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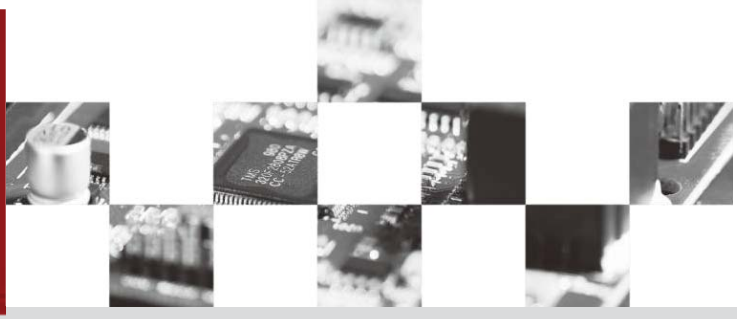


TI260 Series VFD
User Manual

Preface

Thanks for using TI260 series of high-performance vector control variable frequency drive of Thinkvert Technology Limited.

TI260 series VFD is a platform of new generation modular and integrated vector control, using advanced driving control solutions, a unique control method to achieve the integration of asynchronous motor driving, all indicators of the VFD have reached current industry-leading level to meet high performance of the VFD with the trend of perfect anti-tripping control and ability to adapt to harsh, grid temperature, humidity and dust to improve product reliability and on-site adaptability.

This user manual introduced the features, structural characteristics, installation and wiring, parameter functions, troubleshooting, commissioning and maintenance of TI260 Series control VFD in detail. Be sure to read the relevant precautions in this manual carefully before using it; be aware of personal safety when use this equipment.

- Be sure to make the integrity of the shell and all other covers safety and to operate the equipment by following contents of the manual.
- Contents of the user manual will be changed appropriately due to product upgrades, specifications changes and user manuals further improvement.
- The illustrations in this manual are for illustrative purpose only and may differ from the product you ordered.
- If you have problems in using the equipment, please contact with our regional agents, or contact our company's technical service center directly.
- After the product is powered on or in operation, if any abnormality occurs, stop it and check for technical service as soon as possible.
- Technical Services Department Email: service@thinkvert.com

Contents

Chapter 1 Safety and Precautions

1.1 Safety Definition

Danger: Information marked by “Danger” is crucial to avoiding safety accident

Caution: Information marked by “Caution” is needed to avoid damaging the product or other equipment.

NOTICE

Notice: Information marked by “Notice” is helpful to ensure that product is properly operated.

1.2 Motor and Mechanical Load related

Compared with Frequency Operation

TI260 series are voltage type VFD, the output voltage of the VFD is PWM wave, including some harmonic wave. So compared with frequency operation, temperature rising, noise and vibrations are increased slightly when using the motor.

Constant Torque running at low speed

When the VFD drives the ordinary motor running at low speed for a long time, due to the poor heat dissipation effect of the motor, the output torque limit will be lower, if the constant torque remains at low speed operation condition for a long time, we suggest to choose the frequency conversion motor instead.

Motor electronic thermal protection

The VFD can be effectively implemented on the motor thermal protection if the motor is selected properly, but if the power of motor and the VFD can not match, it is a must to adjust the motor protection parameters or other protective measures to ensure the motor is running safely and reliably.

Running over rated frequency of Motor

If the motor exceeds its rated frequency, noise will increase. Need to pay attention to the vibration of the motor, meanwhile, need ensure that the motor bearing and mechanical device can meet the requirements of operating speed range.

Lubrication of mechanical device

Running at low speed for a long time, the reducer and gear need lubricated maintenance regularly, to make sure that transmission effect can meet the needs of the field.

Mechanical resonance point

Setting up the VFD of hopping frequency (F00.10 - F00.15), which can avoid the load device or mechanical resonance point of the motor.

Motor insulation inspection

The motor is for the first time use or reuses after long-term storage, motor insulation test should be done, in order to avoid any damage to the drive motor due to insulation deterioration.

Notice:

A 500V voltage megohmmeter is recommended for the test, the insulation resistance must not be less than 5 MΩ

Negative torque load

To improve the load situations, inverse torque is often happen, VFD often trip caused by overcurrent or overvoltage fault, so the braking components with appropriate parameters should be considered.

1.3 VFD related

Prohibition of installing the capacitor for improving power factor or pressure-sensitive device on the output side of the drive

Because the output of the VFD is PWM wave, so do NOT install the capacitor for improving power factor or pressure-sensitive device on the output side of the drive, otherwise, the drive may suffer transient overcurrent or other devices damaged.

Contactor at output terminal of the VFD

When a contactor is installed between the output side of the drive and the motor, do not turn off the contactor when the drive is active. Otherwise, modules inside the drive will be damaged.

Working Voltage

It is strictly prohibited using TI260 series VFD beyond outside allowable voltage range specified in this manual. Otherwise, the VFD's components may be damaged. If the power voltage is not suitable, please use a corresponding voltage step-up or step-down device to get the proper voltage as required.

Three-phase input changed into Single-phase input

For three-phase input device, it is recommended that users not change it into single-phase input.

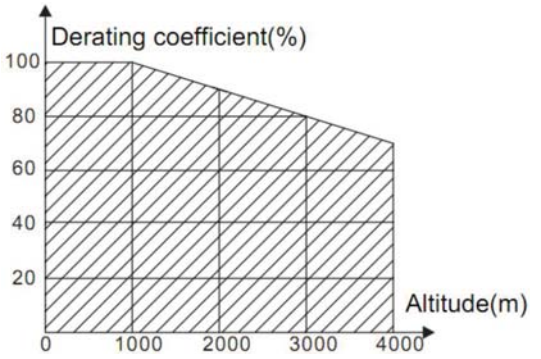
If it is a must to use single phase power, the function of inputting phase protection should be canceled. Bus voltage and current ripple will increase, resulting in poor performance of VFD and reduced capacitor life. Under this situation, the derating should be no more than 60% of the VFD's rated value.

Thunder shock protection

The internal design of the VFD has a lightning overcurrent protection circuit, which has certain self-protection ability to the inductive thunder under the condition of good grounding.

Sea level elevation and Derating

The VFD can output rated power if the installation site below 1000m. The output power decreases if the altitude exceeds 1000 meters. Below is the detailed decreasing range of the derating:

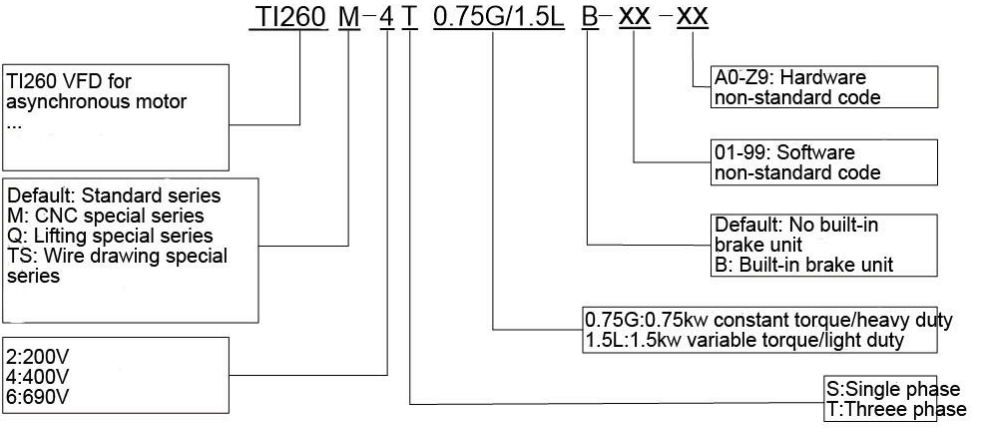


For 3-phase 200V VFDs, the maximum altitude is 3000m above sea level. In altitudes 2000…3000m, the derating is 1% for every 100m.

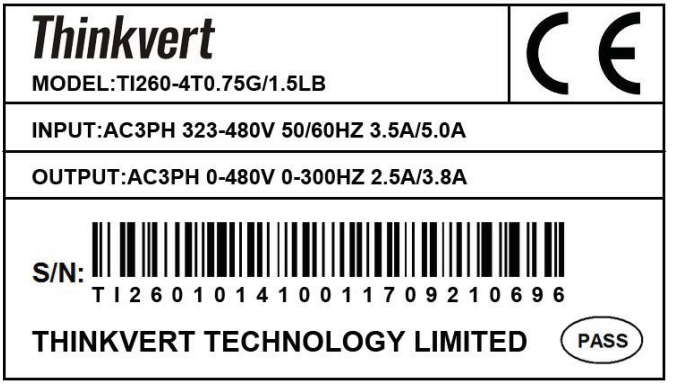
Chapter 2 Product Information

2.1 Model Specification

The nameplate of the inverter type column is combinated by numbers and letters, in which shows the products information such as model series, industry-specific series, power rating, power level, brake unit and version information of hardware and software.



Nameplate Data Information



2.2 Technical Specifications

Electrical specifications	Rated Voltage/ Frequency	Three-phase: 380V, 50/60Hz		
	Allowable Fluctuation	Voltage: -20%～+20%,Imbalance rate＜3% Frequency: ±5% (Non - standard customized)		
	Output Voltage	0~Rated Input		
	Output Frequency	0.00Hz～300.00Hz		
Control feature	Control Mode	Simple Vector control	Open loop vector control	Closed loop vector control
	Start-up Torque	0.50Hz 180%	0.50Hz 200%	0.00Hz 200%
	Speed Range	1: 100	1: 200	1: 1000
	Speed stability accuracy	±0.5%	±0.2%	±0.02%
	Overload capacity	150% rated output current lasts 60 seconds 180% rated output current lasts 10 seconds 200% rated output current lasts 0.5 seconds		
Product Basic performance	Frequency setting mode	Digital setting+UP/DOWN Simulation setting Communication setting Pulse setting Main and auxiliary operation mode		
	Running command mode	Operation panel mode External terminal mode Modbus communication port		
	Acceleration and deceleration time	0.1s～6000.0s		
	Carrier frequency	1.0KHz～16.0KHz		
	Start-up mode	From Start frequency From Direct current injection From Speed tracking		
	Stop mode	Slowing down Free stop Deceleration + DC brake shutdown		
	Energy consumption braking function	Operation voltage of brake unit: 4T: 650V～750V The power of built-in brake unit≤22KW		
	DC braking function	Starting frequency DC brake: 0.00Hz ~ 50.00Hz DC brake current: 0% ~ 100% DC braking time: 0.00s ~ 10.00s		
	Electromagnetic brake function	Factory default Settings status		
Special Functions	Programmable input/output interface	The editable input interface is up to 49 functions The editable output interface is up to 34 functions		
	Closed-loop PID adjustable function	Built-in process PID closed loop regulation function		
	Simple PLC control	There is a built-in module in it, which can achieve timing and Multiple frequency output.		
	Textile pendulum frequency function	Built-in textile swing frequency function module		
	Parameters copy	Operation panel can upload and download the parameters.		
	Keyboard locked	Can lock the buttons of keyboard in different ways		
	User password	Can setup user password to prevent the parameters being modified		
Protection function	Automatic current limit protection	Output current can be limited automatically, in order to prevent failure of frequent overcurrent.		
	Over-pressure stall regulation	Busbar voltage can control automatically to prevent failure of overvoltage.		
	Overload forecasting warning and alarm	Overload can provide forecasting warning and protection in advance.		
	Input/output open phase protection	It can provide automatic detection and pre-alert protection.		

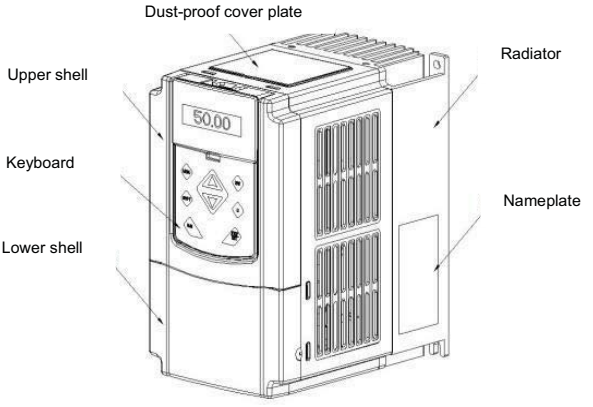
	Output inter-phase short circuit protection	Effective protection function of output inter-phase short circuit
	Output earthing short circuit protection	The output can protect the earthing short circuit effectively.
	Process PID setting and loss inspection	Process PID can identify its setting autamatically and feedback whether the pre - alert protective function is lost.
Environmental characteristics	Working environment temperature	-40℃～+60℃ Need derate at 40℃～60℃, the output current will derate 1% once it exceeds per 1℃.
	Storage environment temperature	-40℃～70℃
	Operation place	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt, etc.
	Altitude	Lower than 1000m rated, 1000~2500m need de-rate, when >2500m need confined space and de-rate.
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9m/s2
Efficiency	When at rated power, ⩽7.5KW, power efficiency level ⩾93%; ⩽45KW, power efficiency ⩾95%; ⩾55KW, power efficiency ⩾98%	
Others	Installation type	Wall-mounted
	Protection Level	IP20 (Can be customized in special occasions, maximum IP68)
	Cooling type	Air cooling (0.75kw standard natural cooling, 1.5kw and above have cooling fan)).

2.3 Products Rated Specifications

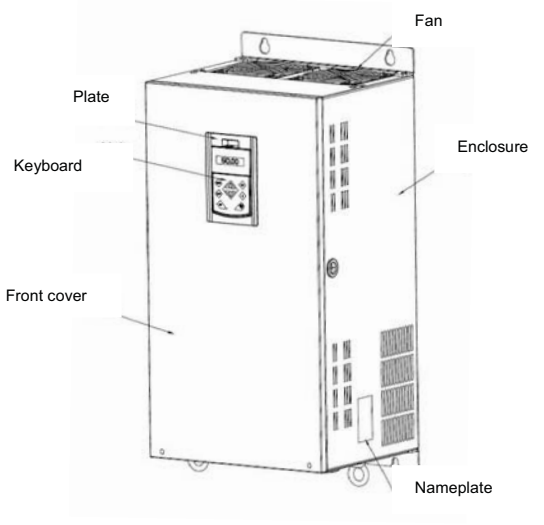
VFD Model	Power (KW)	Input Current (A)	Output Current (A)	Adaptable Motor (KW)	Braking Unit
TI260-2T0.75G/1.5LB	0.75	5.2	4.0	0.75	Standard Built-in
TI260-2T1.5G/2.2LB	1.5	8.3	7.5	1.5	Standard Built-in
TI260-2T2.2G/3.7LB	2.2	11.9	10	2.2	Standard Built-in
TI260-2T3.7G/5.5LB	3.7	19	17	3.7	Standard Built-in
TI260-2T5.5G/7.5LB	5.5	28	25	5.5	Standard Built-in
TI260-2T7.5G/11LB	7.5	35	32	7.5	Standard Built-in
TI260-2T11G/15LB	11	50	45	11	Standard Built-in
TI260-2T15G/18.5L	15	62	55	15	Optional built-in
TI260-2T18.5G/22L	18.5	77	70	18.5	Optional built-in
TI260-2T22G/30L	22	92	89	22	Optional built-in
TI260-2T30G/37L	30	113	110	30	Optional built-in
TI260-2T37G/45L	37	156	130	37	Optional built-in
TI260-2T45G/55L	45	176	160	45	Optional built-in
TI260-2T55G/75L	55	192	200	55	Optional built-in
TI260-2T75G/90L	75	285	310	75	External

TI260-2T90G/110L	90	326	350	90	External
TI260-2T110G/132L	110	354	383	110	External
TI260-2T132G/160L	132	441	470	132	External
TI260-4T0.75G/1.5LB	0.75	3.4	2.3	0.75	Standard Built-in
TI260-4T1.5G/2.2LB	1.5	5.2	3.8	1.5	Standard Built-in
TI260-4T2.2G/3.7LB	2.2	7.3	5.1	2.2	Standard Built-in
TI260-4T3.7G/5.5LB	3.7	11.9	9.0	3.7	Standard Built-in
TI260-4T5.5G/7.5LB	5.5	15	13	5.5	Standard Built-in
TI260-4T7.5G/11LB	7.5	19	17	7.5	Standard Built-in
TI260-4T11G/15LB	11	28	25	11	Standard Built-in
TI260-4T15G/18.5LB	15	35	32	15	Standard Built-in
TI260-4T18.5G/22LB	18.5	39	37	18.5	Standard Built-in
TI260-4T22G/30LB	22	50	45	22	Standard Built-in
TI260-4T30G/37L	30	62	60	30	Optional built-in
TI260-4T37G/45L	37	77	75	37	Optional built-in
TI260-4T45G/55L	45	92	90	45	Optional built-in
TI260-4T55G/75L	55	113	110	55	Optional built-in
TI260-4T75G/90L	75	156	152	75	Optional built-in
TI260-4T90G/110L	90	160	176	90	Optional built-in
TI260-4T110G/132L	110	192	214	110	Optional built-in
TI260-4T132G/160L	132	232	253	132	External
TI260-4T160G/185L	160	285	310	160	External
TI260-4T185G/200L	185	326	350	185	External
TI260-4T200G/220L	200	354	380	200	External
TI260-4T220G/250L	220	403	430	220	External
TI260-4T250G/280L	250	441	470	250	External
TI260-4T280G/315L	280	489	520	280	External
TI260-4T315G/355L	315	571	590	315	External
TI260-4T355G/400L	355	624	650	355	External
TI260-4T400G/450L	400	699	725	400	External
TI260-4T450G/500L	450	790	820	450	External
TI260-4T500G/560L	500	835	860	500	External
TI260-4T560G/630L	560	920	950	560	External
TI260-4T630G/710L	630	1050	1100	630	External

2.4 Part Name of each part



TI260-4T11G/15LB or under this Power level



TI260-4T15G/18.5LB or over this Power level

Chapter 3 Mechanical Installation

3.1 Installation Precautions

Danger

- Do not instalate if the parts is insufficient or damaged
- Install the drive on the incombustible objects made by metal; keep it far away from flammable objects.
- Operate it after the drive is disconnected for 10 minutes

Warning

- When moving the drive, please hold the bottom of the drive, not only hold the operation panel and cover plate.
- Do not drop the drilling residues, wire ends and screws into the drive during installation.

3.2 Installation Site Requirement

Ensure that the installation site to meet the following conditions:

- Avoid installing in such places where is exposed in direct sunlight, humidity and water droplets.
- Avoid installing in such places where is covered with the combustibles, explosive, Corrosive gases and liquid.
- Avoid installing in such places where is full of the oily dust, fiber and metal particles.
- Install it vertically on the flame retardant object which can bear the weight of the drive.
- Make sure that there is enough heat dissipation space around the drive, keep environment temperature within - 40 ~ + 60 ℃;
- Installation should be performed where is stable and the vibration is less than 5.9m/s2 (0.6g).

Notice:

1. Need derate if the drive running exceeds over 40℃, the drive will derate 1% once it exceeds 1℃. The maximum working temperature is 60℃.
2. Keep the environment temperature within -40 ~ +40 ℃, installed the drive in a well-ventilated place or add a cooling device, can improve the running reliability of the VFD.

3.3 Installation Direction and Space

The VFDs install vertically in order to keep the drive in good cooling effect, it must keep enough place between adjacent objects or baffle (such as the wall-body), just as the diagram below:

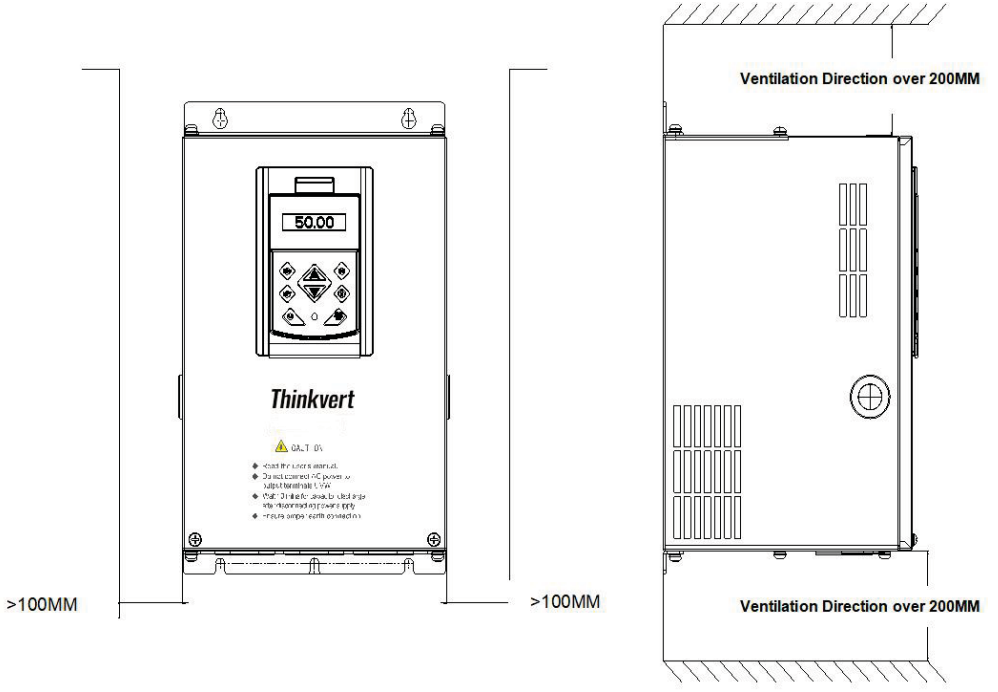
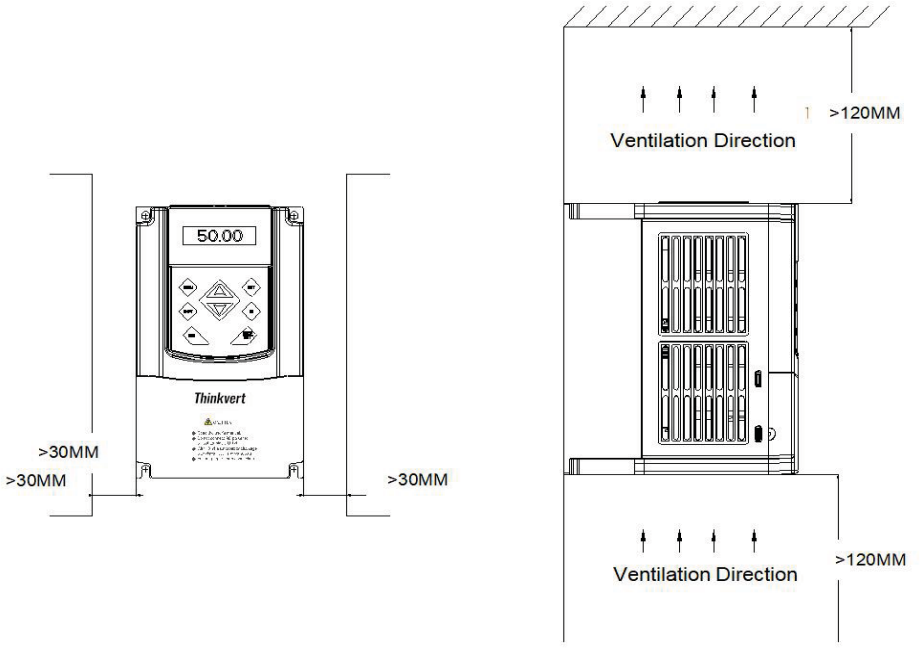


Figure 3-1(a)TI260-4T11G/15LB or under this power level installation direction and space requirement

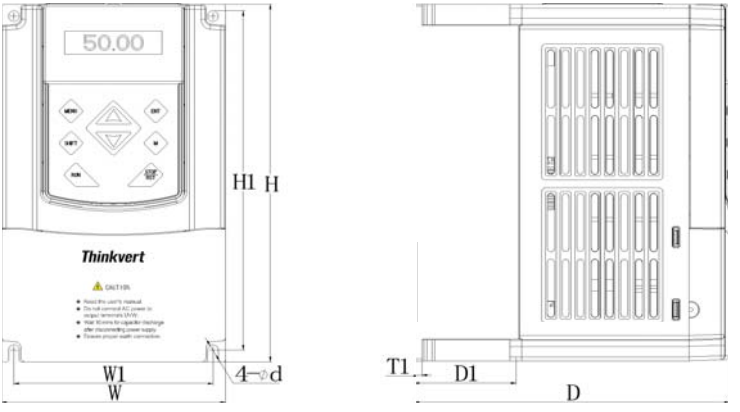
Note:

When TI260-4T11G/15LB and under power level inverter is installed inside of the enclosure, please remove the inverter dust cover plate; when install more than one inverters in it, parallel side-by-side mounting is recommended.

