when power on 2: Fan starts running when operating temperature is above 45℃, stops when temperature is below 40℃	1	0	×
FC.09	Acceleration and deceleration time unit	0: (second) 1: (minute)	0	0	×
FC.10	Droop control	0.00~10.00Hz	0.01Hz	0.00Hz	○
FC.11	Acceleration and deceleration time filter coefficient	0.1~100.0	0.1	1.0	○
FC.12	Zero frequency running threshold value	0.00~550.00Hz	0.01Hz	0.00Hz	○
FC.13	Zero frequency return difference	0.00~550.00Hz	0.01Hz	0.00Hz	○
FC.14	Setting length	0.000 (Fixed length halt function ineffective) ~65.535(km)	0.001 (km)	0.000 (km)	○

Parameter code	Parameter name	Setting range	Min unit	Default value	Modification
FC.15	Actual length	0.000~65.535(km) (power down storage)	0.001 (km)	0.000 (km)	○
FC.16	Length multiplying power	0.001~30.000	0.001	1.000	○
FC.17	Length correction coefficient	0.001~1.000	0.001	1.000	○
FC.18	Measurement axis perimeter	0.01~100.00(cm)	0.01 (cm)	10.00(cm)	○
FC.19	Axis pulse per turn	1~9999	1	1	○
FC.20	Setting running time	0~Max timing 65.535kh	0.001kh	0	○
FC.21	Dead-time compensation coefficient	0~20	1	2	×
FC.22	Power failure restart function selection	0: No action 1: Action	1	0	×

FC.24	Run command channel binding frequency given channel	<p>LED units digit: Frequency channel selection when keyboard is started or stopped</p> <p>0: No binding 1: Keyboard ▲ ▼ given 2: Terminal UP/DN given 3: Serial port given 4: AI1 analog given 5: AI2 analog given 6: Terminal pulse given 7: Reserved 8: Expansion card AI3 analog given</p> <p>LED tens digit: Frequency channel selection when terminal is started or stopped</p> <p>0: No binding 1: Keyboard ▲ ▼ given 2: Terminal UP/DN given 3: Serial port given 4: AI1 analog given 5: AI2 analog given 6: Terminal pulse given 7: Reserved 8: Expansion card AI3 analog given</p> <p>LED hundreds digit: Frequency channel selection when serial port is started or stopped</p> <p>0: No binding 1: Keyboard ▲ ▼ given 2: Terminal UP/DN given 3: Serial port given 4: AI1 analog given 5: AI2 analog given 6: Terminal pulse given 7: Reserved 8: Expansion card AI3 analog given</p>	1	000	○
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FC.25	Auxiliary given channel	0: No action; 1: Keyboard ▲ ▼ given (given by FC.27 directly); 2: Terminal UP/DN given (given by FC.27 directly); 3: Serial port given (given by FC.27 directly); 4: AI1; 5: AI2; 6: PULSE; 7: -AI1; 8: -AI2; 9: -PULSE 10: AI1-5; 11: AI2-5; 12: PULSE-1/2*F1.03 13: Reserved 14: AI3(Expansion card) Note: Ineffective when it is the same as main given channel; frequency of item 4-9、item14 uses parameters confirmed in F5.00	1	0	○
FC.26	Analog auxiliary given coefficient	0.00~9.99 (only for FC.25=4~12)	0.01	1.00	○
FC.27	Figure auxiliary frequency	0.00~550.0Hz	0.01	0.00Hz	○
FC.28	Figure auxiliary frequency control	LED units digit: Storage control 0: Power down storage 1: Power down no storage LED tens digit: 0: halt holding 1: halt reset LED hundreds digit: Frequency polarity 0: positive 1: negative Note: Only effective to FC.25=1,2,3	1	000	○
FC.29	Outage time	0~6553.6s	0.1s	10s	○
FC.30	Pulse breakage detection time	0~6553.6s	0.1s	0s	○

FC.31	Operation panel key function and lock selection	<p>LED units digit: STOP/RESET key function selection</p> <p>0: Ineffective in non-panel control mode</p> <p>1: Stop according to stop mode in non-panel mode</p> <p>2: E015 free halt in non-panel mode</p> <p>LED tens digit: M-FUNC key function selection</p> <p>0: Ineffective</p> <p>1: Effective in halt status</p> <p>2: Effective in both halt and running</p> <p>LED hundreds digit: Keyboard lock function</p> <p>0: No lock</p> <p>1: All lock</p> <p>2: All lock except for STOP/RESET key</p> <p>3: All lock except for ▶▶ key</p> <p>4: All lock except for RUN and STOP/RESET key</p>	1	000	×
FC.32	Reserved	-	-	0	*

FC.33	Frequency source overlay selection	Digit: Frequency source selection 0: The main frequency source 1: Primary and secondary operation results (the results are determined by the tens digit) 2: The main frequency source switching with the auxiliary frequency source 3: The main frequency source switching with Primary and secondary operation results 4: The auxiliary frequency source switching with Primary and secondary operation results Ten digit: Frequency source & Primary and secondary operation results relationships 0: Main+Auxiliary 1: Main-Auxiliary 2: Maximum value of the two 3: Minimum value of the two 4: Main-Auxiliary 5: (Main*Auxiliary)/F1.06	0	0	○
Additional function parameter FD group					
Fd.00	DO1 output open delay	0.0~600.0	0.1	0	○
Fd.01	DO1 output closed delay	0.0~600.0	0.1	0	○
Fd.02	DO2 output open delay	0.0~600.0	0.1	0	○
Fd.03	DO2 output closed delay	0.0~600.0	0.1	0	○
Fd.04	Relay output open delay	0.0~600.0	0.1	0	○
Fd.05	Relay output closed delay	0.0~600.0	0.1	0	○

Fd.09	Fan start-stop temperature threshold	0~100℃	1	45	○
Monitoring parameter U0 group					
U0.00	Output frequency (before compensation)	-	-	-	*
U0.01	Output torque	-	-	-	*
U0.02	Setting frequency	-	-	-	*
U0.03	Output frequency (after compensation)	-	-	-	*
U0.04	Bus voltage	-	-	-	*
U0.05	AI1	-	-	-	*
U0.06	AI2	-	-	-	*
U0.07	Analog closed loop feedback	-	-	-	*
U0.08	Analog closed loop setting	-	-	-	*
U0.09	Output power	-	-	-	*
U0.10	Output voltage	-	-	-	*
U0.11	Output current	-	-	-	*
U0.12	Running rotate speed	-	-	-	*
U0.13	Setting rotate speed	-	-	-	*
U0.14	Running line speed	-	-	-	*
U0.15	Setting line speed	-	-	-	*

U0.16	External count value	-	-	-	*
U0.17	Terminal status	-	-	-	*
U0.18	Actual length	-	-	-	*
U0.19	Setting length	-	-	-	*
U0.20	Reserved	-	-	-	*
U0.21	Inverter rated capacity	-	-	-	*
U0.22	Inverter rated voltage	-	-	-	*
U0.23	Inverter rated current	-	-	-	*
U0.24	Reserved	-	-	-	*
U0.25	IGBT temperature	-	-	-	*
U0.26	First failure type		1	0	*
U0.27	Second failure type		1	0	*
U0.28	Third failure type		1	0	*
U0.29	Bus voltage during last failure	0~999V	1V	0V	*
U0.30	Output current during last failure	0.00~99.99A	0.01A	0.00A	*
U0.31	Output frequency during last failure	0.00Hz~550.00Hz	0.01Hz	0.00Hz	*
U0.32	IGBT temperature during last failure	0.0~100.0℃	0.1	0℃	*

U0.33	Bus voltage during second failure	0~999V	1V	0V	*
U0.34	Output current during second failure	0.00~99.99A	0.01A	0.00A	*
U0.35	Output frequency during second failure	0.00Hz~550.00Hz	0.01Hz	0.00Hz	*
U0.36	IGBT temperature during second failure	0.0~100.0℃	0.1	0℃	*
U0.37	Accumulated running time	-	-	-	*
U0.38	Software version	-	-	-	*

The fault code table

Fault code	Fault type	Fault code	Fault type
E001	Frequency inverter Accelerating running of the current	E016	485 communication fault
E002	Frequency inverter decelerating running of the current	E017	Fault of current detection circuit
E003	Frequency inverter constant running of the current	E018	Self-tuning bad
E004	Frequency inverter Accelerating running of the voltage	E019	EEPROM read&write fault
E005	Frequency inverter decelerating running of the voltage	E020	Closed-loop feedback loss
E006	Frequency inverter constant running of the voltage	E021	Reserved
E007	Reserved	E022	Reserved
E008	Motor overload	E023	Operation panel parameter copy fault
E009	Frequency inverter overload	E024	Reserved
E010	Power module protection	E025	Reserved
E011	Input missing phase	E026	Buffer anomaly
E012	Output missing phase	E027	Analog input AI1 fault
E013	The inverter radiator is overheating	E028	Analog input AI2 fault
E014	The rectification module radiator is overheating	E029	The wave limit flow timeout protection
E015	External fault		

Chapter 5 Fault Countermeasures and Abnormality Handling

5.1 Fault Phenomena and Countermeasures

When the inverter is abnormal, LED digit tube will display corresponding fault codes and its contents, the inverter will stop outputting, when a fault occurs, if the motor is rotating, it will park freely, till it stops rotating. Fault types of the inverter which may occur are shown in Table 5-1, when the inverter is fault, users should carry out examination according to this table first, and record fault phenomena in details, when technical services are required, please contact the After sale Dept. of our company directly, or contact dealers of the company.

Table 5-1 Fault Alarming Contents and Countermeasures

Fault Code	Fault Type	Possible Fault Reasons	Countermeasures
E001	Inverter accelerating running overcurrent	Accelerating time is too short	Lengthen accelerating time
		V/F curve is not suitable	Adjust V/F curve settings, adjust manual torque lifting, or correctly set motor parameters to guarantee normal torque lifting
		When instant stop occurs, restart is implemented for rotating motors.	The start method F2.00 is set to rotational speed tracking restart function
		Power grid voltage is too low	Check input power supply
		Inverter power is too low	Select the inverter of large power level.
E002	Inverter decelerating running overcurrent	Decelerating time is too short	Lengthen the decelerating time
		There's any potential energy load or load inertia torque is large.	External proper energy consumption braking parts.
		Inverter power is low	Select the inverter of large power level.
E003	Inverter constant-speed running overcurrent	Load changes in a sudden	Reduce sudden change in load
		Accelerating and decelerating time is set too short	Properly lengthen the accelerating and decelerating time
		Load abnormal	Carry out load check.
		Power grid voltage is low	Check input power supply
		Inverter power is low	Select the inverter of large power level

Fault Code	Fault Type	Possible Fault Reasons	Countermeasures
E004	The inverter accelerating running overvoltage	Input voltage abnormal	Check input power supply
		Accelerating time is set too short	Properly lengthen the accelerating time
		When instant stop occurs, implement restart on all rotating motors.	Set start method F2.00 as the rotational speed tracking restart function.
E005	The inverter decelerating running overvoltage	Decelerating time is too short (relative to regenerated energy)	Lengthen the decelerating time
		There's potential load or load inertia torque is large.	Select proper energy consumption braking parts.
E006	inverter constant-speed running overvoltage	Input voltage abnormal	Check input power supply
		Accelerating and decelerating time is set too short.	Properly lengthen the accelerating and decelerating time
		Abnormal change occurred in input voltage.	Install input reactor.
		Load has large inertia.	Consider to adopt energy consumption braking parts.
E007	Reserved	-	-
E008	Motor overload	V/F curve not suitable	Correctly set V/F curve and torque lifting.
		Power grid voltage is too low.	Check power grid voltage
		General motor is under long-term low speed running with huge load.	Special motor could be selected for long-term low speed running.
		Motor overload protection coefficient is set incorrectly.	Correctly set the motor overload protection coefficient
		Motor blocked or sudden change in load is too large.	Check load.
E009	Inverter overload	Accelerating time is too short.	Lengthen the accelerating time
		DC braking amount is too large.	Decrease DC braking current, and lengthen braking time.
		V/F curve is not suitable	Adjust V/F curve and torque lifting
		When instant stop occurs, implement restart on all rotating motors.	Set start method F2.00 as the rotational speed tracking restart function.
		Power grid voltage is too low.	Check power grid voltage
		Load is too large	Select inverter of larger power
E010	Inverter module protection	Instant overcurrent of the inverter	See overcurrent countermeasures
		Output three-phase has interface short circuit Or grounding short circuit.	Re-wiring.
		Tunnel blocked or fan damaged.	Smoothen the tunnel or change the fan.