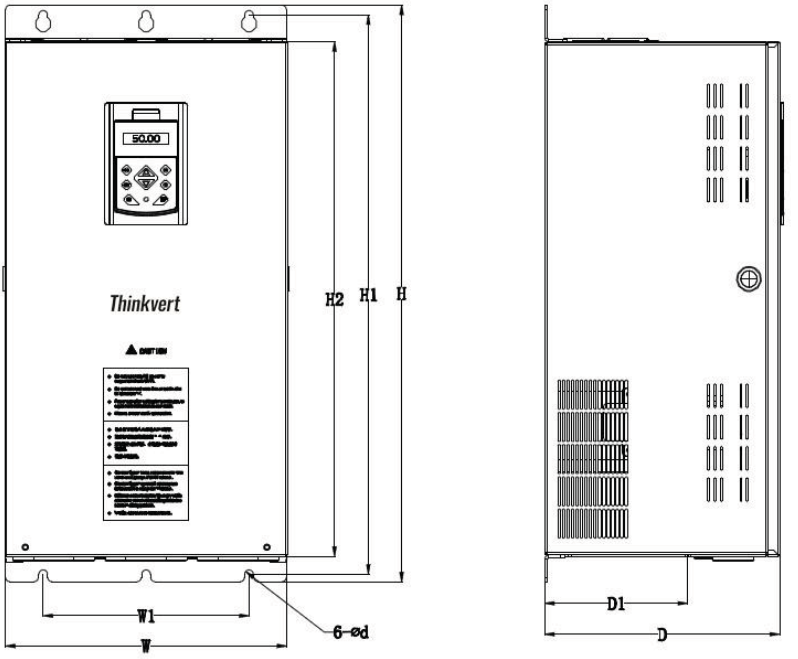


3-1(b)TI260-4T15G/18.5LB or over this power level installation direction and space requirement

3.4 Outer Size and Mounting Dimension



TI260-4T11G/15LB or under this Power level



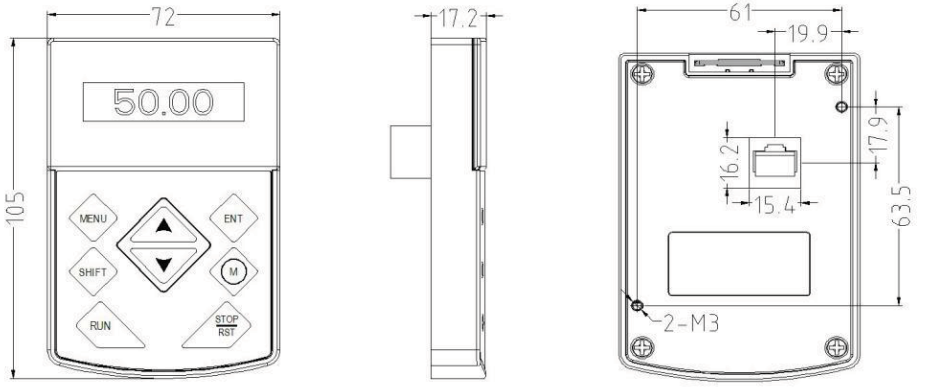
TI260-4T15G/18.5LB or over this Power level

Figure 3-1 TI260 series Overall dimensions

VFD Model	External and installation dimensions (MM)								Weight (KG)
	W	H	D	W1	H1	D1	H2	Mounting hole dia.	
TI260-2T0.75G/1.5LB	115	185	161	102	173	50	—	5.5	2.6
TI260-2T1.5G/2.2LB									
TI260-2T2.2G/3.7LB									
TI260-2T3.7G/5.5LB	137	247	176	125	235	62	—	5.5	4
TI260-2T5.5G/7.5LB									
TI260-2T7.5G/11LB	178	375	185	100	357	107	333	7	9
TI260-2T11G/15LB	218	430	195	140	415	102	390	7	12
TI260-2T15G/18.5L	285	568	210	200	550	119	510	7	22
TI260-2T18.5G/22L									
TI260-2T22G/30L	315	645	265	230	625	148	575	10	40
TI260-2T30G/37L									
TI260-2T37G/45L	338	750	290	230	730	148	680	10	40
TI260-2T45G/55L									
TI260-2T55G/75L									

VFD Model	External and installation dimensions (MM)								Weight (KG)
	W	H	D	W1	H1	D1	H2	Mounting hole dia.	
TI260-2T75G/90L	430	785	345	280	761	132	710	12	75
TI260-2T90G/110L	540	964	385	350	938	176	881	14	118
TI260-2T110G/132L									
TI260-2T132G/160L	700	1004	385	520	978	176	922	14	155
TI260-4T0.75G/1.5LB	115	185	161	102	173	50	—	5.5	2.6
TI260-4T1.5G/2.2LB									
TI260-4T2.2G/3.7LB									
TI260-4T3.7G/5.5LB									
TI260-4T5.5G/7.5LB	137	247	176	125	235	62	—	5.5	4
TI260-4T7.5G/11LB									
TI260-4T11G/15LB									
TI260-4T15G/18.5LB	178	375	185	100	357	107	333	7	9
TI260-4T18.5G/22LB									
TI260-4T22G/30LB	218	430	195	140	415	102	390	7	12
TI260-4T30G/37L	285	568	210	200	550	119	510	7	22
TI260-4T37G/45L									
TI260-4T45G/55L	315	645	265	230	625	148	575	10	40
TI260-4T55G/75L									
TI260-4T75G/90L	338	750	290	230	730	148	680	10	40
TI260-4T90G/110L									
TI260-4T110G/132L									
TI260-4T132G/160L	430	785	345	280	761	132	710	12	75
TI260-4T160G/185L	540	964	385	350	938	176	881	14	118
TI260-4T185G/200L									
TI260-4T200G/220L									
TI260-4T220G/250L									
TI260-4T250G/280L	700	1004	385	520	978	176	922	14	155
TI260-4T280G/315L									
TI260-4T315G/355L									
TI260-4T355G/400L	810	1234	430	630	1208	176	1150	14	225
TI260-4T400G/450L									
TI260-4T450G/500L									
TI260-4T500G/560L	920	1268	460	740	1240	185	1180	14	265
TI260-4T560G/630L									
TI260-4T630G/710L									

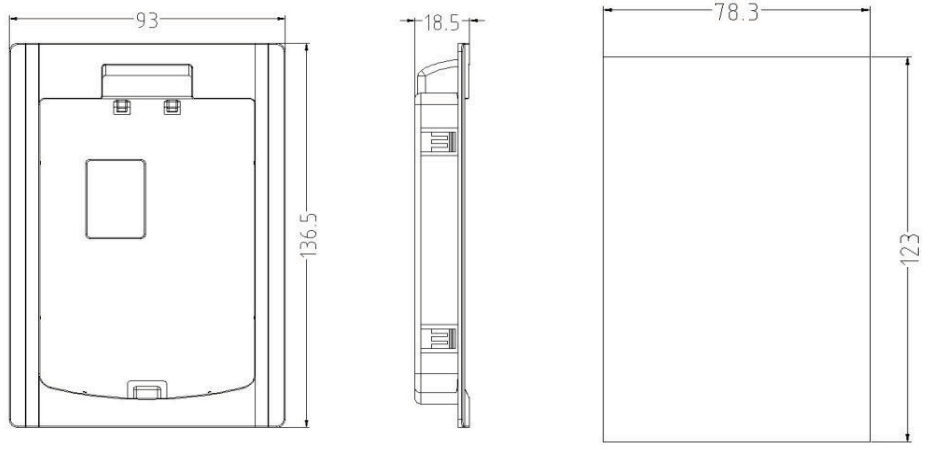
3.5 Operation Panel Installation and Dismantlement



3-4 Operation Panel outer size and installation size

3.6 Supporting Plate configuration and Installation Dimension

Operation panel can install inside the plate once it needs introduction to the electric control cabinet, the diagram below shows the plate shape and the size of opening holes.



3-5 Surporting panel outer size

3.7 Disassembly and installation of operation panel and cover plate

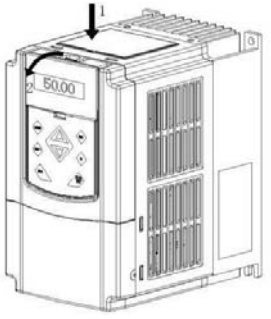
3.7.1 Operation Panel & Cover-plate Removing and Mounting

Operation Panel Disassembling

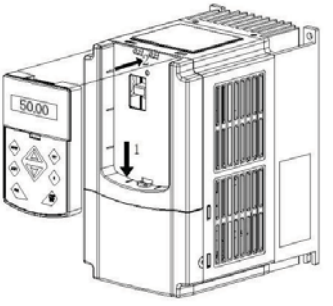
As per shown in figure 3-6, follow direction 1 to press the hook of the panel, follow direction 2 to uplift the panel

Operation Panel installing

As per shown in figure 3-7, follow direction 1 to buckle the lower hook of the panel, follow direction 2 to press the panel, When "click" sounds heard, it indicates clamping has been properly made.
Do not install the panel from other direction; otherwise, the panel may be damaged by disconnecting.



3-6 Operation Panel Disassembling



3-7 Operation Panel installing

3.7.2 Cover-plate of Plastic Enclosure VFD Removing and Mounting

Cover-plate Disassembling

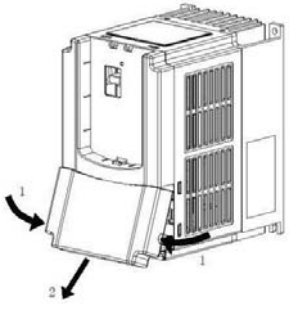
Please refer to figure 3.7.1 above

Lower Coverplate Disassembling

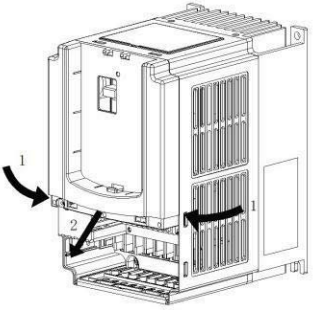
As per shown in figure 3-8, follow direction 1 to press down the hooks on both sides of the panel, follow direction 2 to uplift the lower coverplate.

Top coverplate Disassembling

As per shown in figure 3-9, follow direction 1 to press the hooks on both sides of the coverplate, in the same time, follow direction 2 to uplift the top coverplate.



3-8 Lower coverplate Disassembling



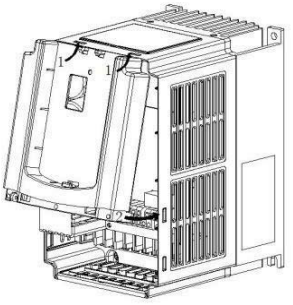
3-9 Top coverplate Disassembling

Top coverplate Installation

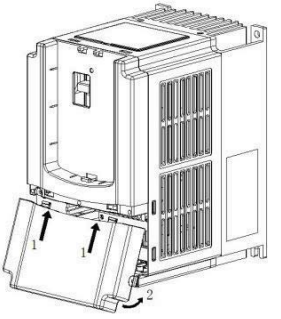
After main circuit terminal wiring terminal and control circuit is completed, embed the top coverplate card buckle into the groove of frequency inverter, detail see 3-10 position 1.

Lower coverplate Installation

Embed the lower coverplate card buckle into the groove of lower of top coverplate, detail see 3-10 position 2, then press under side of the lower coverplate as shown in 3-11 position 2



3-10 Upper coverplate Installation



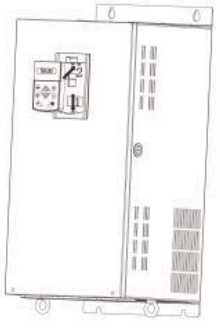
3-11 Lower coverplate Installation

3.7.3 Sheet metal power level box cover Removing

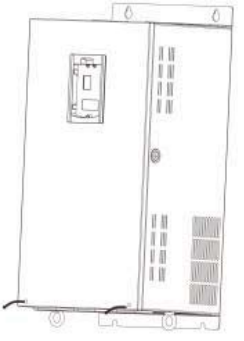
Operation panel removing

As shown in Figure 3-12, dig out operation panel, Pull off the net-line and remove the operation panel.

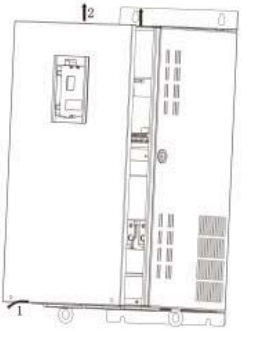
As shown in Figure 3-13, unscrew 2 installation screws shown in position1 and 2, then lift the cover as shown in position 1direction and exit the cover as shown in position 2 direction.



3-12 Panel Removing



3-13 Removing fixed screw



3-14 Cover Removing

Note:

When remove the cover, pull out operation panel, then pull out netline. While installing the cover, insert netline, then install the operation panel, otherwise it will cause damage to the operation panel caused by bad contact.

Chapter 4 Electric Installation

4.1 Wiring Precaution

Danger

- Only qualified professional personnel in motor VFDs are allowed to implement wiring.
- Ensure that input power supply is completely shut down before wiring.
- Open the drive coverplate to proceed to wiring operation 10 minutes after the power supply shut down. Do NOT operate wiring or dismantling internal components of the drier during the power supply is working.
- Proceed wiring only after confirming that the charge indicator inside the drive has been extinguished and the voltage between the power terminal (+) and (-) is less than 36V.
- After connecting the external power supply scram terminals, be sure to check if the connection is effective and reliable.
- The drive must connect to grounding line reliably, the drive generates leakage current, and we must use two independent grounding lines to ensure the VFD is fully connected with the grounding line.
- When using the earth leakage protective device (ELCB/RCD), only Ty.e. B type is recommended..
- When the drive is charging, do NOT touch the amphenol connectors. Drive power terminals must not be connected to the product shell, do not make short circuit between power terminals.

Warning

- Do not test the VFD for pressure resistance.
- Please connect the brake resistance or the brake unit according to the wiring diagram.
- Fasten and fixe the terminals.
- Please do not connect the input power line to the output U/V/W terminal.
- Do not connect the phase-shifting capacitance to the output circuit.
- Please do NOT switch motor or frequency conversion / power frequency until the VFD stops.
- Do not connect the VFD's DC bus terminal to a short connection.

4.2 Peripheral Devices Type Selection

According to different power levels of VFDs, we recommend the air switch MCCB, contactor capacity and copper core insulation wire cross-sectional area as shown in table 4-1.

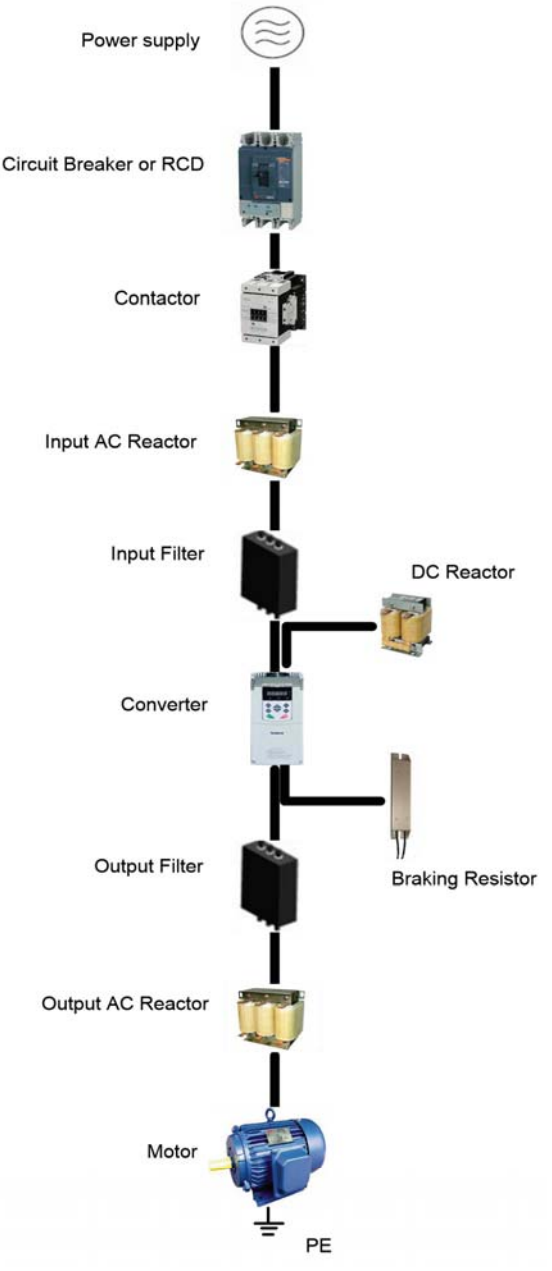


Figure 4-1 Recommendation table of TI260 series VFD input and output line specification

Model	Input line protection		Power Cable		Signal Line (mm^2)
	Air switch MCC(A)	Contactor (A)	Power cable (mm^2)	Motor Line (mm^2)	
TI260-2T0.75G/1.5LB	25	16	2.5	2.5	≥0.5
TI260-2T1.5G/2.2LB	32	25	2.5	2.5	≥0.5
TI260-2T2.2G/3.7LB	40	32	4.0	4.0	≥0.5
TI260-4T0.75G/1.5LB	10	10	1.0	1.0	≥0.5
TI260-4T1.5G/2.2LB	16	10	1.0	1.0	≥0.5
TI260-4T2.2G/3.7LB	16	10	1.5	1.5	≥0.5
TI260-4T3.7G/5.5LB	25	16	2.5	2.5	≥0.5
TI260-4T5.5G/7.5LB	32	25	4.0	4.0	≥0.5
TI260-4T7.5G/11LB	40	32	4.0	4.0	≥0.5
TI260-4T11G/15LB	63	40	6.0	6.0	≥0.5
TI260-4T15G/18.5LB	63	40	6.0	6.0	≥0.5
TI260-4T18.5G/22LB	100	63	10	10	≥0.5
TI260-4T22G/30LB	100	63	16	16	≥0.5
TI260-4T30G/37L	125	100	25	25	≥0.5
TI260-4T37G/45L	160	100	25	25	≥0.5
TI260-4T45G/55L	200	125	35	35	≥0.5
TI260-4T55G/75L	200	125	50	50	≥0.5
TI260-4T75G/90L	250	160	70	70	≥0.5
TI260-4T90G/110L	250	160	95	95	≥0.5
TI260-4T110G/132L	350	350	120	120	≥0.5
TI260-4T132G/160L	400	400	150	150	≥0.5
TI260-4T160G/185L	500	400	185	185	≥0.5
TI260-4T185G/200L	600	500	240	240	≥0.5
TI260-4T200G/220L	600	600	150*2	150*2	≥0.5
TI260-4T220G/250L	600	600	150*2	150*2	≥0.5
TI260-4T250G/280L	800	600	185*2	185*2	≥0.5
TI260-4T280G/315L	800	800	185*2	185*2	≥0.5
TI260-4T315G/355L	800	800	185*2	185*2	≥0.5
TI260-4T355G/400L	800	800	185*2	185*2	≥0.5
TI260-4T400G/450L	1250	1000	240*2	240*2	≥0.5
TI260-4T450G/500L	1250	1000	240*2	240*2	≥0.5

Model	Input line protection		Power Cable		Signal Line (mm^2)
	Air switch MCC(A)	Contactor (A)	Power cable (mm^2)	Motor Line (mm^2)	
TI260-4T500G/560L	1600	1600	240*3	240*3	≥0.5
TI260-4T560G/630L	1600	1600	240*3	240*3	≥0.5
TI260-4T630G/710L	1600	1600	240*3	240*3	≥0.5
Remark: * 2, * 3 & *4 refers to two, three, four power cables in parallel					

Figure 4-2 Recommendation table of TI260 series VFD brake resistance

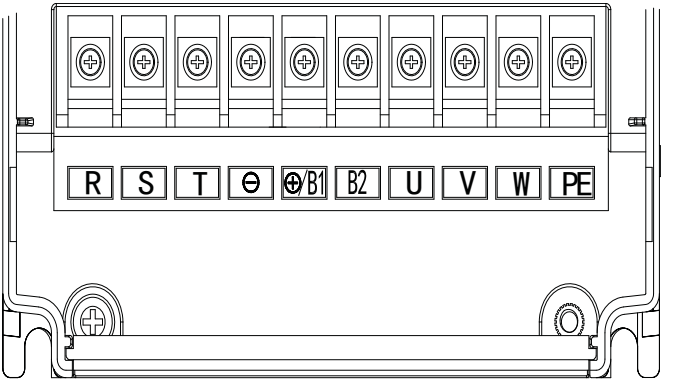
VFD Model	Brake Unit	Standard Resistor	Standard Power	Min limit Resistor value	Braking Rate
TI260-2T0.75G/1.5LB	Standardl Built-in	200Ω	150W	150Ω	20%
TI260-2T1.5G/2.2LB		100Ω	300W	66.7Ω	20%
TI260-2T2.2G/3.7LB		100Ω	450W	66.7Ω	20%
TI260-2T3.7G/5.5LB		50Ω	800W	40Ω	20%
TI260-2T5.5G/7.5LB		40Ω	1.6KW	25Ω	20%
TI260-2T7.5G/11LB		18.4Ω	1.6KW	15Ω	20%
TI260-2T11G/15LB		12.5Ω	2.0KW	9Ω	20%
TI260-2T15G/18.5L	Optional Built-in	9.2Ω	2.0KW	7Ω	20%
TI260-2T18.5G/22L		7.4Ω	4.8KW	6Ω	20%
TI260-2T22G/30L		6.3Ω	4.8KW	5Ω	20%
TI260-2T30G/37L		4.6Ω	6.0KW	4Ω	20%
TI260-2T37G/45L		3.7Ω	9.0KW	3Ω	20%
TI260-2T45G/55L		3.1Ω	9.0KW	2.8Ω	20%
TI260-2T55G/75L		2.5Ω	12KW	2.0Ω	20%
TI260-4T0.75G/1.5LB	Standardl Built-in	300Ω	150W	125Ω	20%
TI260-4T1.5G/2.2LB		250Ω	300W	100Ω	20%
TI260-4T2.2G/3.7LB		200Ω	450W	100Ω	20%
TI260-4T3.7G/5.5LB		100Ω	800W	66.7Ω	20%
TI260-4T5.5G/7.5LB		50Ω	1600W	40Ω	20%
TI260-4T7.5G/11LB		50Ω	1600W	40Ω	20%
TI260-4T11G/15LB		40Ω	2000W	25Ω	20%

TI260-4T15G/18.5LB		40Ω	2000W	25Ω	20%
TI260-4T18.5G/22LB		32Ω	4800W	20Ω	20%
TI260-4T22G/30LB		27.2Ω	4800W	20Ω	20%
TI260-4T30G/37L	Optional Built-in	20Ω	6000W	14Ω	20%
TI260-4T37G/45L		16Ω	9000W	14Ω	20%
TI260-4T45G/55L		13.6Ω	9000W	10Ω	20%
TI260-4T55G/75L		10Ω	12000W	7Ω	20%
TI260-4T75G/90L		8Ω	15000W	5Ω	20%
TI260-4T90G/110L		5Ω	18000W	3.3Ω	20%
TI260-4T110G/132L		5Ω	22000W	3.3Ω	20%

- ✧ Braking resistor value must be higher than the minimum limit value shown as above; otherwise it may damage the brake unit.
- ✧ Try to choose aluminum resistor instead of corrugated resistor, the parasitic inductance of corrugated resistance is higher; resistor presents negative temperature characteristics, after braking resistor keep running a period of time, resistance value decreases with temperature rising, which is easy to damage the brake unit.
- ✧ The higher the power is, the better the braking performance is, please increase the power of braking resistor if the braking lasts for a long time or the load is too heavy.