Fault Code	Fault Type	Possible Fault Reasons	Countermeasures
		Ambient temperature is too high.	Reduce ambient temperature.
		Control panel wiring or inserts are loose.	Check and connect again.
		Current waveform abnormal caused by reasons such as output phase fault etc.	Check wiring.
		Auxiliary power supply is damaged, and driving voltage is undervoltage.	Seek for services
		Inverter module shoot-through	Seek for services
		Control panel abnormal	Seek for services
E011	Phase fault on input side	Phase fault for input R, S and T	Check installation assembling line Check input voltage
E012	Phase fault on output side	Phase fault for output U, V and W	Check output wiring Check motor and cable
E013	Inverter module radiator overheated	Ambient temperature is too high	Reduce ambient temperature
		Tunnel is blocked	Clean the tunnel
		Fan is damaged	Change the fan
		Inverter module is abnormal	Seek for services
E014	Rectification module radiator overheated	Ambient temperature is too high	Reduce ambient temperature
		Tunnel is blocked	Clean the tunnel
		Fan is damaged	Change the fan
E015	Emergency parking or external device fault	In non-operation panel mode, use emergency STOP/RESET key.	View function definition of STOP/RESET key in FC.31.
		Use the STOP/RESET key under stall situation.	View function definition of STOP/RESET key in FC.31.
		If the stall state maintains for 1 minute, it will report E015 automatically and shut down.	Correctly set FA.04 and FA.05.
		External fault emergency stop terminal closed	After handling external fault, external fault terminal will be disconnected.
E016	485 communication error	Baud rate setting improper	Set the baud rate properly.
		Serial port communication error	Press the STOP/RESET key to reset, and seek for services
		Fault alarming parameter setting improper	Modify the settings of Fb.04, Fb.03 and FA.15.
		Upper computer does not work	Check whether the upper computer works or not, and whether the wiring is correct or not.

Fault Code	Fault Type	Possible Fault Reasons	Countermeasures
E017	Current detection circuit fault	Control panel wiring or inserts are loose.	Check and connect again.
		Auxiliary power supply is damaged.	Seek for services
		Hall devices are damaged.	Seek for services
		Amplification circuit is abnormal.	Seek for services
E018	Automatic tuning unsound	Motor nameplate's parameter setting error	Correctly set parameters according to motor nameplate.
		Automatic tuning timeout	Check motor wiring.
E019	EEPROM read/write fault	R/W of control parameters is error.	STOP/RESET key reset Seek for services
E020	Reserved	-	-
E021	Reserved	-	-
E022	Reserved	-	-
E023	Operation panel parameters copy error	Operation panel parameters incomplete or operation panel version is inconsistent with the main control panel version.	Refresh operation panel data and version, use F0.03=1 to upload parameters first, and then use F0.03=2 or 3 to download.
		Operation panel EEPROM is damaged.	Seek for services
E024	System interference	Severe interference	Press STOP/RESET key to reset or add a power supply filter outside the power supply.
		Main control panel DSP R/W error.	Press the STOP/RESET key to reset, and seek for services.
E025	Control power supply overvoltage	Input voltage abnormal	Check input power supply or seek for services.
E026	Buffer circuit abnormal	Power grid voltage is too low.	Check power grid voltage
		Thruster is damaged	Change the major loop contactor, and seek for services.
		Power on buffer resistance is damaged	Change the buffer resistance, and seek for services.
		The control loop is damaged	Seek for services
		Input phase fault	Check input R, S and T wiring.

5.2 Operation Abnormalities and Countermeasures

The following abnormalities may occur during the usage, refer to Table 5-2 countermeasures to deal with:

Table 5-2 Operation Abnormalities and Countermeasures

Phenomena	Occurrence Conditions	Possible Reasons	Countermeasures
Operation panel does not respond	Individual keys or all keys do not respond.	Operation panel locking function validates.	Power on of the inverter after complete power off.
		Cable contact of the operation panel is unsound.	Check the connecting cable.
		Operation panel keys are damaged.	Change the operation panel or seek for services.
function code cannot be modified	Unable to be modified under running state.	This function code cannot be modified under running state.	Modify under shutdown state.
	Part of function codes cannot be modified.	Function code F0.00 is set to 1 or 2.	Set F0.00 to 0.
		This function code is actual detection value.	Users cannot change actual parameters.
	Press M-F there's no reaction.	Operation panel locking function validates or others.	See solutions to "No response on operation panel".
	Press M-F system cannot enter, function code display 0.0.0.0.	There's a user password	Correctly input user password
			Seek for services
Unexpected Inverter Shutdown during Running	There's no shutdown command, the inverter shuts down automatically, and running	There's a fault alarm.	Find fault reasons, and reset fault.
		A simple PLC single cycle is completed.	Check PLC parameter settings.
		Fixed length shutdown function validates.	Clear actual length or set FC.14 (Set length) to 0.

Phenomena	Occurrence Conditions	Possible Reasons	Countermeasures
	indicator turns off.	Upper computer or remote control box disconnects from the inverter communication.	Check communication line and Fb.04, Fb.03 and FA.15 settings.
		Power supply is interrupted.	Check power supply situation.
		Running command channel shifting.	Check operation and settings related to running command channel.
		Control terminal positive/negative logic change.	Check whether F6.23 settings comply with requirements.
	No shutdown command is given, motor shuts down automatically, inverter running indicator turns on, and runs at zero frequency.	Fault automatic reset	Check fault automatic reset settings and fault reasons.
		Simple PLC pause	Check PLC pause function terminal.
		External interruption	Check external interruption settings and fault sources.
		Zero frequency shutdown	Check zero frequency shutdown parameter settings FC.12 and FC.13.
		Set frequency is 0.	Check the set frequency
		Jump frequency setting problems.	Check the jump frequency settings.
		Positive action, closed-loop feedback>given Negative action, closed-loop feedback<given	Check closed-loop given and feedback.
		Frequency adjustment set to 0.	Check FC.2 and FC.30 settings.
		Select instant low voltage compensation during power off restart, and power supply voltage is low.	Check power off restart function settings and input voltage.

Phenomena	Occurrence Conditions	Possible Reasons	Countermeasures
Inverter can not run	Press the run key, the inverter would not run, and running indicator is off.	Free parking function terminal is valid.	Check the free parking terminal.
		Inverter forbid the running terminal is valid.	Check the inverter to forbid the running terminal.
		External shutdown function terminal is valid.	Check external shutdown function terminal.
		Fixed length shutdown	Check the fixed length shutdown setting or clear the actual length.
		In three-line control mode, the three-line rotating control function terminal is not closed.	Set and close the three-line rotating control terminal.
		There's a fault alarm.	Troubleshooting
		Upper computer's virtual terminal function is set improperly.	Cancel the upper computer virtual terminal function or use the upper computer to give proper settings, or modify the F6.23 settings.
		The input terminal positive/negative logic settings are improper.	Check the F6.23 settings.
Inverter powers on and runs immediately to report P.OFF	Thyristor or contactor disconnects and inverter load is too large.	For thyristor or contactor is not closed, when the inverter load is relatively large, the main loop DC bus voltage will decrease during running, and the inverter will display P.OFF first, rather than the E026 fault.	Run the inverter again after waiting the thyristor or the contactor closed completely.



Note:

- (1) Before reset, it is required to check fault reasons completely and carry out troubleshooting, otherwise it may cause permanent damages to the inverter.
- (2) If any fault occurs again because of unable to reset or after reset, check reasons, while continuous resets may damage the inverter.
- (3) Overload, it is required to delay for 5 minutes to reset during overheat protection.

Chapter 6 Maintenance

6.1 Maintenance

In case of change of service environment for inverter, such as temperature, humidity, smog and aging of inverter internal parts, the inverter fault may occur. Therefore, the inverter must be examined daily and given the regular maintenance in period of storing and using.

6.1.1 Daily maintenance

When the inverter is turned on normally, please make sure the following items:

- (1) Whether the motor has abnormal noise and vibration.
- (2) Whether inverter and motor heat or occur abnormality.
- (3) Whether environment temperature is too high.
- (4) Whether the value of load ammeter is in conformity with the former.
- (5) Whether the fan of inverter rotates normally.

6.2 Regular maintenance

6.2.1 Regular maintenance

Before the inverter is maintained and checked, the power supply must be cut off, in addition, the monitor shall have no display and main circuit power indicator lamp goes out. The examined content is shown as table 6-1.

Table 6-1 Regular examined contents

Item	Content	Solution
Screw of main circuit terminal and control circuit terminal	Whether the screw is slack	Tightened by screwdriver
Heat sink	Whether there is dust on it	Blow it away with the dry compressed air of 4-6kg/cm ² Pressure
PCB(printed circuit board)	Whether there is dust or vapor on it	Clean the surface of PCB board
Fan	Whether it runs normally and makes abnormal sound or vibration ,and whether the accumulated time runs up to more than 20000 hours	Change the fan
Power unit	Whether there is dust on it	Clear the foreign matter
Aluminum electrolytic capacitor	Whether it has color change,peculiar smell,bubbling,liquid leakage	Changed Aluminum electrolytic capacitor

6.2.2 Regular maintenance

In order to make the inverter run normally for a long time, the electronic elements mounted in inverter shall be maintained regularly. And the service life of electronic elements is different with the service environment and service condition. The maintenance period of inverter as shown in the table 6-2 is provided for referring.

Table 6-2 Changing time of inverter parts

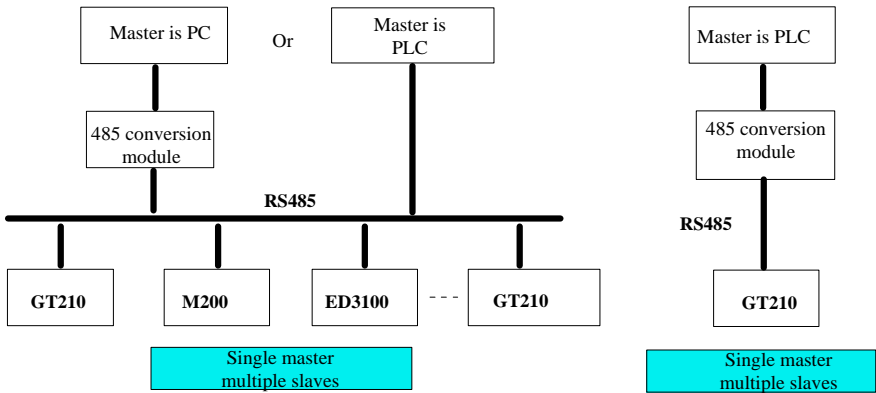
Part name	Standard changing time
Fan	2~3 years
Electrolytic capacitor	4~5 years
PCB	5~8 years
Fuse	10 years

Applicable condition for changing time of aforementioned inverter parts

- (1) Environment temperature: Annual average is 30℃.
- (2) Load factor: Less than 80%
- (3) Running time: Less than 12 hours every day

Annex Communication Protocol

Networking Method



Inverter Networking Diagram

Interfacing method

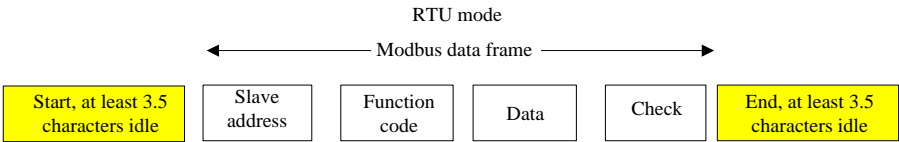
RS485: Asynchronous, half duplex Default: 8-N-2, 9600bps. See group FB description for parameter settings.

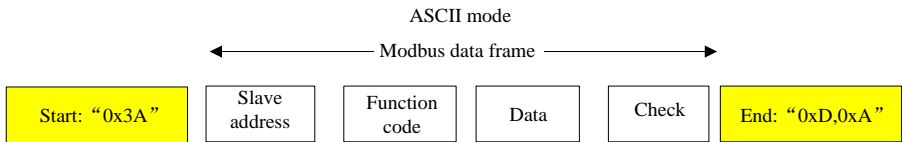
Communication method

1. Communication protocol of the inverter is the Modbus protocol, except for supporting common register read and write, partial commands are also expanded to carry out management on inverter function codes.
2. The inverter is the slave, master-slave point to point communication. When the master sends commands using broadcast address, the slave will not respond.
3. During multi-machine communication or long distance communication, connecting a resistance of 120Ω at both ends of the communication could improve the communication's interference rejection.

Protocol format

Modbus protocol supports both RTU mode and ASCII mode, and corresponding frame format is as follows:





Modbus adopts the "Big Endian" coding method, which sends high bit bytes first, and then low bit bytes.

RTU method: Under RTU method, idle time between frames could select function code setting or observe inner conventions of Modbus. Min. frame idle agreed inside Modbus is as follows: Frame head and end use bus idle time larger than or equal to 3.5 bytes to determine the frame. Data check adopts CRC-16, and the entire information participates in check, while high and low bits of checksum need to be sent after exchange. For detailed CRC check, please refer to examples in the protocol. It is to be noted that, at least 3.5 characters of bus idle should be kept between frames (or min. bus idle time should be set), while bus idle between frames need not to accumulate start and end idles.