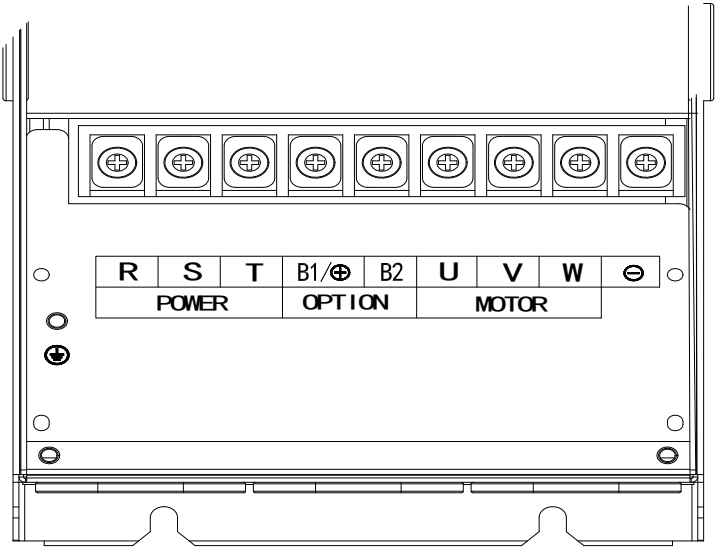
4.3 Main circuit Terminals and Wiring

Main circuit Terminals of TI260-4T0.75G/1.5L B～TI260-4T11G/15LB



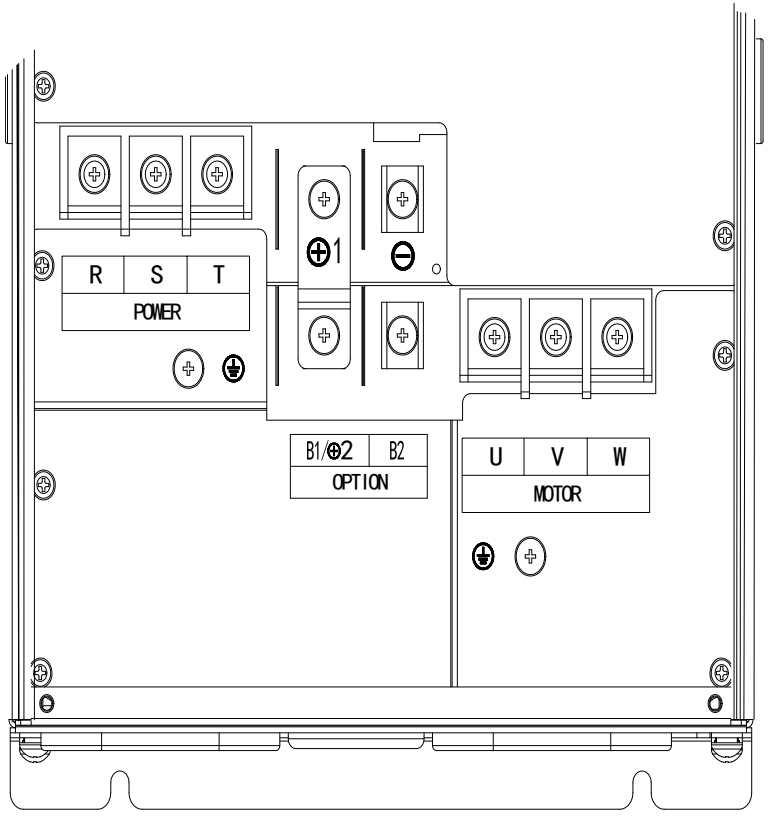
Terminal Symbols	Terminal name and Function Description
R, S, T	Three-phase AC input terminals
U, V, W	Three-phase AC output terminals
⊕B1, B2	Braking resistor connection terminals
⊖, ⊕B1	DC power input terminal; DC input terminal of external brake unit
PE	Ground terminal PE

Main circuit Terminals of TI260-4T15G/18.5LB～TI260-4T22G/30LB



Terminal Symbols	Terminal name and Function Description
R, S, T	Three-phase AC input terminal
U, V, W	Three-phase AC output terminal
B1/⊕ , B2	Brake resistance terminal
B1/⊕,⊖	DC power input terminal; DC input terminal of external brake unit
⏚	Ground terminal PE

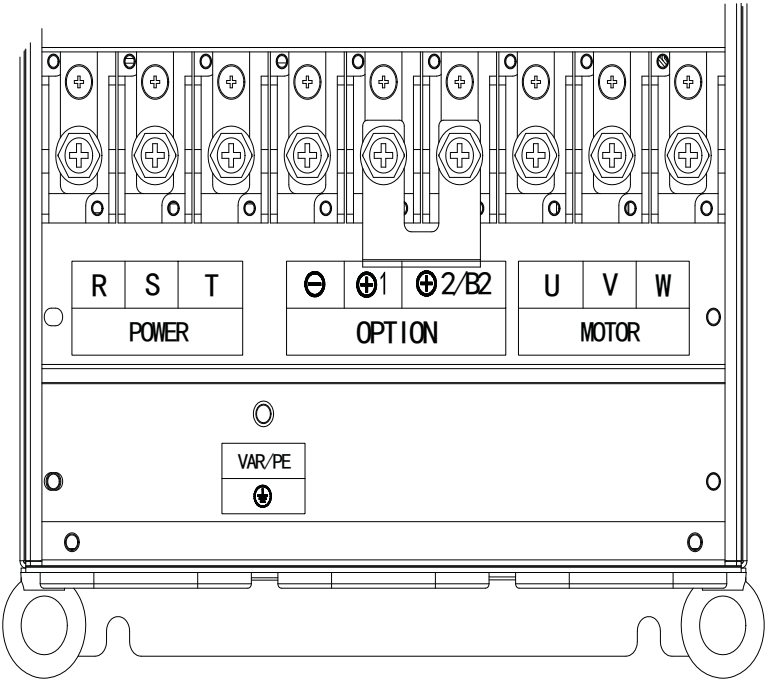
Main circuit Terminals of TI260-4T30G/37L(B)～TI260-4T37G/45L(B)



Terminal	Terminal name and Function Description

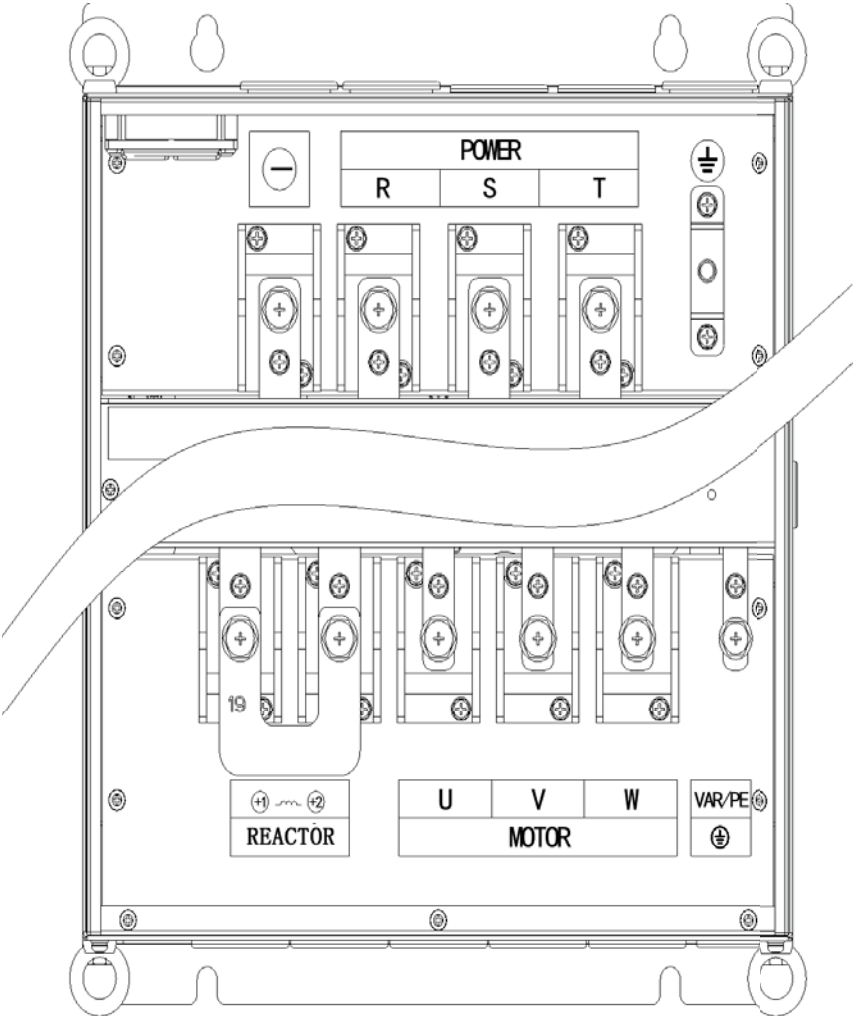
Symbols	
R, S, T	Three-phase AC input terminal
U, V, W	Three-phase AC output terminal
B1/⊕2,B2	Brake resistance terminal
⊕1,B1/⊕2	DC reactor connecting terminal, short circuit by copper wire when leave factory.
⊕1,⊖	DC power input terminal; DC input terminal of external brake unit
⏚	Ground terminal PE

Main circuit Terminals of TI260-4T45G/55L(B)～TI260-4T55G/75L(B)



Terminal Symbols	Terminal name and Function Description
R, S, T	Three-phase AC input terminal
U, V, W	Three-phase AC output terminal
B1,B2	Brake resistance terminal
⊕1, ⊕2/B2	DC reactor connecting terminal, short circuit by copper wire when leave factory.
⊕1,⊖	DC power input terminal; DC input terminal of external brake unit
VAR/PE	Ground terminal PE

Main circuit Terminals of TI260-4T75G/90L+

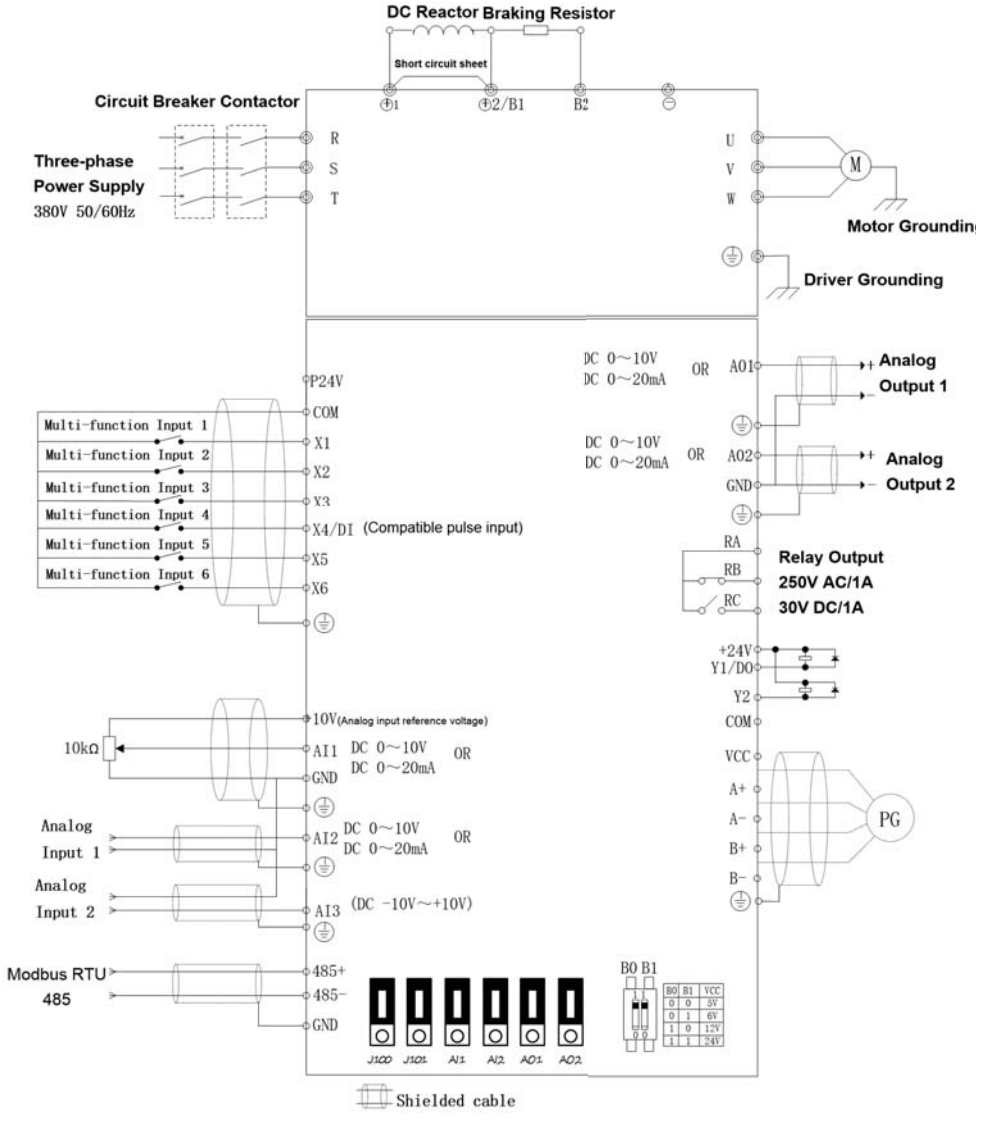


Terminal Symbols	Terminal name and Function Description
R, S, T	Three-phase AC input terminal
⊕1, ⊕2	DC reactor connecting terminal (short circuit by copper wire under 185KW when leave factory.)
U, V, W	Three-phase AC output terminal
⊕1,⊖	DC power input terminal; DC input terminal of external brake unit
VAR/PE	Ground terminal PE

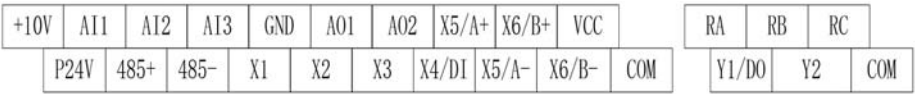
4.4 Control panel Terminals and Wiring

To reduce control signal disturbance and attenuation, the length of control signal wire should be limited within 50m, the distance between signal wire and power line should be more than 0.3m, please use twisted-pair shielded wire when connecting analog input and output signals.

4.4.1 Control Panel Diagram



Control board terminal function description



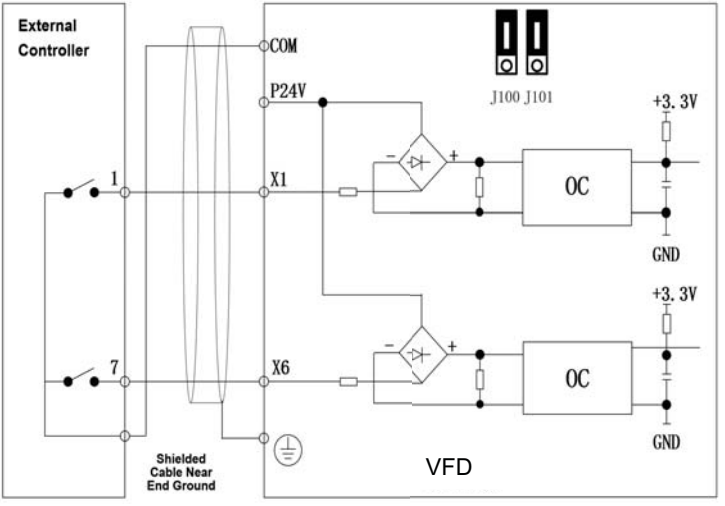
Category	Symbol	Terminal Name	Function Description
Digital Input	X1～X6	Multi-function Digital Input 1～6	Input Voltage: 0～30VDC Input Frequency: 0～200Hz Programmable input is optional
	X4/DI	Multi-function/ Pulse Input	Multi-function Input: Same as X1～X6 Pulse Input: 0.1KHz ～ 50KHz (Higher frequencies can be customized)
Analog Input	AI1	Analog Input 1	Input voltage/current signal is optional: jumper selection Input Signal range: 0～10V/0～20mA
	AI2	Analog Input 2	
	AI3	Analog Input 3	Input voltage signal:-10V～+10V
Digital Output	Y1/DO	Open circuit collector / Pulse output	Open circuit collector output: output voltage range: 0-30VDC; maximum output current: 50 mA programmable output selection Pulse output: 0.1KHz~50KHz (higher frequency can be customized)
	Y2	Open circuit collector	Open circuit collector output: same as Y1
Analog Output	AO1	Analog Output 1	Output voltage/current signal optional : jumper selection Output Signal range: 0～10V / 0～20mA Programmable output is optional
	AO2	Analog Output 2	Same as A01
Relay Output	RA/RB/RC	Relay contact output	Programmable output; Contact Capacity:250VAC/3A or 30VDC/1A RA, RB: Normally-closed contact RA, RC: Normally-open contact
Terminal 485	485+	485 positive differential signal	Communication rate: 4800bps～115200bps Maximum transmission distance: 500(Adopt standard twisted-pair shielded wire)
	485-	485 negative differential signal	
Encoder signal input	A+	Positive A Phase input	Selection difference /OC input mode is selected when go through B0 and B1; while OC mode is selected, then terminal can not be connected.
	A-	Negative A Phase input	Terminal is directly connected to encoder A when B0 and B1 selection differential /OC input mode and OC mode are selected.
	B+	Positive B Phase input	Selection difference /OC input mode is selected when go through B0 and B1; while OC mode is selected, then terminal can not be connected.
	B-	Negative B Phase	Terminal is directly connected to

		input	encoder B when B0 and B1 selection differential /OC input mode and OC mode are selected.
Power Supply	P24V	Internal +24V power supply is default, PLC and external +24V power supply is Optional.	Power specification:24V±20% ≤3.7KW: 300mA ≥5.5KW: 1A
	VCC	Encoder power supply	Select 5V, 6V, 12V, 24V power supply through B0 and B1
	COM	+24V/VCC Power supply Reference	Digital input and output, internal and GND is isolated
	+10V	+10V Power Supply	Analog input +10V power supply
	GND	+10V Power Supply reference	Analog, internal and COM is isolated

4.4.2 Control terminal wiring

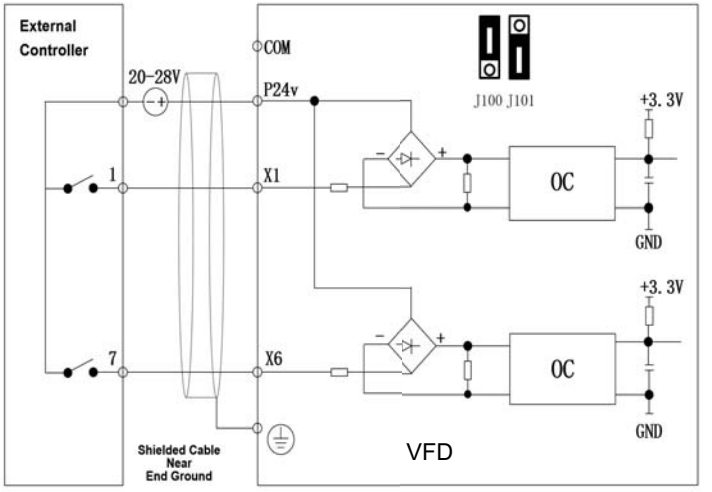
Dry contact connection mode

1. Use +24V power inside the VFD, jump line switch J100 and J101 selection and wiring shown in 4-2 diagram



4-2 Schematic diagram of input trunk connection signal by using internal 24V

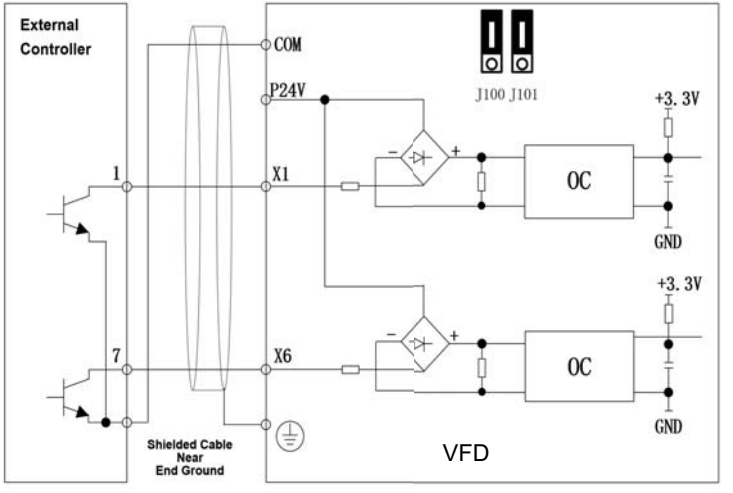
2. When use external power, jump line switch J100, J101 selection and wiring shown in 4-3 diagram.



4-3 Schematic diagram of connection signal wiring by using external power supply

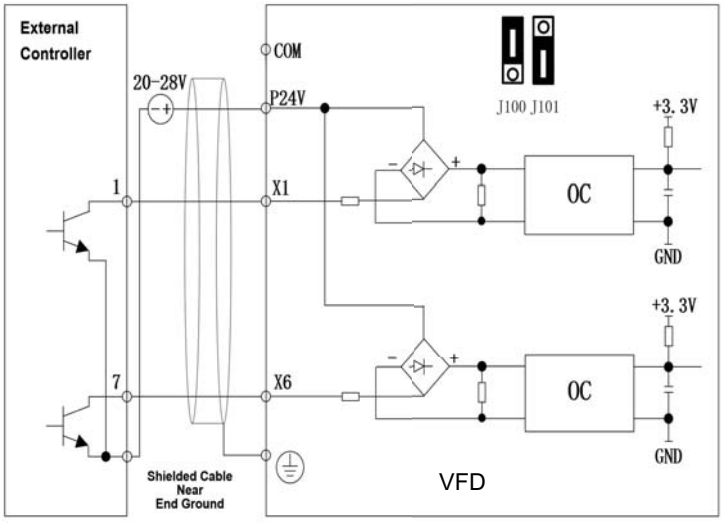
Source (leakage) mode

1. By using open collector NPN connection mode of internal power supply, jumper switch J100, J101 selection and wiring are shown as shown in Figure 4-4.



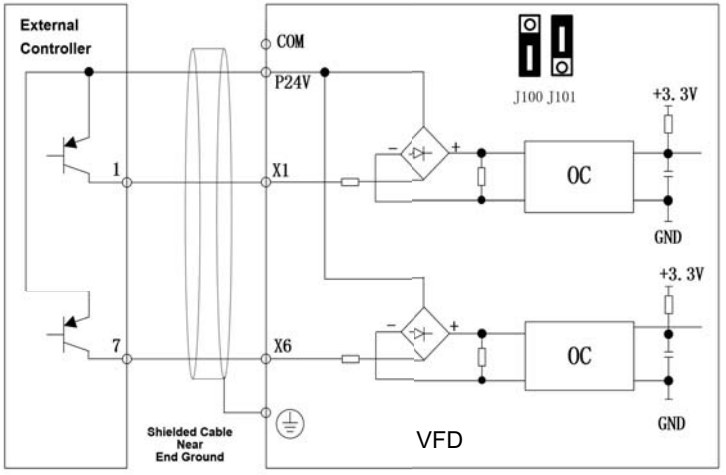
4-4 Schematic diagram of input signal source input wiring by using internal power supply

2. By using open circuit collector NPN connection mode of external power supply, jumper switch J100, J101 selection and wiring are shown as shown in Figure 4-5.



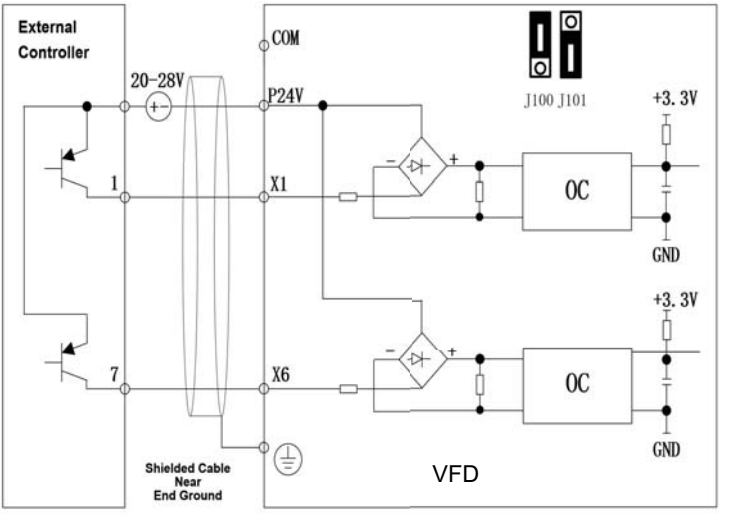
4-5 Schematic diagram of input signal leakage input wiring by using external power supply

3. By using open circuit collector NPN connection mode of internal power supply, jumper switch J100, J101 selection and wiring are shown in Figure 4-6.



4-6 Schematic diagram of PNP(Source) signal input wiring by using internal power supply

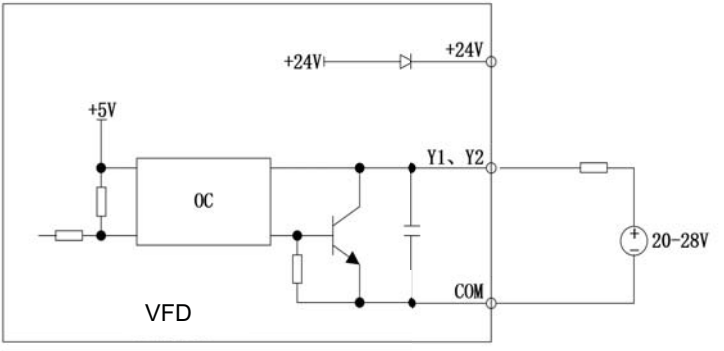
4. By using open circuit collector NPN connection mode of +24V eternal power supply, jumper switch J100, J101 selection and wiring are shown in Figure 4-7.



4-7 Schematic diagram of PNP signal (leakage) input connection by using external 24V power supply

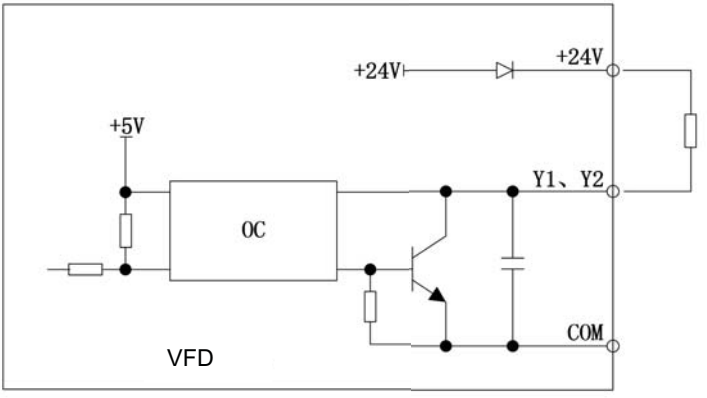
Multifunction terminal connection

1 By using with external power supply, the function output terminal Y1 and Y2 wiring are shown Figure 4-8.



4-8

2 Function output terminal Y1 and Y2 connect the pull resistor using 24V power supply inside the drive is shown in Figure 4-9.



4-9

3 Function output terminal Y1, Y2 VFDs the relay to use 24V power supply inside the drive. Wiring method is shown in Figure 4-10.

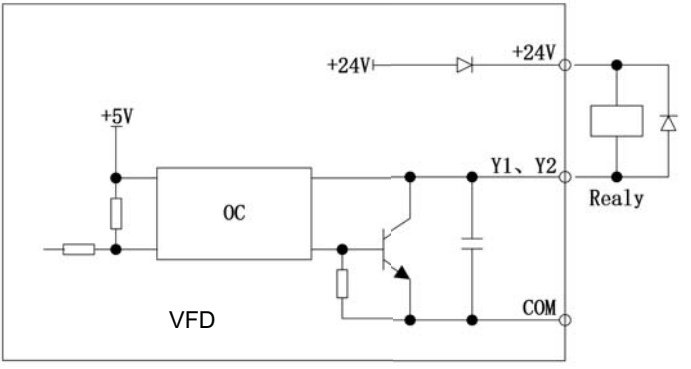


图 4-10

4 Function output terminals Y1, Y2 drive the relay and use external power supply, wiring method is shown in Figure 4-11

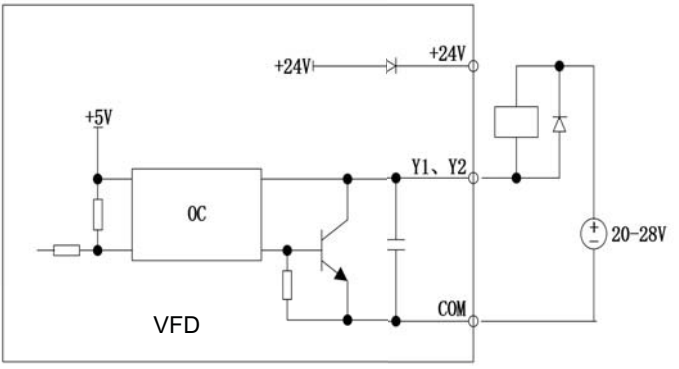


图 4-11

4.5 Installation Guide

4.5.1 Motor wiring

The longer the distance between the drive and motor wiring, the higher carrier frequency is and the higher the harmonic leakage current on the cable is. Leakage flows may have negative effects on the drive and nearby equipment.

When the distance between motor and VFD is more than 100 meters, AC output reactor is recommended, detail please refer to table 4-14 for carrier frequency Settings

4-2 Connection distance and carrier frequency between drive and motor

Wiring distance between drive and carrier	< 30m	30－50m	50－100m	≥ 100m
Carrier frequency Settings	<15kHz	<10kHz	<5kHz	<2kHz

When motor cable is too long or cross-sectional area is too large, derating is needed, VFD cable need use requested one (see in table 4-1). Because the larger cross-sectional area of the cable, the higher the earth capacitance, the greater the floor drain current, When using a cable with larger cross-sectional area, output current should be reduced, the area increases one grade, then current decreases about 5%.

4.5.2 Grounding/Earthing

Drive earthing terminal PE/⏚ must be grounded, the grounding location should be as short as possible (should be closer to drive), grounding area should be as large as possible.

Earthing resistance value should be less than 10 Ω

Do not share ground wire with other power equipment, yet it can share ground electrode, but it is better for all equipment has its dedicated wires. Recommended grounding method is shown in figure 4-9, while avoidable grounding method is shown in figure 4-10.

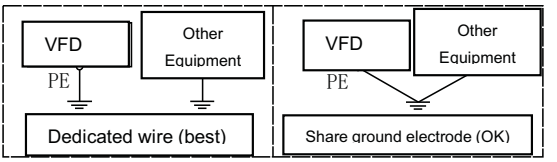


Figure 4-9 Recommended grounding

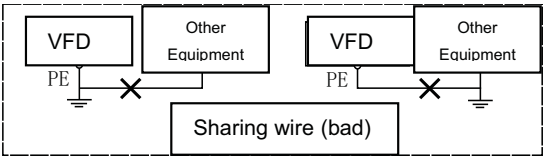


Figure 4-10 Avoidable grounding

When more than one VFDs are running at the same time, do NOT make ground wire into a loop as shown in figure 4-11

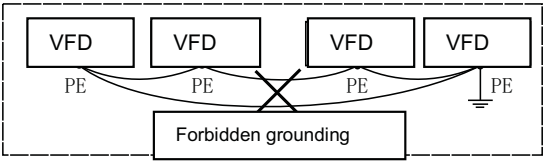


Figure 4-11 Forbidden grounding

4.5.3 EMI Filter

EMI Filter should be used on such equipment that can produce strong interference or be sensitive to interference. EMI filter is two-way low-pass filter, it allows low frequency electric current to pass through, but not easy for the high frequency electromagnetic interference electric current passing through.

Function of EMI Filter

1 . EMI filter can make the equipment meet the requirement of conducted emission and conducted susceptibility shown in the standard of electromagnetic compatibility, can restrain radiation emission of the equipment.

2. EMI filter can prevent the electromagnetic interference generated by the equipment itself into power cord; meanwhile prevent interference of power cord into the equipment.

Common Errors in EMI Filter Installation

1. Cables between EMI filter and Drive are too long

Filter installation location inside the cabinet should be close to the power cord entry, and the power input cable of the filter should be as short as possible in the cabinet.

2. Input cable of EMI filter is too close to the output cable

If input cable of EMI filter is too close to the output cable, High frequency interference signals will be coupled directly through input and output cables of EMI filter, the filter will be bypassed, which makes the filter of power cord failure.

3. EMI Filter Bad Grounding

EMI filter shell must be wired with metal box reliably. Filter shell usually has a dedicated earthing terminal, but connect the filter to the main case with a wire, it is useless for high frequency disturbance signal, it is because the impedance (non resistor) of long wires is very high at high frequency, which could not play the rule of bypass effectively.

Correct installation way: Paste EMI filter shell directly on conductive plane of the metal case, and pay attention to removing insulating varnish.

4.5.4 Conduction, radiation and radio frequency interference Solution

Drive radiation emission

Drive working principle determines the radiation emission is inevitable, VFDs are usually put into a metal cabinet, for the equipment outside the metal cabinet, it is almost not affected by the radiation emission of the drive itself. External connection cable is the main radiation emission source, it can effectively restrain the radiation emission of the cable if follow the wiring requirements mentioned in this section.

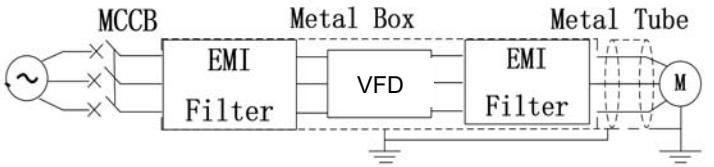
If VFDs and other control devices are put into the same metal cabinet, Should be carefully considered when designing the cabine according to the principle of the partition, pay attention to the isolation of each interval, cable wiring, shielding and lap joint.

Conducted interference Solutions

To restrain the output side of the conducted interference, except for installation noise filter, it also can adopt to import the output cables to the grounding metal tube. The distance between Output wires and signal lines should be more than 0.3m, influence of the conducted interference is obviously reduced.

Radio frequency interference Solutions

Input cables, output cables and VFDs itself can generate radio frequency interference, Instal EMI filters on both sides of input and output, and use iron ware shield, then can reduce the radio frequency interference. The wire to connect drive and motor should be as short as possible. Solution for reducing radio frequency interference is shown in figure 4-12.



4-12 Radio frequency interference Solution

4.5.5 Input and Output Reactor

AC Input Reactor

The purpose of AC input reactor is to increase power factor of the input side and eliminate high-order harmonics of the input side effectively, as well as to prevent any damage of other devices caused by voltage wave distortion, and eliminate imbalance of input current caused by the imbalance between the power supply phases.

DC Reactor

The power factor of the input side can be increased if DC reactor is added, the efficiency and thermal stability of the VFD can be improved, and the influence of the high-order harmonic of the input side on the VFD can be effectively eliminated, and the external conduction and radiation interference can be reduced.

AC Output Reactor

When distance between the cable and motor drive is more than 100 meters, it will produce large leakage current, which leads to VFD protection, at this time, it is suggested to install an output of AC reactor.

Chapter 5 Operation and Run

DANGER

- Drive can power on only after outer shell is well mounted on the drive. It is forbidden to remove the outer shell after drive is power on.
- Before drive starts the motor and mechanical equipments, please ensure that the motor and mechanical equipment are running under the allowed scope.
- If the mian control needs change, the parameters must be setted up correctly, then it can running smoothly.

WARNING

- It is prohibited to inspect and measure signal when the drive is running.
- Do NOT change the parameter settings of the drive at random.
- Be sure to do switch debugging before drive run command channel switchover
- The temperature of energy consumption braking resistor is very high, please do NOT touch.

5.1 Explanation

Note:

In the subsequent sections, the nouns descriptions related to the operation, control, running and states of the VFDs will be mentioned many times. Please read this section carefully before using the product in order to properly understand and use the function mentioned in the subsequent chapters.

5.1.1 Operation Mode

It defines the VFD receives commands run (starting, running, stopping and inching) physical channel of operation. 3 kinds of channel sources are listed below, which can be chosen by F01.00 function parameters and multi-function terminal:

Operation Panel: To control drive starting, stopping and inching by pressing the key **RUN, STOP, M** on the operation panel.

Control terminal: Control terminal controls the drive starting, stopping operational.

Modbus Communications port: Control the drive starting and stopping through the Modbus communication port

5.1.2 Control Mode

The frequency of the TI260 series drive is finally set by 11 main set channels (F00.01 settings) and 9 auxiliary setting channels (F00.03 set) which is obtained after a variety of operations (F00.06 definition).

Note: If auxiliary setting is the same as the main channel setting, then frequency follows the main channel setting.

Main set Frequency Channel

0: Digital setting (F00.00) + Operation panel▲/▼adjustment
1: Analog input AI1
2: Analog input AI2
3: Analog input AI3
4: X4/DI Pulse setting
5: Process PID
6: Simple PLC
7: Multistage speed
8: Communication given
9: Panel potentiometer
10: Local orthogonal pulse input
11: Local symbol pulse input

Auxiliary set frequency channel

0: None given
1: Digital given (F00.02) +▲/▼ adjustment
2: Analog input AI1
3: Analog input AI2
4: Analog input AI3
5: X4/DI Pulse setting
6: Process PID
7: Simple PLC
8: Multistage speed
9: Communication given

5.1.3 Drive working conditions

The working state of TI260 series VFD is divided into shutdown state, running state and Self-tuning state of motor parameters.

Downtime state: Drive will power on after initialization, if there is no run command input, or execute stop command during running, three-phase U/V/W terminals of the drive has no input and output, and operation panel lights RUN off

Running state: Once drive receives running commands, the three-phase U/V/W terminal begins output, and the operation panel state light is continuously lighting.

Motor parameter self-tuning state: Set the motor parameters to F10.00-F10.07. According to the motor's current state, F10.08 is selected to 2 as static self-tuning or 3 as rotary self-tuning.

The panel displays TUNE after confirmation, and the RUN key is entered into self-tuning state. It will be back to shutdown state after adjustment is completed.

5.1.4 Drive running mode

The running of TI260 series VFD can be divided into six parts: Jog running/point moving, process PID adjustment running, Multi speed running, simple PLC running, frequency swing running and general running.

Jog running/Point moving:

Under the control mode of the operation panel, presses M key and runs at jog frequency (need set F00.16).

Under the terminal control mode, the VFD receives multi-function terminals (#3 and #4 functions), and runs according to corresponding jog frequency and needs to set F00.16.

Process PID adjustment running:

Process PID adjustment running function is effectively (F00.01 = 5), the VFD will select process PID to adjust the running mode, that is, PID adjustment according to the setting and feedback volume to adjust PID (set F50 group function parameters). The multi function terminal (No. 41 function) can make the process PID adjust running mode invalid and switch to other running mode.

Multi speed running:

Multi speed adjustment running is effective (F00.01 = 7), through multi-function terminal (#19-22 function) logic combination, to select multi frequency 115 (F51.01-F51.15) to run at multi speed.

Simple PLC running:

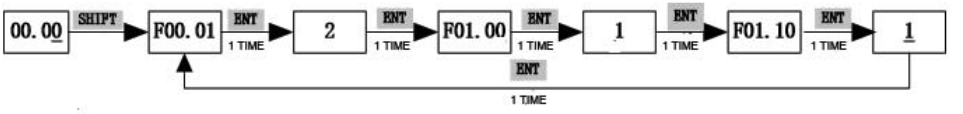
Simple PLC function selection is effective (F00.01 = 6), the VFD will run in a simple PLC mode, and the VFD will run according to the pre-set operation parameters (see F52 group function parameters). The simple PLC operation can be suspended through a multifunction terminal (No. 40 function)

Frequency swing running:

The swing frequency running function is effective (F53.00=1), and the drive will run according to the pre-set running parameters (see F53 group function parameters).

5.1.5 Checkout menu

Check non factory value parameters, such as setting frequency main giving mode F00.01=2, running command given mode F01.00=1, shutdown mode F01.10=1, shown as below:

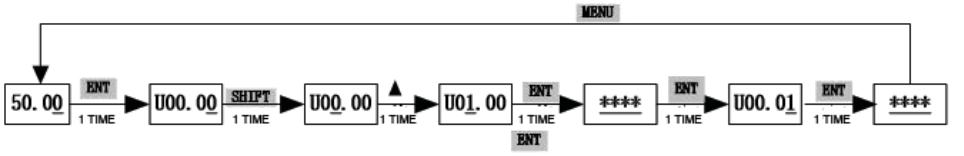


Under drive power-on state, press SHIFT key in 2S to enter non factory value parameter, it will display F00.01, press the upper and lower buttons to display the modified parameters, press ENT key to see the modified parameters, press the MENU key to return to the directory menu.

5.1.6 Monitor menu

Group U is the VFD monitoring parameter. We can see the current state of the drive through the U00 group. We can see the VFD failure parameters in the U01 group, and U02 group to see the parameters of the VFD software version information and so on.

When the VFD is in normal mode, press ENT button, the panel will display U00.00, the long arrow▲ and SHIFT to view the monitor group parameters, such as to check the drive failure record, operation following below process:



5.2 Operation guideline

5.2.1 Operator Panel instruction

LED operation panel is standard configuration of TI260 series drive, as shown in Figure 5-1

5-1 TI260 Series operation panel schematic

Symbol	Key Name	Function
MENU	Programming /Exit key	1. Enter or exit programming 2. To give up saving after modifying data. 3. After **SHIFT** key switch to displaying stop/running parameters, press MENU back to fault display status
ENT	Enter Key	1. Function code parameter editing. 2. Data saving confirmation 3. Single group parameter loop checking

Symbol	Key Name	Function
▲	UP Key	1. Function code serial number selected bit increase 2. Parameter data selected bit increase 3. Frequency value increase under stop/running state.
▼	DOWN Key	1. Function code serial number selected bit decrease 2. Parameter data selected bit decreases 3. Frequency value decrease under stop/running state.
SHIFT	Shift Key	1. Move function parameters editing bit. 2. Move data editing bit 3. Switch operation panel display parameters under stop/running state.
M	Multi-function Key	Please refer to table of " M "key function definition
RUN	Running Key	1. Under the given operation command of the operation panel, control the VFD to start 2. After setting the parameters self-tuning, start the VFD for parameters self-learning.
STOP/ RST	Stop/reset Key	1. Under given operation command of the operation panel, control drive to stop 2. Fault reset

5.2.2 Indicator light Instruction

Symbol		Name	Meaning	Color
Unit Light	Hz	Frequency indicator	ON: Current displayed parameters is running frequency Flash: current displayed parameter is set frequency	Green
	A	Current indicator	ON: currently displayed parameter is current	Green
	V	Voltage indicator	ON: currently displayed parameter is voltage	Green
	Hz+A	Speed indicator	ON: currently displayed parameter is revolving speed	Green
	A+V	Percentage	ON: currently displayed parameter is percentage	Green
	Hz+A +V	Time indicator	ON: currently displayed parameter is time	Green
		Non-unit indicator	OFF: currently displayed parameter is non-unit	Green
State Light	MON	Running command preset indicator	ON: Operation panel running commend preset mode OFF: Terminal running command preset mode Flash: Upper computer running commands preset mode	Green
	RUN	Running status indicator	ON: inverter is running OFF: inverter already stopped Flash: inverter is stopping	Green

	FWD	Forward/reverse indicator	ON: In running state, inverter is in forward direction OFF: In running state, inverter is in reverse direction	Green

5.2.3 Operation panel display status

Display status of TI260 series VFD's operation panel is devided into: stop parameter display status, operation parameter display status, function parameter edit and display status, fault alarm display status.

Stop parameter display status

When the drive is in running state, operation panel displays running state and parameters is shown in figure 5-2. Press SHIFT key, you can cyclicaly display different operation parameters (F40.06 - F40.11).

Operation parameters display status

When the drive is running, display running state and parameters of the operation panel is shown in Figure 5-3. Press SHIFT button, you can cyclicaly display different operating parameters (F40.00-F40.05)

5.2.4 Examples for how to use Operation Panel

Function parameter setting

For example, change function parameter H00.01 from 50.00 Hz to 48.00 Hz, as shown in figure 5-2.

5-2 Function parameter setting

5.2.5 Key locking and unlocking

F41.04 Key locking function selection

0: Unlocked

1: Fully locked **LOC1**

2: Locked except multifunction key **LOC2**

3: Locked except RUN and STOP key **LOC3**

Key locking function effective method

1, Press **MENU+▲** at the same time, press F41.04 to lock operation panel

2, The drive can be locked after the drive is reconnected.

3, The operation panel will be automatically locked if there is no operation in 5 minutes after setting the function code.

Key locking function relieving mode

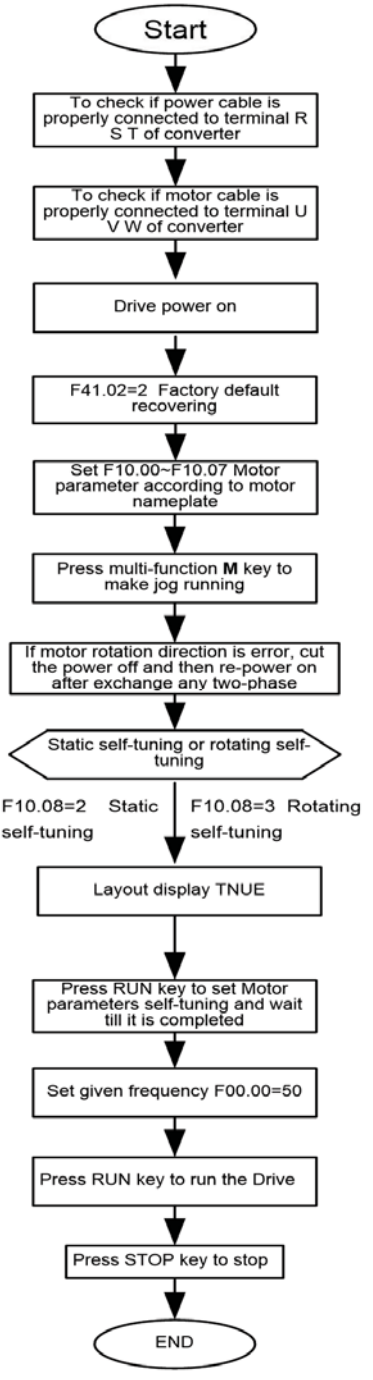
Press **MENU+▼** at the same time to unlock

5.3 First Powering on

Check the VFD before powering on, please follow technical requirements provided in the manual to wire and connect.

After insure that wiring and power supply checking is ok, please close air switch in the input side of AC power supply, power on the drive, and the drive begins to power on initialization, details please refer to figure 5-3.

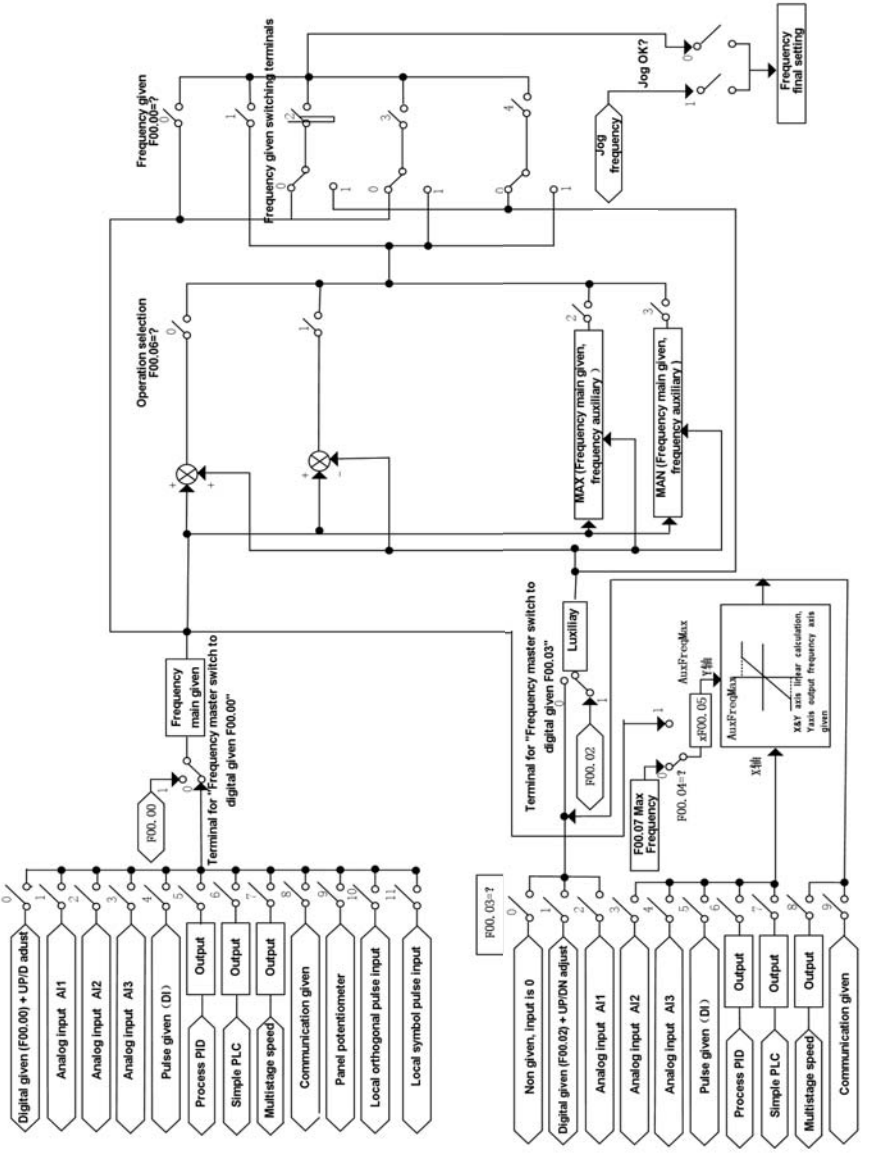
5-3 **First power-on flow diagram**


Start
To check if power cable is properly connected to terminal R S T of converter
To check if motor cable is properly connected to terminal U V W of converter
Drive power on
F41.02=2 Factory default recovering
Set F10.00~F10.07 Motor parameter according to motor nameplate
Press multi-function M key to make jog running
If motor rotation direction is error, cut the power off and then re-power on after exchange any two-phase
Static self-tuning or rotating self-tuning
F10.08=2 Static self-tuning
F10.08=3 Rotating self-tuning
Layout display TNUE
Press RUN key to set Motor parameters self-tuning and wait till it is completed
Set given frequency F00.00=50
Press RUN key to run the Drive
Press STOP key to stop
END

Chapter 6 Specified Function Introduction

6.1 F0 group: Basic parameters

6.1.1 F00 Frequency given



No.	Parameter description	Setting range	Factory value
F00.00	**Frequency main given number setting**	**0.00Hz—Upper Frequency**	**50.00Hz**
F00.01	**Frequency main given mode**	**0—11**	**0**
	0: Digital given (F00.00) +UP/DN adjustment The initial frequency setting value is F00.00, the value of "main frequency given digital set" can change Set frequency value of the drive through multiple switch UP/DN or ▲/▼. The current frequency auxiliary given value throuth inputing "UP" and "DN" when the VFD is running or in shutdown state. 1: Analog input AI1 2: Analog input AI2 AI1, AI2 has (0~10V) voltage input or (0~20mA) current input to select. The input of Voltage or current can be selected through switch of J500 and J501 jump lines on the control board. The corresponding relation between the analog value value and the frequency can refer to specific description of the function code F32.00~F32.20. Analog input automatic correction refers to group F34 function code. 3: Analog input AI3 AI3 is for -10V~+10V voltage input, positive&negative of voltage determines frequency's direction. Please refer to specific description of function code F32.00~F32.20 for the corresponding relationship between analog value and frequency. Please refer to group F34 function code for the automatic correction of analog input. When using 10V power supply inside the drive together with potentiometer, notice that the jump line switch must press the voltage input test at this time. 4: Pulse given(DI) The set frequency is determined by pulse frequency of terminal, and can only be input by DI terminal. DI terminal should be set as "pulse input" function, that is, F30.04 is set to 32, the corresponding relationship between the pulse frequency and the set frequency is shown in the F32.33~F32.37 function description. 5: Process PID Setting frequency is determined by the result of process closed loop PID operation; details please refer to F50 group function code. 6: Simple PLC Setting frequency is determined by simple PLC. Please refer to F52 group parameters. 7: Multistage speed To select multi frequency operation mode, need cooperate with multi-function input state combination of different X1~X6 terminals, to match different frequency setting value, TI260 can set 4 multi frequency command (terminal function 19 ~ 22), can be done through a combination of 16 different frequency settings, the related frequency set please refer to F51 parameter group. 8: Communication given Host the current master given frequency of the drive by the standard RS485 communication interface built in the drive Specific programming methods, operation methods, communication protocols and so on, please refer to F03 function code and appendix description. 9: Panel potentiometer 10: Local orthogonal pulse input 11: Local symbol pulse input		
F00.02	**Frequency assisted given number setting**	0.00Hz-Upper frequenc	**50.00Hz**
F00.03	**Frequency assisted given method**	**0—9**	**0**

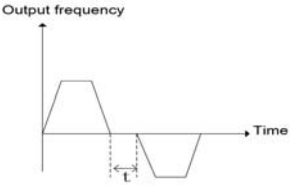
No.	Parameter description	Setting range	Factory value
	0: Non given The frequency is invalid, the auxiliary frequency is 0 1: Take F00.02 value directly as auxiliary frequency given when Drive is powering-on, you can change currentl frequency auxiliary given value by switching input UP/DN or ▲/▼ when drive is running or in stopping state. UP/DN frequency regulation control mode and frequency adjustment step are set by F41.07 and F41.08. **Note:** when the frequency master is UP/DN in a given way, the terminal UP/DN adjustment in the frequency assisted given mode is invalid. 2: Analog input AI1 3: Analog input AI2 4: Analog input AI3 AI1 and AI2 has (0~10V) voltage input or (0~20mA) current input. AI1 and AI2 switch on control board determines whether the analog channel is voltage input or current input. AI3 is -10V~+10V voltage input, the positive and negative of voltage determines the direction of set frequency. **Note:** Frequency relationship of frequency main give maximum value of analog input, please refer to the F00.04 and F00.05 function instructions. 5: Pulse setting(DI) The value of frequency transmission is determined by terminal pulse frequency. It can only be input by DI terminal. At this time, the DI terminal needs set as "pulse input", and the F30.04 need set to 32. The corresponding relation between pulse frequency and set frequency can be seen in the F32.33~F32.36 function description. **Note:** Frequency relationship of frequency main give maximum value of pulse input, please refer to the F00.04 and F00.05 function instructions. 6: Process PID The given value of frequency is determined by the result of process PID operation, please refer to F50 group function code. **Note:** Frequency related to the frequency of PID output maximum value corresponding to the frequency relationship please refer to the F00.04, F00.05 function description. 7: Simple PLC Frequency auxiliary given value is determined simple PLC. Please refer to F52 group function code. 8: Multistage speed Through combination of "multi frequency terminal 1~4", total 16 segments can be set up, and states between operation and downtime can exchange through multiple frequency terminals. 9: Communication given To set current main given frequency of the drive throught standard RS485 communication interface built in the drive. Specific programming methods, operation methods, communication protocols and so on, please refer to F03 function code and appendix description.		
F00.04	**Reference selection for frequency transmission**	**0－1**	**0**
	0: Relative maximum frequency 1: Relative frequency master given		
F00.05	**Frequency given coefficient**	**0.0%－200%**	**100%**
F00.06	**Frequency main auxiliary superposition selection**	**00－134**	**100**

No.	Parameter description	Setting range	Factory value
	Single bit: frequency given 0: frequency master given 1: Frequency main auxiliary given operation result 2: Frequency master given and frequency assisted switching 3: Frequency master given and main-auxiliary operation results switching 4: Frequency assisted givenand main-auxiliary operation results switching 10 bits: a given operation relationship of frequency main and auxiliary 0: Main + auxiliary 1: main - auxiliary 2: Max {master, auxiliary} 3: Min {master, auxiliary} 100 bits: frequency main and auxiliary operation symbol limit 0: null and void 1: Validated		
F00.07	**Maximum frequency**	**Upper frequency－300.00Hz**	**50.00Hz**
	The maximum frequency the drive allows for output is defined. It should be set carefully and reasonably according to nameplate parameters of the controlled motor and operating conditions of actual machinery.		
F00.08	**Upper bound frequency**	**Upper frequency -maximum frequency**	**50.00Hz**
	F00.08 is used to limit the maximum frequency of actual output of a drive		
F00.09	**Lower frequency**	**0.00-Upper frequency**	**0.00Hz**
	F00.09 is used to limit the actual output frequency value • It should be carefully and reasonably set up on the basis of nameplate parameters of controlled motor and actual operating conditions. • It is not valid for auto tuning of motor parameters. • In addition to upper / lower limit frequency, the output frequency of VFD is also limited by starting frequency, stopping DC braking frequency and jumping frequency.		
F00.10	**Jump frequency 1**	**0.00Hz－Upper frequency**	**0.00Hz**
F00.11	**Jumping range 1**	**0.00Hz－30.00Hz**	**0.00Hz**
F00.12	**Jump frequency 2**	**0.00Hz－Upper frequency**	**0.00Hz**
F00.13	**Jumping range 2**	**0.00Hz－30.00Hz**	**0.00Hz**
F00.14	**Jump frequency 3**	**0.00Hz－Upper frequency**	**0.00Hz**
F00.15	**Jumping range 3**	**0.00Hz－30.00Hz**	**0.00Hz**
	Jump frequency is set to allow output frequency of drive to avoid resonant frequency point of mechanical load. • VFD's setting frequency can be leaped near some frequency points as shown in the graphic. . In acceleration and deceleration		

No.	Parameter description	Setting range	Factory value
	process, acceleration and deceleration operation is carried out through jump frequency zone in a continuous output frequency mode, but it can not stay at constant speed of jump frequency zone. • Frequency setting is hopping and frequency output is continuous.		
F00.16	**Point moving frequency setting**	**0.00Hz—Upper frequency**	**5.00Hz**
	F00.17 determines the frequency set value at the point of movement.		