The following is data frame requested for reading parameter 002 of machine 1:

Add ress	Function Code	Register Address		Read Characters		Checksum	
0x01	0x03	0x00	0x02	0x00	0x01	0x25	0xCA

The following is response frame of machine 1:

Add ress	Function Code	Response Bytes	Register Content		Checksum	
0x01	0x03	0x02	0x13	0x88	0xB5	0x12

Under ASCII, the frame head is "0x3A", and the frame end is "0x0D" and "0x0A" by fault, while the frame end could also be set by users. Under ASCII, except for frame head and frame end, other data bytes could all be sent in the form of ASCII code, which are sent to the high 4-bit bytes first, and then to low 4-bit bytes. Under ASCII, the data has a 7-bit length. As for "A"~"F", ASCII of capitalized letters of it are adopted. In this case, data adopts LRC check, which covers information part from slave address to data. Checksum is equal to the supplementary code of character sum (abandoning carry bits) of all data participating in check.

An example of Modbus data frame of ASCII is as follows:

Write 4000 (0xFA0) into the inner register 002 of slave 1, the format of command frame is shown in the following table:

LRC check=supplementary code of (01+06+00+02+0x0F+0xA0)=0x48

	Frame Head	Address		Function Code		Register Address				Write Content				LRC Check		Frame End	
Character	:	0	1	0	6	0	0	0	2	0	F	A	0	4	8	CR	LF
ASCII	3A	30	31	30	36	30	30	30	32	30	46	41	30	34	38	0D	0A

The inverter, via function code, could set different response delays to adapt to detailed application needs of various master station, for RTU mode, actual response delay is not less than an interval of 3.5 characters, for ASCII mode, actual response delay is not less than 1ms.

Protocol function

The most important function of Modbus is to read and write parameters, and different function codes decide different operation requests. Inverter Modbus protocol supports the following function code operations:

Function Code	Function Code Significance
0x03	Read inverter function code parameters and run state parameters.
0x06	Modify single inverter function code or control parameter, and do not save after power off.
0x08	Wire diagnosis
0x10	Modify multiple inverter function codes or control parameters, and do not save after power off.
0x41	Modify single inverter function code or control parameter, and do not save after power off.
0x42	Function code management

Inverter's function code parameters, control parameters and state parameters are all mapped to Modbus read/write register. Read/Write characteristics and range of function code parameters all comply with instructions in the inverter's user manual. Inverter function code's group number is mapped to high byte address of the register, while group index is mapped to low byte address of the register. Inverter's control parameters are virtualized to inverter function code group 50, while inverter's state parameters are virtualized to inverter function code group 51. The correspondence between function code group number and its mapped register address high byte is as follows:

Group F0: 0x00; group F1: 0x01; group F2: 0x02; group F3: 0x03; group F4: 0x04; group F5: 0x05; group F6: 0x06; group F7: 0x07; group F8: 0x08; group F9: 0x09; group FA: 0x0A; group Fb: 0x0B; group FC: 0x0C; group Fd: 0x0D; group FE: 0x0E; inverter control parameter group: 0x32; inverter state parameter group: 0x33.

For example, register address of inverter function code parameter F3.02 is F3.02, and register address of inverter function code parameter FE.01 is 0xE01.

The overall data frame's format has been introduced in the above, format and significance of Modbus protocol's function code and data part will be introduced in the following, which is the content of "function code" and "data" parts in the above mentioned data frame format.

These two parts form the application protocol data unit of Modbus, and the application protocol data unit in the following refers to these two parts. Description on frame format in the following takes RTU mode as an example, and ASCII mode application layer protocol data unit's length needs to be doubled.

Read inverter parameters' application layer protocol data unit as follows:

Request format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function code	1	0x03
Start register address	2	0x0000~0xFFFF
Register number	2	0x0001~0x0004

Response format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function code	1	0x03
Read bytes	1	2* Register number
Read contents	2* Register number	

If operation request fails, response should be error codes and abnormal codes. Error code is equal to (function code+0x80), and abnormal code indicates error reasons. Abnormal codes are listed as follows:

Abnormal Code	Abnormal Code Significance
0x1	Illegal function code.
0x2	Illegal register address.
0x3	Data error, data exceeds upper limit or lower limit.
0x4	Slave operation fails (including data within the range of upper limit and lower limit, but errors caused by invalid data)
0x5	Command valid, under transaction, mainly used in storing data to non-volatile storage.
0x6	Slave is busy, please try later, mainly used in storing data to non-volatile storage.
0x18	Information frame error: Including information length error and check error.
0x20	Parameter unable to be modified.
0x22	Parameters are protected by password.

Modify single inverter parameter's application layer protocol data unit, as follows:

Request format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function Code	1	0x06
Register Address	2	0x0000~0xFFFF
Register Content	2	0x0000~0xFFFF

Response format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function Code	1	0x06
Register Address	2	0x0000~0xFFFF
Register Content	2	0x0000~0xFFFF

If operation request fails, response should be error code and abnormal code. Error code is equal to (function code+0x80), and see the above description for any abnormal code.

Application layer protocol data unit of wire diagnosis is as follows:

Request format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function Code	1	0x08
Sub Function Code	2	0x0000~0x0030
Data	2	0x0000~0xFFFF

Response format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function Code	1	0x08
Sub Function Code	2	0x0000~0x0030
Data	2	0x0000~0xFFFF

If operation request fails, response should be error code and unexpected code. Error code is 88H, and see the above description for any abnormal code.

Sub functions supported by wire diagnosis are listed as follows:

Sub Function Code	Data (Request)	Data (Response)	Sub Function Significance
0x0001	0x0000	0x0000	Re-initialize communication: Make no-response mode failure.

	0xFF00	0xFF00	Re-initialize communication: Make no-response mode failure.
0x0003	“New frame end” and “00” occupy high and low bytes respectively.	“New frame end” and “00” occupy high and low bytes respectively.	Set frame end of ASCII mode, and this “new frame end” will replace the old line feeds (Note: The new frame end cannot be larger than 0x7F, and cannot be equal to 0x3A).
0x0004	0x0000	No response	Set the no response mode, and the slave only responds to “re-initialize communication request” from here. It is mainly used to isolate fault slave.
0x0030	0x0000	0x0000	Set slave “never respond” invalid command and error command.
	0x0001	0x0001	Set slave “respond” invalid command and error command.