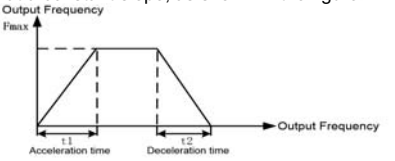
6.1.2 F01 Start and stop control

No.	Parameter description	Setting range	Factory value
F01.00	**Run command given mode**	**0—3**	**0**
	0: Operation panel command mode (MON lighting-on) Start, stop, positive / reverse control can be controlled through RUN, STOP, and M keys on operation panel. 1: Terminal command mode (MON lighting-off) To start, stop, positive / reverse control the drive through corresponding external multi-function terminals, details refer to F30.00~F30.07, F30.16 parameters. 2: Communication command mode (MON flashing) To start, stop, positive / reverse control the drive by the way of communication protocol. 3: Multi segment command mode (MON lighting-on) Multi segment speed terminal can control the VFD when multi segment speed frequency is selected.		
F01.01	**Command given mode bundled frequency source**	**000—999**	**000**
	Single digit: panel command binding frequency source selection 10 bits: terminal command binding frequency source selection 100 bits: communication command binding frequency source selection 0: non binding 1: digital given (F00.00) +UP/DN regulation 2: analog input AI1 3: analog input AI2 4: analog input AI3 5: pulse setting (DI) 6: process PID 7: simple PLC 8: multistage speed 9: Communication given		
F01.02	**Running direction selection**	**0—1**	**0**
	0: the same direction 1: reverse direction		
F01.03	**Anti reversal selection**	**0—1**	**0**
	0: allowable reversal 1: Prohibition of reversal		

No.	Parameter description	Setting range	Factory value
	In some cases where motor reversals are prohibited, the motor can be prohibited from reversing the motor by this function code, and the parameter factory acquiescence is allowed to reverse.		
F01.04	**Positive reverse dead Time**	**0.0s－3600.0s**	**0.0s**
	When transition from forward running to reverse one, or from reverse running to forward one, the drive output zero frequency transition time, as shown as “t” in the graphic. 		
F01.05	**Starting mode selectiong**	**0—3**	**0**
	0: starting from starting frequency The drive receives the run command, first runs to F01.06 "start frequency" and maintains the F01.07 "start frequency retention time", and then speeds up to the set frequency. 1: first braking and starting from starting frequency First, the DC excitation is applied to the motor. The magnitude and time of DC braking current are set by F01.09 and F01.10, and then start from the starting frequency, and then accelerate to the set frequency after starting and holding time. 2: first tracking and then starting from the search frequency (software) 3: first tracking and then starting from the search frequency (hardware)		
F01.06	**Starting frequency**	0.00Hz－Upper frequency	**0.50Hz**
F01.07	**Starting frequency retention time**	**0.0s—6000.0s**	**0.0s**
	VFD starts from F01.06 "starting frequency", and then starts to run after F01.07 "starts and hold the time". **Note: For heavy load cases, the appropriate increase of set value of F01.07 and F01.08, which is beneficial to start running of the VFD.**		
F01.08	**Starting DC brake current**	**0.0s~100.0%**	**0.0%**
F01.09	**Starting DC braking time**	**0.00s~30.00s**	**0.00s**
	F01.08 sets current size of starting DC brake, which is percentage of rated current value of the relative drive. F01.09 starts DC brake action time.		
F01.10	**Shutdown mode selection**	**0—2**	**0**
	0: Decelerations stop (deceleration to shutdown frequency and stop after setting time). After shutdown command is effective, the VFD decreases output frequency according to set deceleration time, slows down to downtime frequency and maintains set time, and then stops. 1: free stop After the drive receives stop command, the output is closed immediately, and the motor is stopped in accordance with mechanical inertia. 2: deceleration stop + DC brake After the drive receives the shutdown command, the output frequency is reduced according to deceleration time. When the frequency is set to the F01.11, DC brake is started.		
F01.11	**Stop DC brake Start frequency**	**0.00Hz—Upper frequency**	**0.50Hz**
F01.12	**Stop DC brake current**	**0.0%—100.0%**	**0.0%**
F01.13	**Stop DC braking time**	**0.00s—30.00s**	**0.00s**
	F01.11 "start frequency of shutdown DC brake": in process of slowing down, when frequency of		

No.	Parameter description	Setting range	Factory value
	output is reduced to this frequency, the process of DC braking begins. F01.12 "stop the DC braking current": when decelerating to the DC braking frequency, the VFD first seals off the output for a period of time, then starts injecting DC to DC brake. F01.13 "shutdown DC braking time": the duration of direct current braking is injected into the DC.		
F01.14	**Frequency multiplying rate for speed tracking**	**50.0%—150.0%**	**100.0%**
F01.15	**Minimum interval time for speed tracking**	**0.1s—20.0s**	**3.0s**

6.1.3 F02 Acceleration and deceleration parameters

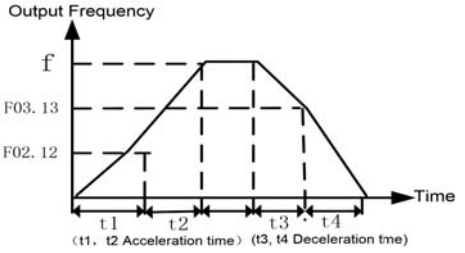
No.	Parameter description	Setting range	Factory value
F02.00	**Acceleration time 1**	**0.1—6000.0s**	**Model determination**
F02.01	**Deceleration time 1**	**0.1—6000.0s**	**Model determination**
F02.02	**Acceleration time 2**	**0.1—6000.0s**	**Model determination**
F02.03	**Deceleration time 2**	**0.1—6000.0s**	**Model determination**
F02.04	**Acceleration time 3**	**0.1—6000.0s**	**Model determination**
F02.05	**Deceleration time 3**	**0.1—6000.0s**	**Model determination**
F02.06	**Acceleration time 4**	**0.1—6000.0s**	**Model determination**
F02.07	**Deceleration time 4**	**0.1—6000.0s**	**Model determination**
	Acceleration time is the time required to speed up the drive from zero frequency to F00.07 (maximum output frequency) in a straight line. Deceleration time: the time it takes to reduce the drive from F00.07 (maximum output frequency) to zero frequency in a straight line. **Note: four groups of acceleration and deceleration time can be switched by the F30 multifunction input terminal "14" and "15" function combination mode.**		
F02.08	**Emergency shutdown time**	**0.1—6000.0s**	**6.0s**
	When switch volume input No. 9 function "emergency stop" terminal is stopped, slow down at this time. This time required for the drive to decelerate from maximum frequency F00.07 to zero frequency.		
F02.09	**Point motion acceleration time**	**0.1—6000.0s**	**6.0s**
F02.10	**Point moving deceleration time**	**0.1—6000.0s**	**6.0s**
	F02.09 and F02.10 are used to set up and decelerate time of point moving		
F02.11	**Acceleration &deceleration curve Selection**	**0—3**	**0**
	0: linear acceleration and deceleration The output frequency increases or decreases at a constant slope, as shown in the figure.  Fmax means maximum frequency F00.07. 1: Fold line Acceleration and deceleration In the process of acceleration and deceleration, the acceleration and deceleration time can be automatically switched on the basis of the output frequency, as shown in the diagram. F02.00 (acceleration time 1) is used when the output frequency of acceleration and deceleration is equal to or equal to F02.12 (fold and deceleration acceleration time switching frequency). F02.02 (acceleration time 2) is used when the frequency is less than this frequency.		

No.	Parameter description	Setting range	Factory value

When the output frequency of deceleration is equal to or equal to F02.13 (fold and deceleration time switching frequency), F02.01 (deceleration time 1) is used.

F02.03 (deceleration time 2) is used when the frequency is less than this frequency.

Note: when the line acceleration is selected, the switch quantity input "acceleration and deceleration time selection 1" and "acceleration and deceleration time selection 2" terminal are invalid.



t1=(F02.02)×(F02.12)/(F00.07) t2=(F02.00)×[F-(F02.12)]/(F00.07)

t3=(F02.01)×[F(F02.13)]/(F00.07) t3=(F02.03)×(F03.13)/(F00.07)

F is current set frequency, and F00.07 is maximum frequency.

2: Curve acceleration and deceleration

The increase of a curve and deceleration time in the beginning and end of the acceleration and deceleration can improve the smoothness during the lifting and stopping process and prevent the impact of the load of the transport machinery.

- The shape of the curve plus deceleration can be independently set up and decelerated. And the slope of the beginning and the deceleration of the curve, the curvature of the curve at the arriving part, and the slope of the middle part of the curve and deceleration can be set separately. F02.14 ~ F02.16 is the setting for acceleration, and F02.17 ~ F02.19 is the setting for deceleration. The following method is described, since the same method is used for acceleration and deceleration, so only the setting method for acceleration is illustrated.

F02.14=0 - 200% (1% step): the curvature of the curve that specifies the acceleration of the acceleration and deceleration of the curve.

If it is set to 0, the first part is accelerated in a straight line, and if it is set to 200, the curvature becomes the largest.

F02.15=0 ~ 200% (1% step): the curvature of the curve of the curve which is accelerated to the part of the acceleration and deceleration of the curve.

If set to 0, then the reach is a straight line acceleration, and if the set is 200, the curvature becomes maximum.

F02.16=0 ~ 100% (1% step): setting the slope of the intermediate part of the acceleration and deceleration of the curve.

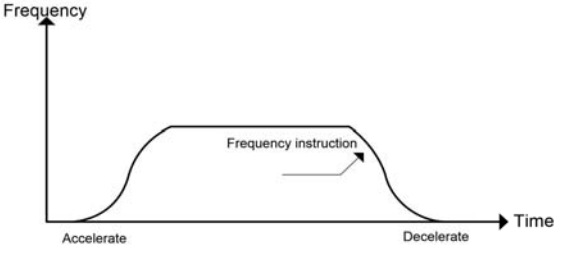
If set to 0, the slope is set by the linear acceleration time, and if the set is set 100, it becomes a slope of 2 times the slope set by the linear acceleration time.

- In the case of changing the set value of the curve plus deceleration, the new set value becomes effective from the beginning of the next acceleration and deceleration.

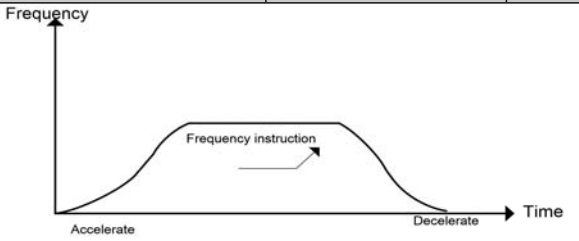
- In the case of curve plus deceleration, the time of arrival of the frequency varies with the set value of F02.14 ~F02.19. For the arrival time. The formula for the calculation is as follows

$$Ts = \frac{T}{2}\left(\frac{200}{100 + \text{S Intermediate slope}} + \frac{\text{S start curve +S arrival curve}}{200}\right)$$

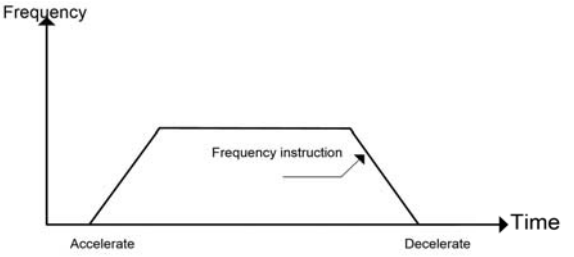
Ts: time of arrival (second) when the curve is added and decelerated.

No.	Parameter description	Setting range	Factory value
	T: Time of arrival (second) for the set value of F02.00 to F02.07 in a linear plus deceleration mode. The starting curve of the curve plus deceleration: the set value of F02.14 and F02.17 (%). The curve of arrival and deceleration of the arrival curve: the set value of F02.15 and F02.18 (%). The intermediate slope of the curve plus deceleration: the set value of F02.16 and F02.19 (%). Example: from 20Hz to 50Hz acceleration, F02.00=5 (second): acceleration time set value. F02.14=50 (%): the beginning of the part is the middle degree of curvature of the S word. F02.15=50 (%): the S word that reaches the partial curvature of the middle degree. F02.16=0 (%): the slope of the middle part is the same as that of the straight line. $T = \frac{5\text{s}}{50\text{Hz}} \times \left(50\text{Hz} - 20\text{Hz}\right) = 3\text{s}$ $Ts = \frac{3\text{s}}{2} \times \left(\frac{200}{100+0} + \frac{50+50}{200} \right) = 3.75\text{s}$ The following is an example of the S character curve based on the set value. It is the same case that both the acceleration and deceleration time and the setting value of the acceleration and deceleration time are set. F00.07=50 (Hz) F02.00=5 (SEC) F02.01=5 (SEC) Example 1) F02.14=100 F02.15=100 F02.16=100 F02.17=100 F02.18=100 F02.19=100 The arrival time is equal to the time of arrival and deceleration of the straight line. However, because the slope of the middle part is 2 times that of the linear plus deceleration mode, the current limiting current function is carried out according to the inertia of the load device.  Example 2) F02.14=100 F02.15=100 F02.16=100 F02.17=100 F02.18=100 F02.19=0 S deceleration begins and at the part of the curvature becomes maximum, S font with the middle part of the slope reduction becomes the same way with the linear acceleration and deceleration.		

No.	Parameter description	Setting range	Factory value

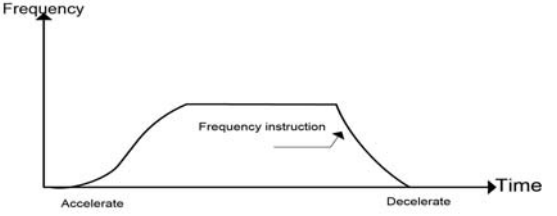


Example 3) the result of F02.14=0 F02.15=0 F02.16=0 F02.17=0 F02.18=0 F02.19=0 becomes the same as the linear acceleration method



Example 4) F02.14=100 F02.15=0 F02.16=0 F02.17=0 F02.18=0 F02.19=0

This set value is applicable to additive and deceleration of square reduction torque load of fan and the like.



Attention: in the use of S words and deceleration occasions

① on the occasion of changing the setting value of the frequency in the S word plus deceleration, the new frequency setting is reproduced and decelerated from the beginning of the S. For this reason, the change of the actual output frequency at the beginning of changing the frequency is not a curved and smooth curve.

② F00.01 is set to 1~3. When frequency is set from the external analog signal, the analog signal is overlapped with influence of interference components and ripple components. Therefore, in this situation, the change of actual output frequency also has no smooth curve because of the reason.

③ In S word acceleration and deceleration, when the frequency lock-in (when the external terminal is running, and simultaneously input the forward and reverse signal), the output frequency will remain fixed at a certain time point. In the time point of the release of the frequency, the addition or deceleration of the original S word is changed to the change of

No.	Parameter description	Setting range	Factory value
	the remaining frequency. ④ The change of acceleration and deceleration time (F02.00 to F02.07) in the S word acceleration and deceleration begins to become effective from the next acceleration and deceleration. Similarly, when switching to other acceleration and deceleration (second acceleration and deceleration) of external control terminals from acceleration and deceleration, it is also effective from the next acceleration and deceleration. ⑤ In the case of S acceleration and deceleration, the residual acceleration and deceleration is changed into a straight line acceleration and deceleration, and the deceleration is performed. ⑥ The acceleration and deceleration of the current limiting function at the time of stability is carried out by a linear acceleration and deceleration curve. ⑦ The acceleration and deceleration of the point moving is also S character acceleration deceleration		
F02.12	**Speed switching frequency of folding and decelerating**	0.00Hz－Upper frequency	**0.00Hz**
F02.13	**Folding and decelerating deceleration time Switching Frequency**	0.00Hz－Upper frequency	**0.00Hz**
F02.14	**Accelerate start curvature rate**	0%－100%(Curve acceleration& deceleration)	**50%**
F02.15	**Speed up ending curvature rate**	0%－100%(Curve acceleration& deceleration)	**50%**
F02.16	**Accelerating intermediate slope rate**	0%－100%(Curve acceleration& deceleration)	**0%**
F02.17	**Deceleration start curvature rate**	0%－100%(Curve acceleration& deceleration)	**50%**
F02.18	**Deceleration ending curvature rate**	0%－100%(Curve acceleration& deceleration)	**50%**
F02.19	**Deceleration intermediate slope rate**	0%－100%(Curve acceleration& deceleration)	**0%**

6.1.4 F03 Communication parameters

No.	Parameter description	Setting range	Factory value
F03.00	**Local address**	**000－247**	**001**
	0 is the broadcast address, and the available address is 1~247.		
F03.01	**Baud rate Selection**	**000－555**	**311**
	Single bit: communication port baud rate selection 10 bits: communication baud rate selection for extended port communication 100 bits: the choice of the communication baud rate of the keyboard port 0: 4800bps 1: 9600bps 2: 19200bps 3: 38400bps 4: 57600bps 5: 115200bps		

No.	Parameter description	Setting range	Factory value
F03.02	**Data format**	**000－555**	**000**
	Single digits: data format selection of communication port 10 bits: extension data format selection 100 bits: the selection of the data format of the keyboard 0: 1-8-1-N format,RTU 1: 1-8-1-E format,RTU 2: 1-8-1-O format,RTU 3: 1-7-1-N format,ASCII 4: 1-7-1-E format,ASCII 5: 1-7-1-O format,ASCII		
F03.03	**Local response delay**	**0.000s~60.000s**	**0.000s**
F03.04	**Communication timeout detection time**	**0.0s－3600.0s**	**0.0s**
	0.0s: no detection of communication timeout		
F03.05	**Communication error response shielding selection**	**000-111**	**000**
	Single bit: communication port error response shielding selection 10 bits: screening selection for extended mouth error response 100 bits: keyboard mouth error response shielding selection 0: null and void 1: effective		
F03.06	**Selection of master and slave mode and selection of slave function code**	**0000－1122**	**0000**
	Single bit: the master and slave of the communication port 10 bits: primary and subordinate selection of the extended mouth 0: single machine use 1: This machine is used as the host 2: This machine is used as a slave machine 100 bits: the selection of the operating object of the communication port 1000 bits: selection of extended port operating object 0:F00.00 1:F50.01		
F03.07	**Host operating dependent machine interval time**	**0.010s－1.000s**	**0.050s**
F03.08	**Frequency ratio coefficient of dependent machine**	**0.00－10.00**	**1.00**
F03.09	**Special function of communication**	**0000－4111**	**0001**
	Single bit: EEPROM write enable 0: null and void 1: effective 10 bits: Custom address enabled 0: null and void 1: effective 100 bits: oscilloscope is mapped to the terminal 0: null and void 1: effective Thousands digits: oscilloscope monitoring		

No.	Parameter description	Setting range	Factory value
	0: monitoring closure 1: monitoring definition 2: monitoring function 3: monitoring performance 4: protocol communication		
F03.10	**Oscillograph monitoring item**	**0000-FFFF**	**7543**
	Single bit: CH1 monitoring item selection 10 bits: CH2 monitoring item selection 100 bits: CH3 monitoring item selection 1000 bits: CH4 monitoring item selection 0: the default output is zero 1:M axis feedback current (unit: Q12) 2:T axis feedback current (unit: Q12) 3:U phase output current (unit: Q12) 4:V phase output current (unit: Q12) 5:W phase output current (unit: Q12) 6: effective output current (unit: Q12) 7: DC bus voltage (unit: 0.1V) 8: actual output voltage (unit: 0.1V) 9: given output frequency (unit:0.01Hz) A: ramp output frequency (unit:0.01Hz) B: actual output frequency (unit:0.01Hz) C: synchronous output frequency (unit:0.01Hz) D: the actual frequency of the rotor (unit:0.01Hz) E: feedback output torque (unit: 0.1%) F: given output torque (unit: 0.1%)		
F03.11	**Arbitrary definition of address 01**	**0x0000 -- 0xFFFF**	**0x0000**
F03.12	**Local corresponding address 01**	**0x0000 -- 0xFFFF**	**0x0000**
F03.13	**Arbitrary definition of address 02**	**0x0000 -- 0xFFFF**	**0x0000**
F03.14	**Local corresponding address 02**	**0x0000 -- 0xFFFF**	**0x0000**
F03.15	**Arbitrary definition of address 03**	**0x0000 -- 0xFFFF**	**0x0000**
F03.16	**Local corresponding address 03**	**0x0000 -- 0xFFFF**	**0x0000**
F03.17	**Arbitrary definition of address 04**	**0x0000 -- 0xFFFF**	**0x0000**
F03.18	**Local corresponding address 04**	**0x0000 -- 0xFFFF**	**0x0000**
F03.19	**Arbitrary definition of address 05**	**0x0000 -- 0xFFFF**	**0x0000**
F03.20	**Local corresponding address 05**	**0x0000 -- 0xFFFF**	**0x0000**
F03.21	**Arbitrary definition of address 06**	**0x0000 -- 0xFFFF**	**0x0000**
F03.22	**Local corresponding address 06**	**0x0000 -- 0xFFFF**	**0x0000**
F03.23	**Arbitrary definition of address 07**	**0x0000 -- 0xFFFF**	**0x0000**
F03.24	**Local corresponding address 07**	**0x0000 -- 0xFFFF**	**0x0000**
F03.25	**Arbitrary definition of address 08**	**0x0000 -- 0xFFFF**	**0x0000**
F03.26	**Local corresponding address 08**	**0x0000 -- 0xFFFF**	**0x0000**
F03.27	**Arbitrary definition of address 09**	**0x0000 -- 0xFFFF**	**0x0000**
F03.28	**Local corresponding address 09**	**0x0000 -- 0xFFFF**	**0x0000**
F03.29	**Arbitrary definition of address 10**	**0x0000 -- 0xFFFF**	**0x0000**
F03.30	**Local corresponding address 10**	**0x0000 -- 0xFFFF**	**0x0000**

No.	Parameter description	Setting range	Factory value
	When host computer exchanges with frequency inverter, the data address and VFD address issued by host computer can not be carried out at the same time. F03.09 ten bits can be set to 1, the opening custom address function is open. For example, when computer reads output current of the drive, the data address is 0xABCD, and the VFD's output current data address is 0x810C. At this point, F03.11 is set to 0xABCD, F03.12 is set to 0x810C, F03.09 ten bits is set to 1, and host computer can read current output current of the drive. 10 sets of data can be mapped at most.		

6.1.5 F04 Protection parameters

No.	Parameter description	Setting range	Factory value
F04.00	**Motor overheating output selection**	**000－111**	**000**
	Single bit: motor over temperature protection 0: prohibition 1: action 10 bits: sensor type 0: temperature sensor PT100 1: temperature sensor PT1000 100 bits: analog channel 0: analog input AI1 1: analog input AI2 When AI1 and AI2 are used as input of temperature sampling, current mode needs to be selected.		
F04.01	**Motor overheating output level**	**0.0－200.0℃**	**85.0℃**
F04.02	**VFD overload forecast alarm detection selection**	**000－111**	**000**
	Single bit: overload warning detection selection 0: it has been tested during the operation 1: test only at constant speed 10 bits: selection of detectable amount of overload warning 0: the detection level is relative to the rated current of the motor (alarm: motor overload) 1: detection level relative to drive rated current (alarm: drive overload) 100 bits: overload protection selection 0: overload protection shielding 1: overload protection enabling		
F04.03	**VFD overload forecast detection level**	**20.0%－200.0%**	**160.0%**
	The level of overload forecast alarm is current threshold of overload forecast. When ten bit selection of F04.02 is 0, setting value is relative to percentage of rated current of the motor. When the ten bit of F04.02 is 1, setting value is relative to percentage of the rated current of the VFD.		
F04.04	**Drive overload warning detection time**	**0.0s－60.0s**	**5.0s**
	Set drive output current is greater than overload alarm detection level (F04.03) duration		
F04.05	**Drive out load detection selection**	**0-4**	**0**
	0: the output number of the drive is invalid. 1: run all the time (warning) 2: only constant speed detection (warning) 3: Inspection (fault) in operation 4: only at constant speed (fault)		
F04.06	**Drive output load drop detection level**	**0.0%-100.0%**	**30.0%**

No.	Parameter description	Setting range	Factory value
F04.07	Drive out load detection time	0.0s—3600.0s	1.0s
F04.08	Automatic reset times	0—100	000
	0: no automatic reset function		
F04.09	Automatic reset time interval	0.1s—100.0s	1.0s
F04.10	Fault relay action selection	00—11	00
	Single bit: automatic reset period 0: no action 1: action If a failure is set, the relay will act when it is in an automatic reset state. 10 bits: undervoltage period 0: no action 1: action If the fault relay is operated if the undervoltage is under set.		
F04.11	Enhanced protection enabled selection	0000-1111	0000
	Single bit: output phase detection 0: prohibition 1: action 10 bits: inputting phase detection 0: prohibition 1: action 100 bits: motor overload detection 0: prohibition 1: action 1000 bits: detection of ground short circuit 0: prohibition 1: action		
F04.12	Cooling fan Control selection	0-2	0
	0: automatic operation 1: direct operation after power supply 2: stop immediately after shutdown		
F04.13	Fault record latch	0-1	1
	0: fault record reset when power off 1: fault record storage for power down		
F04.14	Fault protection action selection 1	0000-1111	1111
	Single bit: EEPROM reading and writing failure 0: continue to run 1: free parking 10 bits: sensitive signal failure 0: continue to run 1: free parking 100 bits: contactor suction failure 0: continue to run 1: free parking 1000 bits: current detection fault 0: continue to run		

No.	Parameter description	Setting range	Factory value
	1: free parking		
F04.15	**Fault protection action selection 2**	**0000-1111**	**1111**
	10 bits: drive overheating 0: continue to run 1: free parking 10 bits: encoder failure 0: continue to run 1: free parking 100 bits: motor overheating 0: continue to run 1: free parking 1000 bits: undefined system 0: continue to run 1: free parking		

6.1.6 F05 Enhanced functional parameters

No.	Parameter description	Setting range	Factory value
F05.00	**Carrier frequency setting**	**1.0—16kHz**	**Model determination**
	<=15KW: 1.0kHz—16.0kHz,Factory value: 8.0kHz 18.5KW—45KW: 1.0kHz—10.0kHz,Factory value: 4.0kHz 55KW—75KW 1.0kHz—8.0kHz,Factory value: 3.0kHz >=90KW: 1.0kHz—3.0kHz,Factory value: 2.0kHz		
F05.01	**Carrier frequency options**	**000—11F**	**000**
	Single bit: carrier frequency with noise adjustment coefficient Range: 0F 10 bits: the carrier frequency is adjusted with temperature 0: automatic adjustment 1: no adjustment 100 bits: carrier frequency adjustment with frequency 0: automatic adjustment 1: no adjustment		
F05.02	**PWM optimization**	**0000—1112**	**1000**
	Single bit: PWM modulation mode 0: three phase modulation 1: two phase modulation 2: automatic switching 10 bits: over modulation regulation 0: action 1: null and void 100 bits: current limiting mode 0: action 1: null and void		

No.	Parameter description	Setting range	Factory value
	1000 bits: narrow pulse regulation 0: action 1: null and void		
F05.03	**Over excitation brake selection**	**0—1**	**1**
	0: prohibition 1: action When deceleration is stopped, the excitation braking action is selected, and the power generation in the deceleration process can be converted to heat energy by increasing the flux of motor, so as to achieve the purpose of rapid deceleration. When this function is selected, the deceleration time is short, but the running current is slightly larger. If the over excitation brake is not operated, the motor slow down current is small, but the deceleration time becomes longer.		
F05.04	**Energy consumption braking Selection**	**0—1**	**0**
	0: prohibition 1: action Energy consumption braking is a kind of braking mode which can convert power generation amount in deceleration process into thermal energy of brake resistance, and thus realize rapid deceleration. It is suitable for large inertia load or fast braking. At this time, appropriate brake resistance and brake unit are selected, 22KW and the following power level are marked with the brake unit, and 30KW~110KW brake unit is built in.		
F05.05	**Braking action voltage of energy consumption**	**650V—750V**	**720V**
F05.06	**Overvoltage stall selection**	**0—1**	**1**
	0: prohibition 1: action When the motor is loaded with large inertia, it will cause energy to be fed back to the VFD during the deceleration operation or short term regenerative braking in operation, which will cause the DC bus voltage of the inverter to rise, resulting in overvoltage protection. The overvoltage stall function is compared with the overvoltage stall protection voltage set by F05.07 by detecting the bus voltage. If this value is exceeded, the output frequency of the VFD is adjusted instantaneously, and the deceleration time is extended automatically, so as to control the stability of the DC bus voltage. When the overvoltage stall function is selected, the instantaneous output frequency of the VFD may appear short time fluctuation and the deceleration time will be extended automatically. Therefore, please choose this function carefully in cases where frequency fluctuation is not allowed or deceleration time changes.		
F05.07	**Overvoltage stall voltage**	**100.0%—150.0%**	**135.0%**
	120.0%~150.0% (rated voltage) When **F05.06** selection is 1, if DC bus voltage exceeds this set value, output frequency is automatically adjusted to extend deceleration time. This voltage is relative to the standard DC bus voltage		
F05.08	**Undervoltage stall selection**	**0—1**	**0**
	0: prohibition 1: action The undervoltage stall function is to reduce the output frequency appropriately, and to compensate the DC bus voltage reduction through the load energy feedback to the VFD under transient undervoltage or instantaneous power failure, so as to maintain the continuous and non tripping		

No.	Parameter description	Setting range	Factory value
	operation of the VFD in a short time. Suitable for fans, centrifuges and other applications.		
F05.09	**Undervoltage stall voltage**	**50.0%—95.0%**	**85.0%**
	50.0%－95.0% (Rated bus voltage)50.0%~95.0% (rated voltage)		
F05.10	**Automatic current limiter action selection**	**0—1**	**1**
	0: prohibition 1: action		
F05.11	**Automatic limit flow limit level**	**20.0%—200.0%**	**160.0%**
	20.0%－200.0% (rated current machine)		
F05.12	**Automatic limit pressure coefficient adjustment**	**0—1**	**0**
	0: prohibition 1: action		
F05.13	**Special function selection**	**0—1**	**0**
	0: standard function 1: oil pumping unit function		
F05.16	**High frequency selection**	**0—1**	**0**
	0: 0~300HZ 1: 0~3200HZ		
F05.17	**Over fundamental frequency suppression**	**0-1**	**0**
	0: prohibition 1: action		

6.2 Group F1 Motor parameters

6.2.1 F10 Basic motor parameters

No.	Parameter description	Setting range	Factory value
F10.00	**Selection of motor type**	**0**	**0**
	0: asynchronous motor		
F10.01	**Motor control mode**	**0—2**	**0**
	0: simple vector control 1: no PG vector control 2: PG vector control		
F10.02	**Motor rated power**	**0.2kW—6000.0kW**	**Model determination**
F10.03	**Motor rated voltage**	**1V—480V**	**380V**
F10.04	**Motor rated current**	**0.1A—6000.0A**	**Model determination**
F10.05	**Motor rated frequency**	**10.00Hz—Max. frequency**	**50.00Hz**
F10.06	**Motor rated speed**	**1—65535 rpm**	**1500rpm**
F10.07	**Motor pole number**	**2—80**	**4**
	For 2-80 only asynchronous motor is effective. Either asynchronous motor or synchronous motor, the above motor parameters must be set up correctly according to the motor nameplate. Please select the motor that matches the power level of the drive, otherwise the control performance of the VFD will decline obviously.		
F10.08	**Auto/Self tuning of motor parameters**	**0-3**	**0**
	0: no action		

No.	Parameter description	Setting range	Factory value
	1: self tuning of current balance coefficient 2: static self-tuning of asynchronous motor 3: rotation self-tuning of asynchronous motor		

6.2.2 F11 Asynchronous motor parameters

No.	Parameter description	Setting range	Factory value
F11.00	Stator resistance of asynchronous motor	0.000Ω－65.000Ω	Model determination
F11.01	Rotor resistance of asynchronous motor	0.001Ω－65.000Ω	Model determination
F11.02	Asynchronous motor leakage inductance	0.0mH－6500.0mH	Model determination
F11.03	Induction motor mutual inductance	0.1mH－6500.0mH	Model determination
F11.04	No-load excitation current of asynchronous motor	0.1A－6000.0A	Model determination
F11.05	Magnetic saturation coefficient of asynchronous motor 1	0.00%－100.00%	Model determination
F11.06	Magnetic saturation coefficient of asynchronous motor 2	0.00%－100.00%	Model determination
F11.07	Magnetic saturation coefficient of asynchronous motor 3	0.00%－100.00%	Model determination
F11.08	Magnetic saturation coefficient of asynchronous motor 4	0.00%－100.00%	Model determination
F11.09	Magnetic saturation coefficient of asynchronous motor 5	0.00%－100.00%	Model determination

6.3 Group F2 Motor control parameters

6.3.1 F20 V/F control parameters

No.	Parameter description	Setting range	Factory value
F20.00	V/F curve setting	0-8	0

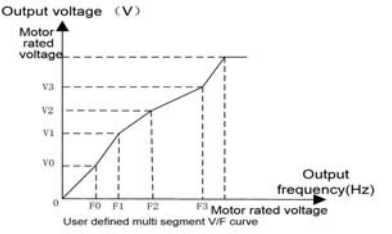
0: line V/F

It is suitable for common constant torque load. When the output frequency of the VFD is 0, the output voltage is 0: when the output frequency is the rated frequency of the motor, the output voltage is the rated voltage of the motor.

1: multi segment V/F (defined by F20.01~F20.08)

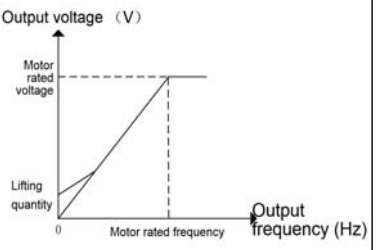
It is suitable for centrifugal loads, such as fan, water pump and so on. When the output frequency of the VFD is 0, the output voltage is 0; when the output frequency is the rated frequency of the motor, the output voltage is the rated voltage of the motor. In addition, it can also set 4 inflection points through F20.01~F20.08 to form a multi segment V/F curve. As shown in the right picture.

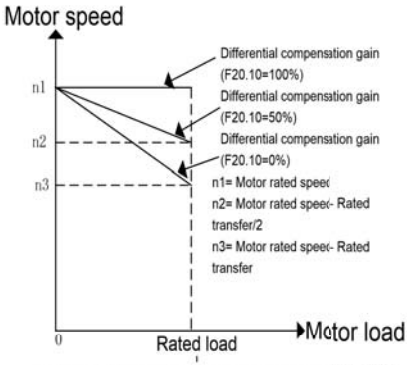
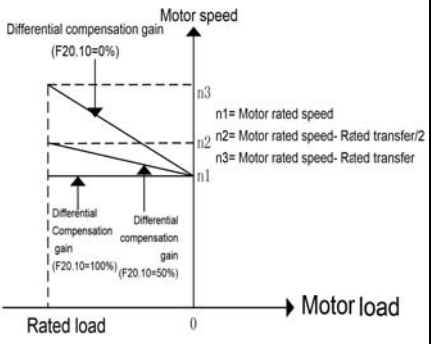
The V0, V1, V2, V3 and F0, F1, F2, F3 in the diagram are the frequency values and voltage values set by the function code F20.01~F20.08.



User defined multi segment V/F curve

2~6 is suitable for reducing torque loads such as fans and pumps, as shown in the figure

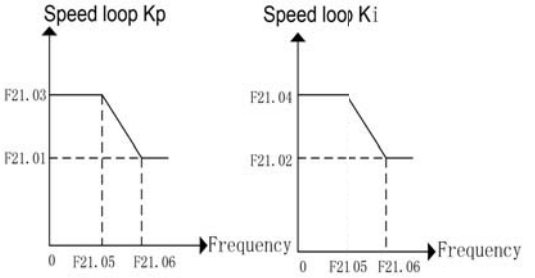
No.	Parameter description	Setting range	Factory value
	2: 1.2 pow. 3: 1.4 pow. 4: 1.6 pow. 5: 1.8 pow. 6: 2.0 pow. 7: separation of V/F The output and output voltage can be set independently. The mode of output voltage is given by the mode set by F20.16. The details are F20.16 function description. Application for power supply or torque motor control and other applications		
F20.01	**V/F frequency value F0**	**0.00Hz－F20.03**	**0.00Hz**
F20.02	**V/F voltage value V0**	**0.0%－F20.04**	**0.0%**
F20.03	**V/F frequency value F1**	**F20.01－F20.05**	**0.00Hz**
F20.04	**V/F voltage value V1**	**F20.02－F20.06**	**0.0%**
F20.05	**V/F frequency value F2**	**F20.03－F20.07**	**0.00Hz**
F20.06	**V/F voltage value V2**	**F20.04－F20.08**	**0.0%**
F20.07	**V/F frequency value F3**	**F20.05－F10.05**	**50.00Hz**
F20.08	**V/F voltage value V3**	**F20.06－100.0%**	**100.0%**
	It is used to define any V/F curve; see the above figure. F20.05F10.05 (motor rated frequency)		
F20.09	**Torque lifting**	**0.0%－30.0%**	**0.0%**
	0.0% is for automatic torque lifting V/F control; this function can compensate output voltage at low frequency, so it can improve torque output ability at low frequency. Automatic torque lifting is set to 0 by detecting load current, output voltage of the VFD is automatically compensated. Automatic torque lifting is only effective in linear V/F curve, that is, automatic torque lifting function is invalid when F20.00 is not 0. It is set to manual torque lift at a non 0 time, and 100% of torque lift corresponds to rated voltage of the motor. The manual torque lifting is used to increase output current on basis of V/F curve, and it is effective for F20.00 to be set to 0~6. When parameters are set, it can be gradually increased from zero until starting requirements are met. The lifting capacity can not be set too large; otherwise it will easily lead to excessive drive current and severe motor heating. The diagram of the torque lifting schematic, such as the following diagram. 		
F20.10	**Differential compensation gain**	**0.00－300.0%**	**100.0%**
	V/F control is used. When the motor VFDs the electric load, the motor speed will decrease with the increase of load. When the motor VFDs the generator load, the motor speed will increase with the increase of load. By setting the appropriate transfer compensation gain value, the motor speed		

No.	Parameter description	Setting range	Factory value
	change caused by the change of the load can be compensated, thus the torque of the motor can be kept constant. In order to use the function of transfer compensation normally, the rated speed of the F10.06 motor must be set up correctly according to the parameters of the motor nameplate. F10.06 is the rotational speed when the motor is driven by the rated electric load, and the speed difference between the motor and the motor is rated as the nominal rotation difference. Differential compensation is used to detect the load of the motor in real time. The output frequency of the VFD is automatically adjusted according to the rated transfer and the size of the motor load, thus reducing the influence of the load change on the motor speed. Gain adjustment: please adjust it near 100%. When the motor VFDs the electric load, such as the motor speed is low, the gain is properly increased, such as the motor speed is high, and the gain is properly reduced. When the motor is dragging the power load, such as the motor speed is low, the gain is reduced properly, for example, the motor speed is high, and the gain is properly increased. The transfer compensation gain schematic diagram, as shown in Figure 1, and Figure 2.  Figure1 differential compensation for electric power  Figure2 differential compensation for braking		
F20.11	**Droop control**	**0.00Hz—10.00Hz**	**0.00Hz**
	Droop control means that as load increases, output frequency of the VFD decreases, so as to ensure that load of each motor is evenly distributed when multiple motors are dragging the same load. This function is genera lly applicable to a number of motor VFDs in the same load situation.		
F20.12	**Current limiting coefficient in weak magnetic region**	**0.001—1.000**	**0.500**
	When VFD is running over rated frequency, it can effectively improve acceleration and deceleration characteristics and output torque of the VFD through reasonable given parameter,.		
F20.13	**Energy saving efficiency**	**0.0%—40.0%**	**0.0%**
	During the operation of no load or light load, the motor can reduce the output voltage and reduce the copper loss and iron loss by detecting the load current, so as to achieve the purpose of energy saving. The greater the energy saving coefficient is, the better the energy saving effect, but the response to the load increase is slow. It is suitable for the working conditions of the load of the fan and water pump or the long term light load operation. For rapid changes in the load, this function will lead to a slow response, and please use it carefully.		

No.	Parameter description	Setting range	Factory value
	The energy saving coefficient is set to 0 to indicate that this function is invalid.		
F20.14	**Inhibition concussion coefficient 1**	**0—256**	**40**
F20.15	**Inhibition concussion coefficient 2**	**0—256**	**40**
F20.16	**Selection of voltage given in V/F separation mode**	**0—5**	**0**
	V/F separation is valid when F20.00 is set to 7. 0: F20.17 digital given When V/F separation mode is used, output voltage of the VFD is completely set by F20.17. 100% corresponds to rated voltage of the motor. 1: analog input AI1 2: analog input AI2 3: analog input AI3 When V/F separation mode is used, output voltage of the VFD is completely set by AI analog input. The maximum set value is rated voltage of the motor. 4: process PID output The output voltage is produced according to the process output PID. The output of the output voltage process PID is determined by the V/F separation mode 5: process PID output +AI1 In the V/F separation mode, the output voltage of the VFD is determined by the AI1 analog input + process PID output. The maximum set value for AI1 is Motor rated voltage		
F20.17	**Voltage digital given in V/F separation mode**	**0.0%—100.0%**	**0.0%**
	When F20.16 selects 0, the output voltage is given by F20.17		
F20.18	**Voltage variation time of V/F separation mode**	**0.00s—600.00s**	**0.01s**
	Set output voltage change rate in V/F separation mode. This time is from 0V to motor rated voltage rise time or motor rated voltage to 0V drop time.		

6.3.2 Group F21 Vector control parameters

No.	Parameter description	Setting range	Factory value
F21.00	**Speed / torque control selection**	**0—1**	**0**
	0: speed control **1: torque control**		
F21.01	**ASR high speed proportional gain Kp**	**0.00—30.00**	**2.00**
F21.02	**ASR high speed integral time Ti**	**0.000—10.000s**	**0.200s**
F21.03	**ASR low speed proportional gain Kp**	**0.00s—30.00**	**2.00**
F21.04	**ASR low speed integral time Ti**	**0.000—10.000s**	**0.200s**
F21.05	**ASR switching frequency 1**	**0.00Hz—F21.06**	**5.00Hz**
F21.06	**ASR switching frequency 2**	**F21.05—Upper frequency**	**10.00Hz**
	In the speed control mode of vector control, the speed loop controller (ASR) is used to control the speed of the motor as the set value. Please set the speed loop parameters at F21.01~F21.06. The proportional gain Kp of the speed loop regulator and the integral time Ti can be set by F21.01~F21.04, thus the speed response characteristic of the vector control can be changed. The increase of proportional gain Kp can accelerate the dynamic response of the system. But the		

No.	Parameter description	Setting range	Factory value
	Kp is too large, and the system is easy to produce oscillations. The dynamic response of the system can be accelerated by reducing the integral time Ti. But the Ti is too small, the system overshoot is large and easy to produce oscillations. The adjustment principle of proportional gain Kp and integral time Ti is usually adjusted first by proportional gain Kp to ensure that the system does not oscillate and to increase Kp as much as possible. Then adjusting the integration time Ti makes the system both fast response and overshoot. F21.01~F21.02 is the proportional gain and integration time of the drive when it runs at high speed. F21.03~F21.04 is the proportional gain and integration time of the drive at low speed. The distinction between high speed and low speed is set by F21.05~F21.06, and the schematic diagram is shown in the following diagram.  The speed loop parameters are generally adjusted in the following order, and the appropriate switching frequency is selected. The ratio gain F21.01 and the integration time F21.02 are adjusted to ensure that the system does not oscillate and satisfies the dynamic response characteristic requirements. Proportional gain F21.03 and integration time at low speed F21.04, which ensures no oscillation at low speed and meets the requirement of dynamic response characteristics. Note: the PI parameters of the speed loop are not well set, which may cause the overflow or overvoltage of the drive. The general principle is adjusted in the vicinity of the parameter value of the factory, which can not be changed too much.		
F21.07	**ASR input filter time (speed)**	**0.0ms－1000.0ms**	**0.3ms**
F21.08	**ASR input filter time (current)**	**0.0ms－1000.0ms**	**0.3ms**
F21.09	**Kp ACR excitation proportional gain Kp**	**0－4000**	**1000**
F21.10	**Ki ACR excitation integral gain Ki**	**0－4000**	**1000**
F21.11	**ACR torque proportional gain Kp**	**0－4000**	**1000**
F21.12	**ACR torque integral gain Ki**	**0－4000**	**1000**
	Vector control current loop PI adjustment parameters, this parameter is automatically obtained after the asynchronous motor rotation self learning, and generally does not need to be modified. It is important to note that the integral regulator of the current loop does not use the integral time as the dimension, but directly sets the integral gain. The PI gain of the current loop is too large, which may lead to the oscillation of the entire control loop. Therefore, when the current oscillation or torque ripple is large, the PI proportional gain or integral gain can be reduced manually.		
F21.13	**Preexcitation time**	**0.000s－5.000S**	**0.200s**
	It is suitable for asynchronous motor. In order to achieve fast starting characteristics, pre excitation		

No.	Parameter description	Setting range	Factory value
	is carried out before motor is run, and pre excitation time is set by function code. After setting up stable magnetic flux, it starts to speed up. The set value is 0 indicating that pre excitation is not carried out, and operation is accelerated after receiving operation instruction. Preexcitation time is not included in acceleration and deceleration time. According to factory value, no need to modify.		
F21.14	**Electric transfer compensation gain**	**10.0%—200.0%**	**100.0%**
	In vector control, the change of this parameter can adjust the precision of the speed of motor with electric load running. When the load is heavier, if the motor speed is low, this parameter is added, such as high speed.		
F21.15	**Brake slip compensation gain**	**10.0%—200.0%**	**100.0%**
	In vector control, the change of this parameter can adjust the precision of the speed of the motor with the power generation load. When the load is increased, the parameter is increased if the motor speed is high, if the speed is low, the parameter is reduced.		
F21.16	**Torque limiting coefficient in weak magnetic field**	**0.0%—100.0%**	**50.0%**
	Under the vector control speed control mode, when the VFD runs in the area above the rated frequency of the motor, the appropriate output coefficient can effectively improve the output torque and acceleration and deceleration characteristics of the motor.		
F21.17	**Torque control torque setting channel**	**0~7**	**0**
	The torque control mode of vector control is used to select the given way of torque through this function code 0: number setting F21.18 The torque is given by F21.18. 100% corresponds to the rated torque of the motor. 1: analog input AI1 2: analog input AI2 3: analog input AI3 The torque is set by the analog input, and the torque setting range is 0~200% rated torque. 4: pulse given (DI) The torque is set by the pulse given DI. The torque setting range is 0~200% rated torque. 5: Communication given The upper computer sets the torque setting value of the VFD through the standard RS485 communication interface of the VFD. Specific programming methods and operating parties Please refer to the F03 function and the appendix instructions for the law, the communication protocol, etc. 6: Min (AI1, AI2) 7: Max (AI1, AI2)		
F21.18	**Torque control torque digital setting value**	**—200.0%—200.0%**	**0.0%**
	When F21.18 selects 0, the torque is set by this function code, and 100% is the rated torque of the motor.		
F21.19	**Electric torque limited channel**	**0~5**	**0**
	Under the vector control speed control mode, when the motor VFDs the electric load, the electric torque of the motor output is limited, and the electric torque limit mode is selected by this function code. 0: number setting F21.20 The output electric torque is limited by the F21.20 digital set value. 100% corresponds to the rated torque of the motor.		