Modify multiple inverter function codes and state parameters’ application layer protocol data unit, as follows:

Request format is as follows:

Application Layer Protocol Data Unit	Data Length (Bytes)	Value or Range
Function Code	1	0x10
Start Register Address	2	0x0000~0xFFFF
Operation Register Number	2	0x0001~0x0004
Register Content Bytes	1	2*Operation register number
Register Content	2*Operation register number	

Response format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function Code	1	0x10
Start Register Address	2	0x0000~0xFFFF
Operation Register Number	2	0x0001~0x0004

This request modifies the contents of continuous data units from start register address. The mapping of register address is the inverter’s function code parameters and control parameters etc., for detailed mapping relationship, see the mapping relationship definition of

register address in the following. If operation request fails, abnormal response is shown in the above.

When storing multiple register parameters continuously, the inverter starts storing from the register at the lowest address, till the one at the highest address, and the storage may success completely or return from the address failing first.

Function code 0x41 is used to modify individual inverter function code or control parameter, and store it to the non-volatile storage unit. Its command format is similar to 0x06, and the only difference lies in that parameters operated by command 0x06 will not be saved after power off, while parameters operated by 0x41 will be saved after power off. Some control parameters in the inverter cannot be saved into the non-volatile storage unit, as for these parameters, function codes 0x41 and 0x06 have the same operation effects, and these parameters will be introduced in the following.

The management of inverter function codes includes reading upper limit and lower limit of parameters, reading parameter characteristics, reading function code menu's max. group index, reading the next function code group number and the previous function code group number, reading the current display state parameter index as well as displaying the next state parameter etc. Parameter characteristics include information such as parameter readability and writability, parameter unit as well as scaling relation etc. These commands are used to remotely modify inverter function code parameters. Application layer protocol data units managed by function codes are as follows:

Request format is as follows:

Application Layer Protocol Data Unit	Data Length(Bytes)	Value or Range
Function Code	1	0x42
Sub Function Code	2	0x0000~0x0007
Data	2	Detailed range should be decided according to the inverter's type.

Response format is as follows:

Application Layer ProtocolData Unit	Data Length (Bytes)	Value or Range
Function Code	1	0x42
Sub Function Code	2	0x0000~0x0007
Data	2	0x0000~0xFFFF

If operation request fails, response should be error code and abnormal code. If operation fails, carry out abnormal response, and see the above description for any abnormal response code.

Sub functions managed and supported by function codes are listed in the following:

Sub Function Code	Data (Request)	Data (Response)	Sub Function Significance
0x0000	Function code group number and group index occupy high and low bytes respectively.	The upper limit of function code parameter.	Read the upper limit of function code parameter.
0x0001	Function code group number and group index occupy high and low bytes respectively.	The lower limit of function code parameter.	Read the lower limit of function code parameter.
0x0002	Function code group number and group index occupy high and low bytes respectively.	Function code parameter characteristics, for details, see the description in the following.	Read characteristics of function code parameter.
0x0003	Function code group number occupies high byte, and low byte is "00".	Max. value of group index.	Read the max. value of group index.
0x0004	Function code group number occupies high byte, and low byte is "00".	The next function code group number occupies high byte, and low byte is "00".	Read the next function code group number.
0x0005	Function code group number occupies high byte, and low byte is "00".	The previous function code group number occupies high byte, and low byte is "00".	Read the previous function code group number.
0x0006	0x3300	Currently displayed state parameter index	Read the currently displayed state parameter index
0x0007	0x3300	The next state parameter index	Display the next state parameter.

State parameter group cannot be modified, and reading upper limit and lower limit operation is not supported.

Function code parameter is featured as a 2-byte length, and bit definition is as follows:

Featured Parameter (BIT)	Value	Significance
BIT2~BIT0	000B	No decimal part
	010B	1 decimal
	011B	2 decimals
	100	3 decimals
	Others	Reserved
BIT3	Reserved	

Featured Parameter (BIT)	Value	Significance
BIT5~BIT4	00B	Modify step length to 1
	Others	Reserved
BIT7~BIT6	01B	Able to be modified.
	10B	Unable to be modified during running
	11B	Factory set, and users cannot modify.
	00B	Actual parameter, unable to be modified.
BIT11~BIT8	0000B	No unit
	0001B	Unit is HZ
	0010B	Unit is A
	0011B	Unit is V
	0100B	Unit is r/min
	0101B	Unit is linear speed (m/s)
	0110B	Unit is percentage (%)
	Others	Reserved
BIT12	1	Modify the upper limit according to 4-bit byte restriction.
	0	Modify the upper limit according to character restriction.
BIT15~BIT13	Reserved	

The inverter control parameters could complete inverter start, stop, and set running frequency etc., via retrieving the inverter's state parameters, it could obtain the inverter's running frequency, output current, output torque etc. Specific inverter's control parameters and state parameters are listed in the following:

Inverter's Control Parameter Index

Register Address	Parameter Name	Whether Save after Power off
0x3200	Control command Character	No
0x3201	Main setting	Main setting value is the running frequency given.
0x3202	Running frequency setting	Yes
0x3203	Digit closed-loop given	Yes
0x3204	Pulse closed-loop given	Yes
0x3205	Analog output A01 setting	No
0x3206	Analog output AO2 setting	No
0x3207	Digit output DO setting	No

0x3208	Frequency proportion setting	No
0x3209	Virtual terminal control setting	No
0x320A	Set accelerating time 1	Yes
0x320B	Set decelerating time 1	Yes

Inverter's State Parameter Index

Register Address	Parameter Name
0x3300	Operation state character 1
0x3301	Actual operation value of the current main setting
0x3302	Slave model
0x3303	Inverter model
0x3304	Software version
0x3305	Current running frequency
0x3306	Output Current
0x3307	Output Voltage
0x3308	Output Power
0x3309	Running rotational speed
0x330A	Running linear speed
0x330B	Analog closed-loop feedback
0x330C	Bus voltage
0x330D	External counter
0x330E	Output torque
0x330F	Switching value input/output terminal state: BIT0~15=X1~X8,Y1,Y2,TC,FAN,BRAKE,FWD,REV
0x3310	Actual length
0x3311	Running frequency after compensation
0x3312	The first running fault
0x3313	The second running fault
0x3314	The third (the latest) running fault
0x3315	Running frequency setting
0x3316	Running rotational speed setting
0x3317	Analog closed-loop given
0x3318	Linear speed setting
0x3319	All

0x331A	AI2
0x331B	Set length
0x331C	Set accelerating time 1
0x331D	Set decelerating time 1
0x331E	Running command given channels: 0: Panel control 1: Terminal control 2: Serial port control
0x331F	Inverter state character 2
0x3320	Frequency given channels: 0: Digit given 1, keyboard ▲▼ adjustment 1: Digit given 2: Terminal UP/DN adjustment 2: Digit given 3: Serial Port 3: AI1 Analog Given 4: AI2 Analog Given 5: Terminal PULSE given 6: Panel analog given
0x3321	Accumulated length