No.	Parameter description	Setting range	Factory value
	1: analog input AI1 2: analog input AI2 3: analog input AI3 The electric torque is limited by analog input. The range of electric torque is 0~200% rated torque. 4: pulse given (DI) The electric torque is limited by the pulse given DI. The range of electric torque is 0~200% rated torque. 5: Communication given The upper computer sets the VFD's electric torque limit through the built-in standard RS485 communication interface of the VFD. Specific programming methods, operation methods, communication protocols, and so on, please refer to the F03 group functions and appendix instructions.		
F21.20	**Finite value digital given for electric torque**	**0.0%—200.0%**	**180.0%**
	When the F21.20 is selected to be 0, the maximum electric torque of the motor is limited by this set value. 100% corresponding motor rated torque		
F21.21	**Brake torque limited channel**	**0~5**	**0**
	Under the vector control speed control mode, when the motor VFDs the generator load, the braking torque of the motor output is limited, and the braking torque limit value is selected by this function code. 0: F21.22 digital setting The output braking torque is limited by the F21.22 digital set value. 100% corresponding motor rated torque 1: analog input AI1 2: analog input AI2 3: analog input AI3 The braking torque is limited by the analog input. The limit range of braking torque is 0~200% rated torque 4: pulse given (DI) The braking torque is limited by the pulse given DI. The limit range of braking torque is 0~200% rated torque. 5: Communication given The upper computer sets the limit value of the VFD's braking torque through the standard RS485 communication interface of the VFD. Specific programming methods, operation methods, communication protocols, and so on, please refer to the F03 group functions and appendix instructions.		
F21.22	**Digital setting of brake torque limit value**	**0.0%—200.0%**	**180%**
	When F21.21 is selected to be 0, the maximum braking torque of the motor is limited by this set value. 100% corresponding motor rated torque		
F21.23	**Torque control forward speed limit channel**	**0~5**	**0**
	In torque control, if the torque is greater than the load torque, the torque of the motor will continue to rise. In order to avoid the flying car, a maximum speed can be set to limit the motor speed to not exceed this limit value. The function code is to select the limiting mode for maximum speed at the time of positive rotation. 0: F21.24 digital setting Setting the rate limit for the forward speed by F21.24		

No.	Parameter description	Setting range	Factory value
	1: analog input AI1 2: analog input AI2 3: analog input AI3 The maximum speed limit of the forward rotation is set by the analog input, and the limit range is the maximum frequency of 0~. 4: pulse given (DI) The maximum speed limit of the forward rotation is set by the pulse given DI. The limit is: the maximum frequency of 0~. 5: Communication given The upper computer set up maximum speed limit value of positive rotation through standard RS485 communication interface built in VFD, specific programming method, operation method, communication protocol and so on. Please refer to the F03 group function and appendix.		
F21.24	**Torque control forward speed limit value**	**0.00Hz—Max. frequency**	**50.00Hz**
	When F21.23 selects 0, the forward speed limit is set by this function code		
F21.25	**Torque control reverse speed limited channel**	**0~5**	**0**
	In torque control, if the torque is greater than the load torque, the torque of the motor will continue to rise. In order to avoid the flying car, a maximum speed can be set to limit the motor speed to not exceed this limit value. This function code is the way to limit the maximum speed when the reversal is selected. 0: F21.26 digital setting Setting the reversal speed limit from F21.26 1: analog input AI1 2: analog input AI2 3: analog input AI3 The maximum speed limit of the inversion is set by the analog input, and the limit is the maximum frequency of 0~. 4: pulse given (DI) The maximum speed limit of the reversal is set by a pulse given DI. 5: Communication given The upper computer set the maximum speed limit value through the standard RS485 communication interface built in the VFD, the specific programming method, operation method, and communication protocol and so on. Please refer to the F03 group function and appendix.		
F21.26	**Torque control reversal speed limit value**	**0.00Hz—Max. frequency**	**50.00Hz**
	When F21.26 selects 0, the speed limit is set by this function code		
F21.27	**Torque control torque setting and subtraction time**	**0.00s—200.00s**	**1.00s**
	The torque control mode sets the torque from 0 to the rated torque or from the rated torque to 0, that is, to define the increase or decrease of the torque.		
F21.28	**Static friction torque compensation**	**0.0%—100.0%**	**0.0%**
	The torque control method is effective. In order to overcome the static friction of the system, the rated torque is provided at the start of the system. When the motor is running, the static friction torque compensation is not effective. 100% corresponding motor rated torque		
F21.29	**Sliding friction torque compensation**	**0.0%—100.0%**	**0.0%**
	The torque control method is effective. The extra torque is provided to overcome the sliding friction of the system running. 100% corresponding motor rated torque		

No.	Parameter description	Setting range	Factory value
F21.30	**Inertia moment compensation coefficient**	**0.000—1.000**	**0.000**
	The torque control method is effective. To compensate for the extra torque required to overcome the mechanical transmission inertia during the acceleration and deceleration of the system.		
F21.31	**Vector mode optimization options**	**00~11**	**00**
	Single bit: Feed forward compensation enabling 10 bits: Automatic Flux adjustment 0: null and void 1: action		

6.3.3 F22 Encoders parameters

No.	Parameter description	Setting range	Factory value
F22.00	**Speed feedback encoder selection**	**0—1**	**0**
	0: local 1: expansion		
F22.01	**Local encoder line number**	**1—10000**	**2500**
	Also named pulses number per rotation of the encoder. When PG vector control is selected, it must be set correctly; otherwise the motor can not operate normally.		
F22.02	**Local encoder direction**	**0—1**	**0**
	0: forward A phase ahead of motor forward rotation (B phase ahead of motor reversals) 1: reverse B phase ahead of motor forward rotation (A phase ahead of motor reversals) If the A, B phase output signal of the local encoder and the rotation direction of the motor are not matched, the A and B phase output connections need to be exchanged. You can also change the set value of the F22.02. Without rewiring		
F22.03	**Local encoder speed ratio molecular value**	**1—65535**	**1000**
F22.04	**Local encoder speed ratio parent value**	**1—65535**	**1000**
	When the encoder is not installed on the motor, the motor can also have PG vector control by setting the deceleration ratio correctly. This parameter is defined as the ratio of the speed of the motor to the encoder. That is: the speed of F22.03:F22.04= motor speed: speed of the encoder For example, deceleration of motor and spindle on machine tool is 3:1, that is, the motor rotates 1 circle in 3 circles and encoder and spindle are connected by 1:1 transmission ratio, say, when setting F22.03 is 3000, F22.04 is 1000, and coded signal can be connected to drive with PG vector control. If the encoder is installed directly on the motor, the F22.03 and F22.04 can be equal. Please set it correctly according to the actual transmission ratio, otherwise the drive will run abnormally.		
F22.05	**Broken line detection time of local encoder**	**0.0s—8.0s**	**2.0s**
	0.0s: no detection It is effective in the way of PG vector control. The detection time of the PG broken line is set in seconds. The VFD does not detect the encoder A and B phase input signals at the time of F22.05 setting when running at a non-zero speed, and reports "CLL" fault and stops. It is set to 0 to indicate that the broken line detection is not performed.		
F22.06	**Local encoding initial angle**	**0.00°—359.99°**	**0.00°**

No.	Parameter description	Setting range	Factory value
F22.07	Extended coding type	0—5	0
	0: ABZ encoder 1: UVW encoder 2: rotary transformer 3: cosine coder 4: absolute value encoder 5: provincial line encoder		
F22.08	Extended encoder line number	1—10000	2500
	When selecting extension card to enter the encoder signal, the number of the lines of the encoder is set by the F22.08, also named pulses number per rotation. It must be set correctly, otherwise the motor can not operate normally. When a rotating transformer is used, the number of lines is set as logarithm of the 1000* rotating transformer.		
F22.09	Extended encoder direction	00~11	00
	Single bit: ABZ direction 0: forward, when the motor is forward, the A phase is ahead of the motor (when the motor reverses the B phase ahead) 1: reverse, B phase forward when motor reverses (A phase ahead of motor reversals) If the A, B phase output signal of the extended encoder and the rotation direction of the motor are not matched, the A and B phase output connections need to be exchanged. Can also be changed The set value of the F22.09, without the need for rewiring. This parameter is effective for both asynchronous motor and synchronous motor. After the F10.01 is set as PG vector control, the asynchronous motor rotation identification or synchronous motor identification is carried out, and AB direction can be automatically obtained. 10 bits: UVW direction 0: positive 1: reverse It is used for the use of the UVW encoder input mode for the use of the motor. This direction can be automatically obtained after the motor identification.		
F22.10	Molecular value of the speed ratio of the extended encoder	1—65535	1000
F22.11	Speed ratio parent value of extended encoder	1—65535	1000
	When the encoder is not installed on the motor, the motor can also have PG vector control by setting the deceleration ratio correctly. This parameter is defined as the ratio of the speed of the motor to the encoder. That is: the speed of the F22.10:F22.11= motor: the speed of the encoder For example, the deceleration ratio of motor and principal axis is 3:1, say motor rotates 1 circle in 3 circles and the encoder and spindle are connected by 1:1 transmission ratio, say, when setting F22.10 is 3000, F22.11 is 1000, coded signal can be connected to drive with PG vector control. If the encoder is installed directly on the motor, the F22.10 and F22.11 can be equal. Please set it correctly according to the actual transmission ratio, otherwise the drive will run abnormally.		
F22.12	Extended encoder broken line detection time	0.0s—8.0s	2.0s
	0.0s: no detection		
F22.13	Expansion encoder initial angle	0.00°—359.99°	0.00°
F22.14	Extended encoder pole logarithm	1—32	1

No.	Parameter description	Setting range	Factory value
F22.15	Over speed detection value	0.0%—120.0%	120.0%
	0.0%—120.0%: Relative maximum frequency		
F22.16	Over speed detection time	0.00s—20.00s	0.00s
	0.00s: no detection		
F22.17	Over deviation detection value	0.0%—50.0%	10.0%
	0.0%—50.0%: Relative maximum		
F22.18	Over deviation detection time	0.00s—20.00s	0.00s
	0.00s: no detection		

6.4 F3 Terminal parameters

6.4.1 F30 switching value

No.	Parameter description	Setting range	Factory value
F30.00	Terminal detection	000—7FF	000
	Single bit: BIT0~BIT3:X1~X4 10 bits: BIT0~BIT3:X5~X8 100 bits: BIT0 ~ BIT2:AI1AI3 This function is only valid for the operation command terminal, that is, the switching terminal of the 1~4 function is set up, and it is only effective for the first operation of the power supply. 0: level effective When the terminal is given a running command, the state of the running terminal is detected at ON after power up, and the frequency conversion starts to run. If the running terminal state of the drive is on ON, then the VFD will start running after power up. Please ensure the running terminal state before power up to ensure the safety of the equipment and life. 1: the edge is effective When the terminal is given a run command, the VFD starts to run when the terminal is detected from the jump from OFF to ON and is maintained as ON. If the drive terminal is running in the ON state before power on, the VFD doesn't run after power on, and the operation command terminal is set to OFF. After setting ON, the VFD can run.		
F30.01	X1 Terminal function selection	00—63	01
F30.02	X2 Terminal function selection	00—63	02
F30.03	X3 Terminal function selection	00—63	00
F30.04	X4Terminal function selection	00—63	00
F30.05	X5 Terminal function selection	00—63	00
F30.06	X6 Terminal function selection	00—63	00
F30.09	AI1 Terminal function selection	00—63	00
F30.10	AI2 Terminal function selection	00—63	00
F30.11	AI3 Terminal function selection	00—63	00
	00: no function 01: forward running (FWD) The VFD is running through the terminal control. Please refer to the instructions of F30.00 for the first action selection. 02: reverse run (REV) Reverse operation by terminal control drive. Please refer to the instructions of F30.00 for the		

No.	Parameter description	Setting range	Factory value
	choice of action for the first time on power 03: positive rotation point (FJOG) Through the terminal, the positive turning point moves, the point movement frequency is F00.16, the point acceleration time is F02.09, the deceleration time is F02.10. When the first power on is selected, please refer to F30.00's explanation. 04: reverse point motion (RJOG) Through the terminal, the positive turning point moves, the point movement frequency is F00.16, the point acceleration time is F02.09, the deceleration time is F02.10. When the first power on is selected, please refer to F30.00's explanation. 05: running pause In the course of the drive, the VFD immediately stops the output after receiving the pause terminal signal. After the suspension signal is cancelled and the operating conditions are met, the VFD is at full speed to track the start. 06: Operation prohibition When the VFD is running, the "run ban" terminal is valid, the drive blocks the output and runs at zero frequency. Once the "run forbidden" terminal is invalid, the drive starts to run. 07: external shutdown When valid, the drive is shut down in the manner set by the F01.10 (stop mode selection). It is valid for all run command channels. 08: a free stop The VFD immediately terminates the output after receiving the terminal commands, and the load is shut down freely according to the mechanical inertia. 09: emergency shutdown When the VFD receives the terminal command, the VFD decelerates and stops, and the deceleration time is set at 2.08 (emergency stop time). 10: fault input The VFD can detect the fault signal of the external device to carry out the protection action through the terminal. After receiving the fault signal from the external device, the VFD shows the fault of the external device. 11: fault reset (RST) When the VFD fails to alarm, the failure can be reset through the terminal. Its function is consistent with the STOP key reset function of the operation panel. 12: three line operation The forward running (FWD) and reverse operation (REV) have two line mode operation mode and third line control operation mode. When the third line system is running, the "three line running" terminal is involved in the control. Detailed description of two line and third line system reference F30.12 (FWD/REV) terminal control mode selection. 13: Prohibition of acceleration and deceleration Keep the motor not affected by any external signal (except for shutdown order) and maintain the current speed operation. Ineffective in the process of slowing down.		

No.	Parameter description	Setting range	Factory value

14: add deceleration time to choose 1

15: add deceleration time to choose 2

The terminal time logic combination by 1,2 can achieve acceleration and deceleration, deceleration time 1-4 choice. See the following table.

Acceleration and deceleration time terminal 2 (No. 15 function)	Acceleration and deceleration time terminal 1 (No. 14 function)	acceleration & deceleration selection
OFF	OFF	Acceleration & deceleration time 1
OFF	ON	Acceleration & deceleration time 2
ON	OFF	Acceleration & deceleration time 3
ON	ON	Acceleration & deceleration time 4

16: running DC brake

17: stop DC brake

If the VFD receives the shutdown command, if the shutdown mode is deceleration stop + DC braking (F01.10 = 2), and the running frequency is lower than the stopping DC braking initial frequency (F01.11), the VFD starts DC braking. The braking current is set by F01.12. The braking time is a long time between the terminal function holding time and the shutdown DC braking time (F01.13).

18: stop DC brake + shutdown command

When the terminal is stopped, DC brake + stop order is effective, the VFD starts to slow down and stop. When the output frequency is reduced to the initial frequency of braking, DC braking is started. Brake brake initial frequency and current setting in F01.11~F01. 12, F01.13 braking time set time and duration of the larger value of the terminal.

19: multistage frequency terminal 1

20: multistage frequency terminal 2

21: multistage frequency terminal 3

22: multistage frequency terminal 4

Through the logical combination of terminals, the running curve of 16 segments can be defined at most.

X4 (#22 function)	X3 (#21 function)	X2 (#20 function)	X1 (#19 function)	Frequency setting
OFF	OFF	OFF	OFF	Multi segment frequency digital given 0
OFF	OFF	OFF	ON	Multi segment frequency digital given 1
OFF	OFF	ON	OFF	Multi segment frequency digital given 2
OFF	OFF	ON	ON	Multi segment frequency digital given 3
OFF	ON	OFF	OFF	Multi segment frequency digital given 4
OFF	ON	OFF	ON	Multi segment frequency digital given 5
OFF	ON	ON	OFF	Multi segment frequency digital given 6

No.	Parameter description	Setting range	Factory value

OFF	ON	ON	ON	Multi segment frequency digital given 7
ON	OFF	OFF	OFF	Multi segment frequency digital given 8
ON	OFF	OFF	ON	Multi segment frequency digital given 9
ON	OFF	ON	OFF	Multi segment frequency digital given 10
ON	OFF	ON	ON	Multi segment frequency digital given 11
ON	ON	OFF	OFF	Multi segment frequency digital given 12
ON	ON	OFF	ON	Multi segment frequency digital given 13
ON	ON	ON	OFF	Multi segment frequency digital given 14
ON	ON	ON	ON	Multi segment frequency digital given 15

23: command switch to panel control

When valid, the run command channel is forced to switch to the operation panel mode.

24: command switch to terminal control

When valid, the run command channel is forced to switch to the terminal to run the command channel.

25: command switch to communication control

When valid, the run command channel is forced to switch to a communication mode command channel. The run command channel switch can be switched during the drive process, but all of the switches take effect only when the machine is down.

26: frequency given switching (F00.06[bit)

According to the frequency source superposition selection function code (F00.06) setting, the terminal is used to implement the switching of the two frequency sources when the set is switched to two frequency sources.

27: master frequency source switch to frequency digital setting F00.00

28: the switching of the auxiliary frequency source to the frequency digital setting F00.02

29: terminal adjustment and UP

30: terminal adjustment and DN

Through terminal, the increasing and decreasing of a given frequency can be realized. When the frequency setting mode is "digital given +UP/DN adjustment", the setting frequency can be adjusted up and down, and the speed will be adjusted.

31:UP/DN set zero (terminal, keyboard)

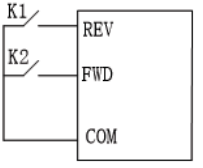
After the terminal has the command valid, remove panel ▲/▼adjustment or the terminal UP/DOWN regulation frequency

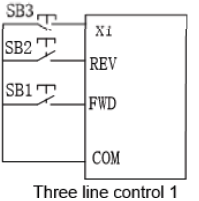
32: pulse input (X4/DI support high speed)

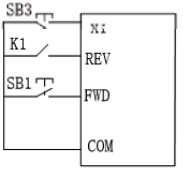
Only for the switching amount input X4/DI, the terminal receives the pulse signal as a given frequency, the relationship between the pulse frequency of the input signal and the set frequency. See also the relation between the pulse frequency of the input signal and the set frequency,

33: count input

<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td></td><td colspan="3">
The input terminal of the count pulse, the highest frequency of the pulse is 200Hz, and the current count can be remembered when the power is off. With the function code F53.08 (setting count value) and function code F53.09 (specified count value), we can control the output of switch value from setting value to value and specifying count value to terminal.
34: count zero
In conjunction with the "count input" terminal, the value of the pulse meter is cleared.
35: length count
Only the switch quantity input terminal X4/DI is valid for the fixed length control, and the length is calculated by the pulse input. Please refer to the F53.10~F53.12 parameter description of the function code when the length of the calculation and the setting of the length of the action choice. When the length arrives, the switch quantity output "length to" terminal can output the effective signal. The current length value is remembered when the power is dropped.
36: length zero
With the use of the "length count" terminal, the length of the VFD's calculation is zero.
37: swing frequency start-up
This terminal is set only in the F53.00 set 1: using the swing frequency function, and the F53.01 swing start mode is effective when the terminal is manually input. When the terminal is invalid, the drive runs at the current set frequency, and when the terminal is valid, the drive is immediately put into the swing frequency operation. Please refer to group F53 function instructions for the mode of swing frequency operation.
38: reset frequency reset
When selecting the swing frequency function (F53.00 set to 1), no matter automatic or manual input mode (set by F53.01), the terminal will erase the swing state information of the VFD's internal memory when it is effective.
39: simple PLC memory clearance
When effective, the PLC running stage, running time, running frequency and other information of the PLC downtime memory are cleared. See the F52 group.
40: simple PLC run pause
It is used to suspend control of the PLC process in the running. When valid, keep running in the current segment, PLC runs not time; after invalid, keep the time.
41: the running failure of simple PLC
Simple PLC run-time, in the downtime state, if the terminal is effective, then the PLC operation phase in the shutdown memory is running. When the running time is invalid, the VFD starts running PLC again.
42: the direction of process PID
When effective, the direction of the PID regulator is reversed.
Through the combination of this terminal and the function code F50.04 (PID regulator action direction), the positive and negative characteristics of the PID adjustment can be selected.
<table>
<tr><th>F50.04</th><th>PID</th><th>Action characteristics</th></tr>
<tr><td>0</td><td>OFF</td><td>Positive effect</td></tr>
<tr><td>0</td><td>ON</td><td>Negative effect</td></tr>
<tr><td>1</td><td>OFF</td><td>Positive effect</td></tr>
<tr><td>1</td><td>ON</td><td>Negative effect</td></tr>
</table>
43: process PID parameter switching
When F50.14=2 and terminal function are effective, the PID parameter is switched to second sets of parameters (F50.11~F50.13).
44: process PID run pause
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td></td><td colspan="3">When valid, the process PID function temporarily fails, and the drive maintains the current frequency output to continue.
45: process PID integral pause
When the process is valid, the process PID stops integral accumulation, and the integrator keeps the current integral result unchanged. After the terminal is invalid, PID returns the cumulative calculation of the integrator.
46: speed / torque switching
47: the prohibition of torque control</td></tr>
<tr><td>F30.12</td><td>FWD/REV terminal control mode selection</td><td>0—3</td><td>0</td></tr>
<tr><td></td><td colspan="3">The multifunction input terminal FWD is defined as No. 2, which is represented as "positive turn".
The multifunction input terminal REV is defined as the number 3 function, which is represented as "reverse".
Define the four different ways that the external terminal controls the drive to run.
0: two line operation mode 1.
1: two line operation mode 2.
In terminal control mode, although the terminal level is effective, when the shutdown command is generated by other sources, and the VFD stops, even if the control terminal is positive / reverse, it is still in an effective state, and there will be no operation command.
If the drive is to run again, the valid state of the turn / reversal must be triggered again.
<table>
<tr><td>K2</td><td>K1</td><td>Mode 1</td><td>Mode 2</td></tr>
<tr><td>OFF</td><td>OFF</td><td>Stop</td><td>Stop</td></tr>
<tr><td>OFF</td><td>ON</td><td>Forward</td><td>Forwar d</td></tr>
<tr><td>ON</td><td>OFF</td><td>Reversal</td><td>Stop</td></tr>
<tr><td>ON</td><td>ON</td><td>Stop</td><td>Revers al</td></tr>
</table>


Two line control 1/2


Three line control 1
2: three line operation mode 1.
Positive rotation of SB1 rising edge
When the SB2 rising edge is valid, the reverse runs.
When the SB3 is disconnected, the drive is down.


Three line control 2
3: three line operation mode 2.
SB1 is running when the rising edge is valid.
When the K1 is closed, it reverses the operation.
When the SB3 is disconnected, the drive is down.
The multi-function input terminal X1~X6 is defined as
No. 12 function and is represented as "three line operation control"</td></tr>
<tr><td>F30.13</td><td>Input terminal valid state setting</td><td>000—7FF</td><td>000</td></tr>
</table>

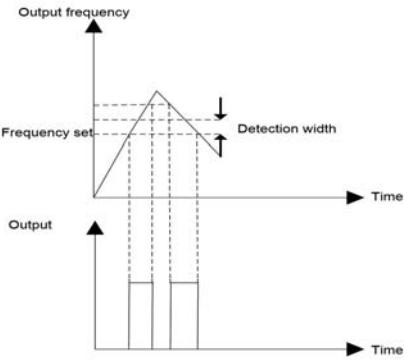
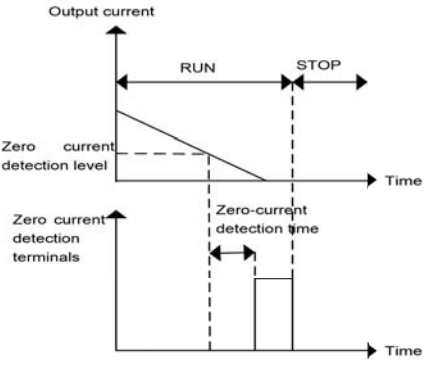
<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td></td><td>0: positive logic
1: anti logic
Single bit: BIT0 ~ BIT3: X1~X4
10 bits: BIT0 ~ BIT3: X5~X8
100 bits: BIT0 ~ BIT2: AI1~AI3
Positive logic: the multifunction input terminal is effectively connected to the corresponding public end, and the disconnection is invalid.
Anti logic: the multifunction input terminal and the corresponding common end connection are invalid, and the disconnection is valid.
<table>
<tr><th colspan="3">100 bits</th><th colspan="2">10 bits</th><th colspan="4">Single bits</th></tr>
<tr><td>Bit2</td><td>Bit1</td><td>Bit0</td><td>Bit1</td><td>Bit0</td><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr>
<tr><td>AI3</td><td>AI2</td><td>AI1</td><td>X6</td><td>X5</td><td>X4</td><td>X3</td><td>X2</td><td>X1</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>F30.14</td><td>Input terminal filter time</td><td>0.000s－2.000s</td><td>0.010s</td></tr>
<tr><td>F30.15</td><td>X1 terminal conduction delay</td><td>0.0s－3600.0s</td><td>0.0s</td></tr>
<tr><td>F30.16</td><td>X1 terminal disconnection delay</td><td>0.0s－3600.0s</td><td>0.0s</td></tr>
<tr><td>F30.17</td><td>X2 terminal conduction delay</td><td>0.0s－3600.0s</td><td>0.0s</td></tr>
<tr><td>F30.18</td><td>X2 terminal disconnection delay</td><td>0.0s－3600.0s</td><td>0.0s</td></tr>
<tr><td></td><td>For example, the X1 terminal sets the filter time F30.14 to T1, the pass delay time F30.15 is T2, the time delay time F30.16 is T3, the X1 terminal action is as shown in the following figure.
 