Inverter's control bits are defined as follows:

Control Words (Bits)	Value	Significance	Function Description
BIT2, 1, 0	111B	Running command	Start the inverter
	110B	Method 0 parking	Park according to the set decelerating time
	101B	Method 1 parking	Park freely
	011B	Method 2 parking	The fastest decelerating time parking.
	100B	External fault parking	Park freely, and the inverter displays an external fault.
	Others	No command	
BIT3	1	Reversal	Rotational direction when the running command is set valid (invalid for Jog commands)
	0	Forward rotating	
BIT4	1	Jog forward rotating	
	0	Jog forward rotating invalid	

BIT5	1	Jog reversal	
	0	Jog reversal invalid	
BIT6	1	Allow accelerating and decelerating	Reserved
	0	Prohibit accelerating and decelerating	
BIT7	1	Upper computer control valid	Control word distributed by the current upper computer valid.
	0	Upper computer control invalid	Control word distributed by the current upper computer invalid.
BIT8	1	Main setting valid	
	0	Main setting invalid	
BIT9	1	Fault reset valid	
	0	Fault reset invalid	
BIT15~10	000000B	Reserved	

Note: For Jog running givens (BIT4, BIT5), they could not be valid together with control words BIT0~BIT2!

Bit definition of the inverter's state word 1 is as follows:

State Word (Bit)	Value	Significance	Remarks
BIT0	1	Inverter running	
	0	Inverter shutdown	
BIT1	1	Inverter reversal	
	0	Inverter forward rotating	
BIT2	1	Reach main setting	
	0	Do not reach main setting	
BIT3	1	Allow communication control	
	0	Forbid communication control	
BIT7~4	0000B	Reserved	

BIT15~8	00~ 0xFF	Fault code	0: Indicates the inverter is normal; Non-0: Indicates there's a fault, and for the significance of specific fault code, please refer to the user manual for inverter of related type. For example, the fault code of motor overload E014 is 0x0E, while undervoltage is 0x1F.
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Bit definition of the inverter's state word 2 is as follows:

State Word (Bit)	Value	Significance
BIT0	1	Jog running
	0	Non-Jog running
BIT1	1	Closed-loop running
	0	Non-closed-loop running
BIT2	1	PLC running
	0	Non-PLC running
BIT3	1	Multi-band frequency running
	0	Non-multi-band frequency running
BIT4	1	Normal running
	0	Abnormal running
BIT5	1	Swing frequency
	0	Non-swing frequency
BIT6	1	Undervoltage
	0	Normal voltage
Others		Reserved

Notes:

1. For data frames of ASCII format, if the frame length is an even, this frame will be discarded.
2. External inverter cannot communicate under restoring to default parameters and parameter identification stage, and communication will return to normal after completion.

3. Internal parameters of the inverter F3.09, F0.03 and F0.04 cannot be modified via communication settings, and communication cannot modify F0.04, but user password could be verified via writing F0.04.

4. When multiple multifunction input terminal functions are set the same, it will cause function disorders, and it is required to avoid such situation when users modify multifunctional terminal function via MODBUS protocol.

CRC Check

Considering the need to improve speed, CRC-16 is usually realized by adopting the form of table, and the following is the C language source code to realize CRC-16, note that high-low bytes have been exchanged in the final result, which means the result is the CRC checksum to be sent.

```

unsigned short CRC16 ( unsigned char          /* The function returns the CRC as a
*msg, unsigned char length)                unsigned short type */
{

    unsigned char uchCRCHi = 0xFF ;          /* high byte of CRC initialized */
    unsigned char uchCRCLo = 0xFF ;          /* low byte of CRC initialized */
    unsigned uIndex ;                        /* index into CRC lookup table */
    while (length--)                         /* pass through message buffer */
    {
        uIndex = uchCRCLo ^                 /* calculate the CRC */
        *msg++ ;
        uchCRCLo = uchCRCHi ^
        (crcvalue[uIndex] >>8);
        uchCRCHi
        =crcvalue[uIndex]&0xff;
    }
    return (uchCRCHi |
    uchCRCLo<<8) ;
}

/* Table of CRC values */

const unsigned int  crcvalue[ ] = {
0x0000,0xC1C0,0x81C1,0x4001,0x01C3,0xC003,0x8002,0x41C2,0x01C6,0xC006,0x8
007,0x41C7,
0x0005,0xC1C5,0x81C4,0x4004,0x01CC,0xC00C,0x800D,0x41CD,0x000F,0xC1CF,0x
81CE,0x400E,
0x000A,0xC1CA,0x81CB,0x400B,0x01C9,0xC009,0x8008,0x41C8,0x01D8,0xC018,0x
8019,0x41D9,

```

0x001B,0xC1DB,0x81DA,0x401A,0x001E,0xC1DE,0x81DF,0x401F,0x01DD,0xC01D,
 0x801C,0x41DC,
 0x0014,0xC1D4,0x81D5,0x4015,0x01D7,0xC017,0x8016,0x41D6,0x01D2,0xC012,0x8
 013,0x41D3,
 0x0011,0xC1D1,0x81D0,0x4010,0x01F0,0xC030,0x8031,0x41F1,0x0033,0xC1F3,0x81
 F2,0x4032,
 0x0036,0xC1F6,0x81F7,0x4037,0x01F5,0xC035,0x8034,0x41F4,0x003C,0xC1FC,0x81
 FD,0x403D,
 0x01FF,0xC03F,0x803E,0x41FE,0x01FA,0xC03A,0x803B,0x41FB,0x0039,0xC1F9,0x
 81F8,0x4038,
 0x0028,0xC1E8,0x81E9,0x4029,0x01EB,0xC02B,0x802A,0x41EA,0x01EE,0xC02E,0x
 802F,0x41EF,
 0x002D,0xC1ED,0x81EC,0x402C,0x01E4,0xC024,0x8025,0x41E5,0x0027,0xC1E7,0x
 81E6,0x4026,
 0x0022,0xC1E2,0x81E3,0x4023,0x01E1,0xC021,0x8020,0x41E0,0x01A0,0xC060,0x80
 61,0x41A1,
 0x0063,0xC1A3,0x81A2,0x4062,0x0066,0xC1A6,0x81A7,0x4067,0x01A5,0xC065,0x8
 064,0x41A4,
 0x006C,0xC1AC,0x81AD,0x406D,0x01AF,0xC06F,0x806E,0x41AE,0x01AA,0xC06A,
 0x806B,0x41AB,
 0x0069,0xC1A9,0x81A8,0x4068,0x0078,0xC1B8,0x81B9,0x4079,0x01BB,0xC07B,0x8
 07A,0x41BA,
 0x01BE,0xC07E,0x807F,0x41BF,0x007D,0xC1BD,0x81BC,0x407C,0x01B4,0xC074,0
 x8075,0x41B5,
 0x0077,0xC1B7,0x81B6,0x4076,0x0072,0xC1B2,0x81B3,0x4073,0x01B1,0xC071,0x8
 070,0x41B0,
 0x0050,0xC190,0x8191,0x4051,0x0193,0xC053,0x8052,0x4192,0x0196,0xC056,0x805
 7,0x4197,
 0x0055,0xC195,0x8194,0x4054,0x019C,0xC05C,0x805D,0x419D,0x005F,0xC19F,0x8
 19E,0x405E,
 0x005A,0xC19A,0x819B,0x405B,0x0199,0xC059,0x8058,0x4198,0x0188,0xC048,0x80
 49,0x4189,
 0x004B,0xC18B,0x818A,0x404A,0x004E,0xC18E,0x818F,0x404F,0x018D,0xC04D,0x
 804C,0x418C,
 0x0044,0xC184,0x8185,0x4045,0x0187,0xC047,0x8046,0x4186,0x0182,0xC042,0x804
 3,0x4183,
 0x0041,0xC181,0x8180,0x4040}

If CRC checksum of each sending byte is calculated online, it will take a long time, but could save program space occupied by tables.CRC codes to be calculated on line are as follows:

```

unsigned int crc_check(unsigned char *data,unsigned char length)
{
    int i;
    unsigned crc_result=0xffff;
    while(length--)
    {
        crc_result^=*data++;
        for(i=0;i<8;i++)
        {
            if(crc_result&0x01)
                crc_result=(crc_result>>1)^0xa001;
            else
                crc_result=crc_result>>1;
        }
    }
    return (crc_result=((crc_result&0xff)<<8)|(crc_result>>8));
}

```

Application examples

The command to start 1#inverter for forward rotating, and to set the rotational speed at 50.00HZ (which is 5000 internally) is as follows:

	Address	Function Code	Register Address	Register Number	Register Content Bytes	Register Content	Checksum
Request	0x01	0x10	0x3200	0x0002	0x04	0x01C7,0x1388	0x0399
Response	0x01	0x10	0x3200	0x0002	None	None	0x4F70

1#inverter parks at the quickest speed:

Address	Function Code	Register Address	Register Content	Checksum
0x01	0x06	0x3200	0x00C3	0xC723
0x01	0x06	0x3200	0x00C3	0xC723

5#inverter Jog rotates forward:

Address	Function Code	Register Address	Register Content	Checksum
0x05	0x06	0x3200	0x00D0	0x876A
0x05	0x06	0x3200	0x00D0	0x876A

5#inverter Jog stops:

Address	Function Code	Register Address	Register Content	Checksum
0x05	0x06	0x3200	0x00C0	0x86A6
0x05	0x06	0x3200	0x00C0	0x86A6

5# inverter fault resets:

Address	Function Code	Register Address	Register Content	Checksum
0x05	0x06	0x3200	0x0280	0x86C6
0x05	0x06	0x3200	0x0280	0x86C6

Read 4#inverter's running frequency, and inverter response running frequency is 50.00HZ:

Address	Function Code	Register Address	Register Number or Read Bytes	Register Content	Checksum
0x04	0x03	0x3301	0x0001	None	0xDADB
0x04	0x03	None	0x02	0x1388	0x7912

Read 4#inverter's running frequency, and inverter response running frequency is 50.00HZ.

Address	Function Code	Register Address	Register Number or Read Bytes	Register Content	Checksum
0x04	0x03	0x3301	0x0001	None	0xDADB
0x04	0x03	None	0x02	0x1388	0x7912

Modify 5#inverter's accelerating time 1 (which is function code F0.10) is 10.0s, which does not save after power off.

Address	Function Code	Register Address	Register Content	Checksum
0x05	0x06	0x000A	0x0064	0xA9A7
0x05	0x06	0x000A	0x0064	0xA9A7

Read 5#inverter's output current, and inverter response output current is 30.0A.

Address	Function Code	Register Address	Register Number or Read bytes	Register Content	Checksum
0x05	0x03	0x3306	0x0001	None	0x6ACB
0x045	0x03	None	0x02	0x12C	0x49C9

Read 5#inverter's decelerating time (which is F0.11), and inverter response decelerating time is 6.0S.

Address	Function Code	Register Address	Register Number or Read bytes	Register Content	Checksum
0x05	0x03	0x000B	0x0001	None	0xF4C4
0x05	0x03	None	0x02	0x003C	0x4995

Inverter's scaling relationship

A) Frequency's scaling is 1: 100

To make the inverter rotate at 50Hz, the main setting should be 0x1388 (5000).

B) Time's scaling is 1: 10

To make the inverter accelerating time as 30S, the function code should be set to 0x012c (300).

C) Current's scaling is 1: 10

If the inverter's feedback current is 0x012c, current of this inverter is 30A.

D) Output power is an absolute value.

F) Others (i.e. terminal input and output etc.) Please refer to the inverter's user manual.

Warranty Agreement

1. Warranty scope only includes the frequency inverter body.
2. For normal use, the drives fail or be damaged within 18 months, the company is responsible for the warranty; more than 18 months, will charge a reasonable maintenance costs.
3. Warranty period starting time is the date of manufacture.
4. Within 18 months, some maintenance fees should be charged in the following situations:
 - Do not follow the operating manual steps to cause the damage to the inverter.
 - Damaging the inverter because of fires, water, abnormal voltage and etc..
 - Wiring error causes the damage to the drive.
 - Damaging the inverter because of using non-normal functions .
5. Related services fees are according to the actual costs. If the fees are written in the contract , the contract prevails.
6. Please keep this card and show it to the maintenance supporter when the frequency inverter is repaired
7. If the problems happen, please contact directly with the supplier, or with our company.

Inverter warranty

User's Company:	
Address:	
Zip:	Contact:
Phone:	Fax:
Machine series number:	
Power:	Machine series:
Contract Number:	Purchase Date:
Service company:	
Contact:	Phone:
Repairer:	Phone:
Service Date:	
User opinions and reviews: <input type="checkbox"/> Good <input type="checkbox"/> Better <input type="checkbox"/> General <input type="checkbox"/> Poor Other comments: User's Signature: _____ day month year Company re-visit record: _____	

Certificate Of Quality

Checker: _____

This product is approved to leave the
factory after inspection