</td><td></td><td></td></tr>
</table>

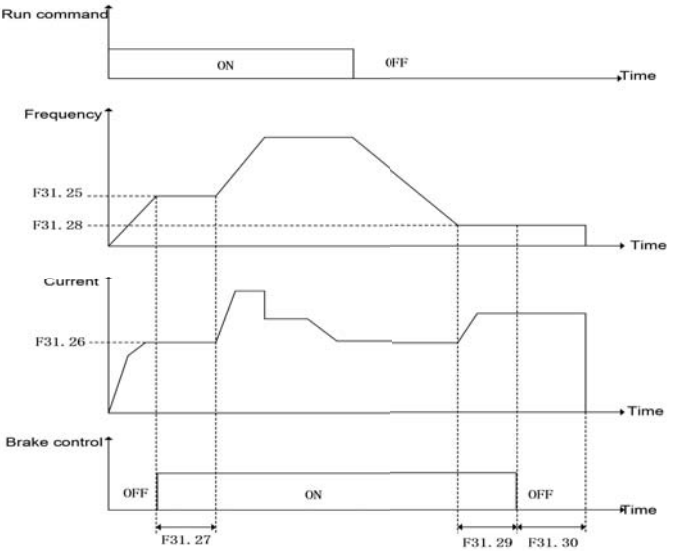
6.4.2 F31 Switch value output

<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td>F31.00</td><td>Y1 terminal function selection</td><td>00－63</td><td>00</td></tr>
<tr><td>F31.01</td><td>Y2 terminal function selection</td><td>00－63</td><td>00</td></tr>
<tr><td>F31.02</td><td>RL1 Relay Function selection</td><td>00－63</td><td>21</td></tr>
<tr><td></td><td colspan="3">00: no function
01: the actuators are under pressure
When bus voltage of the VFD is lower than under voltage point, the indication signal is output.
02: the drive is ready to complete
The drive is completed and no fault occurs, and the indication signal can be run normally.
03: drive running
The VFD is in a running state and output signal.
04: drive forward running
The VFD is turning the indication signal.
05: drive reverse run
The drive reverses the running indication signal.
06: drive DC brake
Drive DC brake indication signal.
07: VFD zero frequency operation
The output frequency of the VFD is in the zero frequency range (including the shutdown state)</td></tr>
</table>

No.	Parameter description	Setting range	Factory value
	when the indication signal is output. See parameters F31.20, F31.21. 08: VFD zero frequency operation The output frequency of the VFD is in the zero frequency range (the shutdown is invalid) to output the indication signal. See parameters F31.20, F31.21. 09: torque restriction (speed control). 10: speed limit action (torque control). 11: frequency level detection signal FDT1 See F31.13-F31.15 parameters. 12: frequency level detection signal FDT2. See F31.16-F31.18 parameters. 13: the frequency reaches FAR. When the output frequency of the VFD is in the positive and negative detection width of the set frequency, the indication signal is output. Detection width is set by F31.19 (frequency to FAR detection width) 14: upper limit of frequency Set the frequency above the upper limit frequency, output signal. 15: lower limit of frequency Set the frequency is less than or equal to lower frequency when the output signal. 16: zero current detection When the output current of the VFD is less than F31.22 (zero current detection level) and the duration is set to the F31.23 (zero current detection time), the output ON signal is output. 17:X1 terminal state The terminal state of the output X1, when X1 terminal is turned on, the output indication signal. 18:X2 terminal state The terminal state of the output X2, when X2 terminal is turned on, the output indication signal. 19: motor overload alarm When the motor is overloaded, the indication signal is output. 20: motor overheating alarm 21: drive fault output When the drive fails, the indication signal is output. 22: drive alarm output 23: drive overload alarm When the VFD is overloaded, the indication signal is output. 24: VFD overheating alarm When the drive radiator is overheated, the indication signal is output. 25: simple PLC cycle completion The simple PLC completes a running cycle and outputs the indication signal. 26: the completion of the simple PLC phase When the current phase of the simple PLC is completed, the output indication signal is output. 27: the limit of the frequency limit of the pendulum. If the swing frequency range of the pendulum frequency calculated at the center frequency exceeds the upper limit frequency or lowers than the lower limit frequency, the output indication signal is output. 28: continuous running time arrives 29: cumulative running time 30: set value to reach		

<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td></td><td colspan="3">31: the designation value arrives
See parameters F53.08, F53.09
32: set the length to reach
See parameters F53.10, F53.11
33: brake control output
See parameters F31.24, F31.30
34: location completion
35: position location approach</td></tr>
<tr><td>F31.04</td><td>Y1 pre output delay</td><td>0.0s—3600.0s</td><td>0.0s</td></tr>
<tr><td>F31.05</td><td>Y1 after output delay</td><td>0.0s—3600.0s</td><td>0.0s</td></tr>
<tr><td>F31.06</td><td>Y2 pre output delay</td><td>0.0s—3600.0s</td><td>0.0s</td></tr>
<tr><td>F31.07</td><td>Y2 after output delay</td><td>0.0s—3600.0s</td><td>0.0s</td></tr>
<tr><td>F31.08</td><td>RL1 pre output delay</td><td>0.0s—3600.0s</td><td>0.0s</td></tr>
<tr><td>F31.09</td><td>RL1 after output delay</td><td>0.0s—3600.0s</td><td>0.0s</td></tr>
<tr><td></td><td colspan="3">For example, the time delay of Y1 is T1, and the delay time after output is T2, and the Y1 action is as shown in the following figure.
 
</td></tr>
<tr><td>F31.12</td><td>Output terminal valid state setting</td><td>0—F</td><td>0</td></tr>
<tr><td></td><td colspan="3">0: positive logic
1: anti logic
BIT0:Y1/D0
BIT1:Y2
BIT2:RL1
<table>
<tr><th colspan="3">Single bit</th></tr>
<tr><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr>
<tr><td>RL1</td><td>Y2</td><td>Y1</td></tr>
</table>
Each bit (binary) that defines the function parameter represents a different physical channel. As shown in the following table:
Positive logic: the multifunction output terminal is effectively connected to the corresponding public end, and the disconnection is invalid.
Counter logic: the multifunction output terminal is invalid with the corresponding common end connection, and the disconnection is valid.</td></tr>
<tr><td>F31.13</td><td>FDT1 detection mode</td><td>0—1</td><td>0</td></tr>
<tr><td></td><td colspan="3">0: detectable at a given frequency
1: detectable by output frequency</td></tr>
<tr><td>F31.14</td><td>FDT1 level upper limit</td><td>0.00Hz—Max. frequency</td><td>2.50Hz</td></tr>
<tr><td></td><td colspan="3">FDT1 level lower limit - maximum frequency</td></tr>
<tr><td>F31.15</td><td>FDT1 level lower limit</td><td>0.00Hz—FDT1</td><td>2.00Hz</td></tr>
<tr><td></td><td colspan="3">Upper limit of the level</td></tr>
<tr><td>F31.16</td><td>FDT2 detection mode</td><td>0—1</td><td>0</td></tr>
<tr><td></td><td colspan="3">0: detectable at a given frequency
1: detectable by output frequency</td></tr>
<tr><td>F31.17</td><td>FDT2 level upper limit</td><td></td><td>2.50Hz</td></tr>
<tr><td></td><td colspan="3">FDT2 level upper limit maximum frequency</td></tr>
</table>

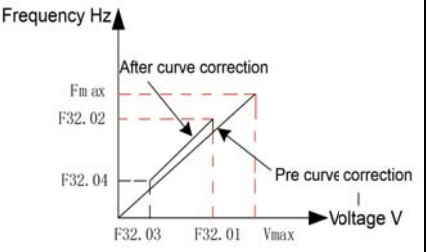
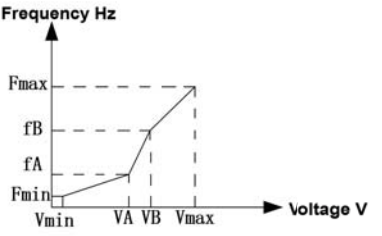
No.	Parameter description	Setting range	Factory value
F31.18	**FDT2 level lower limit**	**0.00Hz—FDT2**	**2.00Hz**
	FDT2: level upper limit		
F31.19	**Frequency (FAR) detection width**	**0.00—Max. frequency**	**2.50Hz**
	When the output frequency of the VFD is in positive and negative detection width of set frequency, the pulse signal is output.		
F31.20	**Zero frequency signal detection time**	**0.00Hz—Max. frequency**	**0.50Hz**
F31.21	**Zero frequency offset range**	**0.00Hz—Max. frequency**	**0.00Hz**
F31.22	**Zero current detection level**	**0.0%—50.0%**	**5.0%**
F31.23	**Zero current detection time**	**0.00s—50.00%**	**0.50s**
	With the switch output, the "zero current detection" terminal is used. When the output current of the VFD is less than the zero current detection level and the duration reaches the zero current detection time, the "zero current detection" terminal outputs the ON signal. As shown in the right picture.		

No.	Parameter description	Setting range	Factory value
F31.24	**Brake control selection**	**0—1**	**0**
	0: prohibition 1: action  1) Inverter receives after running the command, brake release frequency speed to F31.25 set. 2) F31.25 frequency to set the frequency, the brake control switch output terminals of the output ON signal, control the brake release. 3) To run the brake release frequency constant speed operation. During this period, the inverter controls the output current not more than the current set by the F31.26. 4) To release the brake running time frequency inverter F31.27 reaches the set value, to accelerate the run to set frequency. 5) Inverter receives the shutdown command, pull brake deceleration frequency to F31.28 set, and then the frequency constant speed operation. 6) Operating frequency reaches F31.28 the set value, the brake pull delay F31.29 set waiting time after the switch output "brake control terminal of the output OFF signal, control the brake. 7) "Brake control switch output terminals output OFF signal time reaches 31.30 set value, inverter output into the shutdown state blockade.		
F31.25	**Brake release frequency**	**0.00Hz—10.00Hz**	**2.50Hz**
	This frequency reaches the set value, the switch output "brake control terminal of the output ON signal, control the brake release. This value can be set according to the rated frequency of the motor. When V/f is controlled, it can be set a little larger		
F31.26	**Brake release current**	**0.0%—200.0%**	**120.0%**
	Before the brake release frequency inverter from start to accelerate, the brake machinery is not fully released before the current is limited to this value.		
F31.27	**Brake release time**	**0.0s—10.0s**	**0.0s**
	The brake control switch output terminals output ON signal, the setting time of inverter suspended acceleration. When this setting time is reached, it starts to run faster. Please press the brake release time required for a reasonable set of machinery.		
F31.28	**Brake pull in frequency**	**0.00Hz—10.00Hz**	**2.00Hz**
	The inverter receives the shutdown command, pull brake deceleration frequency to F31.28 set, and then wait for the output frequency constant speed operation, the brake control signal.		

No.	Parameter description	Setting range	Factory value
F31.29	**Brake pull waiting time**	**0.0s—10.0s**	**0.0s**
	The operating frequency to pull brake frequency, brake pull delay F31.29 set waiting time. Then the brake control switch output terminals output OFF signal to control the brake.		
F31.30	**Brake pull action time**	**0.0s—10.0s**	**1.0s**
	The brake control switch output terminals output OFF signal, F31.30 to maintain the set time, to ensure that the mechanical brake completely absorbed. Then the frequency inverter blocks the output and enters the shutdown state.		

6.4.3 F32 Analog quantity and pulse input

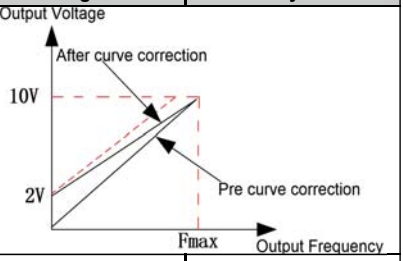
No.	Parameter description	Setting range	Factory value
F32.00	**Selection of external quantitative curve**	**0000—2333**	**0000**
	Single bit: AI1 characteristic curve selection 10 bits: AI2 characteristic curve selection 100 bits: AI3 characteristic curve selection 1000 bits: AIP characteristic curve selection 0: no correction 1: curve 1 (2) 2: curve 2 (4) 3: curve 3 (4) The function is used to realize the analog signals input to different channels, and the relationship between the analog quantity and the frequency of the external input is corresponding to the different curve correction methods.		
F32.01	**Curve 1 maximum input**	**F32.03—10.00V**	**10.00V**
F32.02	**Curve 1 maximum input corresponding value**	**-100.0%—100.0%**	**100.0%**
F32.03	**Minimum input of curve 1**	**-10.00V—F32.01**	**0.00V**
F32.04	**Minimum input corresponding value of curve 1**	**-100.0%—100.0%**	**0.0%**
F32.05	**Maximum input of curve 2**	**F32.07—10.00V**	**10.00V**
F32.06	**Maximum input corresponding value of curve 2**	**-100.0%—100.0%**	**100.0%**
F32.07	**Curve 2 fold line inflection point B input**	**F32.09—F32.05**	**0.0%**
F32.08	**Curve 2 inflection point B corresponding value**	**-100.0%—100.0%**	**0.0%**
F32.09	**Curve 2 inflexion A input**	**F32.11—F32.07**	**0.00V**
F32.10	**Curve 2 inflection point A corresponding value**	**-100.0%—100.0%**	**0.0%**
F32.11	**Minimum input of curve 2**	**-10.00V—F32.09**	**0.00V**
F32.12	**Minimum input corresponding value of curve 2**	**-100.0%—100.0%**	**0.0%**
F32.13	**Maximum input of curve 3**	**F32.15—10.00V**	**10.00V**
F32.14	**Maximum input of curve 3 corresponds to given frequency**	**-100.0%—100.0%**	**0.0%**
F32.15	**Curve 3 fold line inflection point B input**	**F32.17—F32.13**	**0.00V**
F32.16	**Curve 3 inflection point B corresponds to given frequency**	**-100.0%—100.0%**	**0.0%**
F32.17	**Curve 3 point A input**	**F32.19—F32.15**	**0.00V**

No.	Parameter description	Setting range	Factory value
F32.18	Curve 3 inflection point A corresponds to given frequency	-100.0%—100.0%	0.0%
F32.19	Minimum input of curve 3	-10.00V—F32.17	0.00V
F32.20	Minimum input of curve 3 corresponds to agiven frequency	-100.0%—100.0%	0.0%
	Curve 1 uses two points to carry out corresponding relationship between the analog quantity of the external input and the set frequency. The specific implementation process is shown in the right picture. Maximum input 100%: corresponding to 10V or 20mA, Maximum input corresponding value: the value of the maximum frequency F00.07 of the VFD. At the same time, the inverse relationship between the analog input and the set frequency can be realized. The usage of curve 2 and curve 3 is consistent; as shown in the right diagram, the relation diagram of the corresponding relation curve is shown.  V_{max} correspondence: maximum input F32.05 f_{max} correspondence: maximum input corresponding value F32.06 V_B correspondence: maximum input F32.07 f_B corresponding value F32.08 V_A correspondence: maximum input F32.09 f_A correspondence: maximum input corresponding value F32.10 V_{min} correspondence: maximum input F32.11 f_{min} correspondence: maximum input corresponding value F32.12 The following is illustrated by the example of curve 2: 		
F32.21	Analog input AI1 filtering time	0.01—10.00s	0.050s
F32.22	Analog input AI1 bias	-100.0%—100.0%	0.0%
F32.23	Analog input AI1 gain	-2.000—2.000	1.000
F32.24	Analog input AI2 filtering time	0.000s—10.000s	0.050s
F32.25	Analog input AI2 bias	-100.0%—100.0%	0.0%
F32.26	Analog input AI2 gain	-2.000—2.000	1.000
F32.27	Analog input AI3 filtering time	0.000s—10.000s	0.050s
F32.28	Analog input AI3 bias	-100.0%—100.0%	0.0%
F32.29	Analog input AI3 gain	-2.000—2.000	1.000
	In practical field applications, we can increase the filtering time of AI analog input to increase the anti-jamming ability of analog input, but excessive filtering time will reduce the response ability of AI		

No.	Parameter description	Setting range	Factory value
	analog input.		
F32.30	Analog input AIP filtering time	0.000s－10.000s	0.050s
F32.31	Analog input AIP bias	-100.0%－100.0%	0.0%
F32.32	Analog input AIP gain	-2.000－2.000	1.000
F32.33	DI maximum input frequency	DI Min. input frequency－100.00kHz	10.00kHz
F32.34	DI maximum corresponding value	-100.0－100.0%	100.0%
F32.35	DI minimum input frequency	0.00kHz－DI Max. input frequency	0.00kHz
F32.36	DI minimum corresponding value	-100.0－100.0%	0.0%
F32.37	DI input filtering time	0.000s－1.000s	0.001s
	The filtering time of the X4 terminal as the input of the pulse		

6.4.4 F33 Analog and pulse output

No	Parameter name	Set range	Factory value
F33.00	AO1 terminal output function selection	00－14	02
F33.01	AO2 terminal output function selection	00－14	01
F33.02	DO terminal output function selection (when Y1 is used as a DO, F31.00 is set to be 0 non functional)		00
	00: no output 01: a given frequency (0 maximum frequency) 02: the output frequency (0 maximum frequency) 03: the output current (0-2 times the rated current drive (relative) drive) 04: output torque (02 times rated torque) (absolute value) 05: output power (0-2 times the rated power) 06: the output voltage (02 times the motor rated voltage) 07: bus voltage (01000V) 08: AI1 input (0-10V/0-20mA) 09: AI2 input (0-10V/0-20mA) 10: AI3 input (-10V+10V) 11: pulse input (0~50kHz) 12: output current (relative motor) 13; output torque (-2 times rated torque ~2 times rated torque) (signed) 14: the torque command (02 times the motor rated torque) Others: Reserve		
F33.03	AO1 bias	-100.0%－100.0%	0.0%
F33.04	AO1 gain	-2.000－2.000	1.000
F33.05	AO1 filtering time	0.000s－10.000s	0.0s
F33.06	AO2 bias	-100.0%－100.0%	0.0%
F33.07	AO2 gain	-2.000－2.000	1.000
F33.08	AO2 filtering time	0.000s－10.000s	0.00s
	The following is an example of the relationship between the AO1 analog output and the output frequency as an example. The characteristic curve of the output under the default AO bias and gain parameters of the		

No	Parameter name	Set range	Factory value
	drive is shown in the figure "before the curve correction". Under the parameters of F33.03=20% and F33.04=0.8, the characteristic curve of the output is the "corrected curve" as shown in the figure. Increasing the AO filtering time appropriately improves the stability of AO output, but reduces the responsiveness of the AO output.		
F33.09	**DO maximum output pulse frequency**	**0.01kHz-50.00kHz**	**10.00kHz**
F33.10	**DO output center point selection**	**0—1**	**0**
	0: no center point 1: there is a central point, the center point is (F33.09) /2, and the corresponding function is positive when the frequency is greater than the center point.		
F33.11	**DO output filtering time**	**0.000s—10.000s**	**0.0s**
	The filtering time of the Y2 terminal as a pulse output		

6.4.5 F34 Analog input and output correction

No.	Parameter description	Setting range	Factory value
F34.00	**Simulation quantity correction selection**	**0000-2222**	**0000**
	Single bit: AI1 correction limiting method 10 bits: AI2 correction limiting method 100 bits: AI3 correction limiting method 1000 Bit: AIP correction limiting method 0: output unlimited amplitude 1: the amplitude of the output limit 2: lower than the lower output zero, Upper limit of upper limit output value		
F34.01	**Analog quantity mapping selection**	**0000—7777**	**0321**
	Single bit: AI1 mapping channel selection 10 bits: AI2 mapping channel selection 100 bits: AI3 mapping channel selection 1000 bits: AIP mapping channel selection 0: analog input AIP 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: analog input AI4 5: analog input AI5 6: analog input AI6 7: analog input AI7		
F34.02	**AI1 sampling value 1**	**0.00V—10.00V**	**1.00V**
F34.03	**AI1 measurement value 1**	**0.00V—10.00V**	**1.00V**
F34.04	**AI1 sampling value 2**	**0.00V—10.00V**	**9.00V**
F34.05	**AI1 measurement value 2**	**0.00V—10.00V**	**9.00V**

No.	Parameter description	Setting range	Factory value
F34.06	A AI2 sampling value 1	0.00V－10.00V	1.00V
F34.07	AI2 measurement value 1	0.00V－10.00V	1.00V
F34.08	AI2 sampling value 2	0.00V－10.00V	9.00V
F34.09	AI2 measurement value 2	0.00V－10.00V	9.00V
F34.10	AI3 sampling value 1	-10.00V－10.00V	1.00V
F34.11	AI3 measurement value 1	-10.00V－10.00V	1.00V
F34.12	AI3 sampling value 2	-10.00V－10.00V	9.00V
F34.13	AI3 measurement value 2	-10.00V－10.00V	9.00V
F34.14	AIP sampling value 1	0.00V－10.00V	1.00V
F34.15	AIP measurement value 1	0.00V－10.00V	1.00V
F34.16	AIP sampling value 2	0.00V－10.00V	9.00V
F34.17	AIP measurement value 2	0.00V－10.00V	9.00V
F34.18	AO1 output value 1	0.00V－10.00V	1.00V
F34.19	AO1 measurement value 1	0.00V－10.00V	1.00V
F34.20	AO1 output value 2	0.00V－10.00V	9.00V
F34.21	AO1 measurement value 2	0.00V－10.00V	9.00V
F34.22	AO2 output value 1	0.00V－10.00V	1.00V
F34.23	AO2 measurement value 1	0.00V－10.00V	1.00V
F34.24	AO2 output value 2	0.00V－10.00V	9.00V
F34.25	AO2 measurement value 2	0.00V－10.00V	9.00V

6.5 **F4 Display parameters**

6.5.1 F40 Display settings

No.	Parameter description	Setting range	Factory value
F40.00	Run display parameter 1 settings	00－38	07
F40.01	Run display parameter 2 settings	00－38	13
F40.02	Run display parameter 3 settings	00－38	11
F40.03	Run display parameter 4 settings	00－38	00
F40.04	Run display parameter 5 settings	00－38	00
F40.05	Run display parameter 6 settings	00－38	00
F40.06	Downtime display parameter 1 settings	00－38	06
F40.07	Downtime display parameter 2 settings	00－38	11
F40.08	Downtime display parameter 3 settings	00－38	00
F40.09	Downtime display parameter 4 settings	00－38	00
F40.10	Downtime display parameter 5 settings	00－38	00
F40.11	Downtime display parameter 6 settings	00－38	00
	The definition of operating state (F40.00F40.05) and shutdown (F40.06F40.11), operation state parameter display panel. • Can be displayed by the SHIFT key loop of the operation panel. • The display content of each display parameter can be set up to the following 38 state parameters according to its settings. • For example, when the F40.06 is set to 06, the initial power up shows the shutdown parameter as		

<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td></td><td>the setting frequency.
<table>
<tr><th>No.</th><th>Display value meaning</th><th>No.</th><th>Display value meaning</th></tr>
<tr><td>00</td><td>Ineffective display</td><td>01</td><td>Input terminal</td></tr>
<tr><td>02</td><td>Output terminal</td><td>03</td><td>Machine state</td></tr>
<tr><td>04</td><td>Running speed</td><td>05</td><td>Rotor frequency</td></tr>
<tr><td>06</td><td>Set frequency</td><td>07</td><td>Operating frequency (after acceleration&deceleration)</td></tr>
<tr><td>08</td><td>Synchro frequency</td><td>09</td><td>Local frequency</td></tr>
<tr><td>10</td><td>Expansion frequency</td><td>11</td><td>Busbar voltage</td></tr>
<tr><td>12</td><td>Output voltage</td><td>13</td><td>Output current</td></tr>
<tr><td>14</td><td>output power</td><td>15</td><td>Output torque</td></tr>
<tr><td>16</td><td>Torque given</td><td>17</td><td>AI1 voltage</td></tr>
<tr><td>18</td><td>A AI2 voltage</td><td>19</td><td>AI3 voltage</td></tr>
<tr><td>20</td><td>AIP voltage</td><td>21</td><td>A01 voltage</td></tr>
<tr><td>22</td><td>A02 voltage</td><td>23</td><td>PID given</td></tr>
<tr><td>24</td><td>PID feedback</td><td>25</td><td>PID error 误差</td></tr>
<tr><td>26</td><td>PLC stage</td><td>27</td><td>Master setup channel</td></tr>
<tr><td>28</td><td>Auxiliary setup channel</td><td>29</td><td>Master set frequency</td></tr>
<tr><td>30</td><td>Auxiliary setting frequency</td><td>31</td><td>External count</td></tr>
<tr><td>32</td><td>Set length value</td><td>33</td><td>Run length value</td></tr>
<tr><td>34</td><td>Run line speed</td><td>35</td><td>DI input frequency</td></tr>
<tr><td>36</td><td>D0 output frequency</td><td>37</td><td>Radiator temperature</td></tr>
<tr><td>38</td><td>Motor temperature</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>F40.12</td><td>Linear velocity display coefficient</td><td>0.0%－1000.0%</td><td>100.0%</td></tr>
</table>

6.5.2 F41 Operation panel

No.	Parameter description	Setting range	Factory value
F41.00	**User password setting**	**00000－65535**	**00000**
F41.01	**Function code protection item**	**0－1**	**0**
	0: all function codes allow modification 1: only F41.00 and F41.01 allow modification		
F41.02	**Function code initialization**	**0－3**	**0**
	0: no operation 1: recovery of factory parameters (without motor parameters) All parameters except the motor parameters are restored to the factory default value. 2: recovery of factory parameters (including motor parameters) All parameters are restored to the factory default value including motor parameters. 3: clear fault record information		
F41.03	**Parameter copy**	**0－3**	**0**
	0: no operation 1: parameter upload 2: parameter downloading (without motor parameters) 3: parameter downloading (including motor parameters)		

No.	Parameter description	Setting range	Factory value
F41.04	**M key function selection**	**0—4**	**3**
	Defining multi-functional M key functions 0: no function 1: switch (switch between operation panel / terminal) for a given way of running command 2: positive reversal switching 3: point movement positive rotation 4: point motion reversal		
F41.05	**Key locking function**	**0—3**	**0**
	0: not locking 1: full lock 2: locking out of multi function key 3: in addition to the RUN and STOP keys Key to the effective method and unlock see 5.2.5		
F41.06	**STOP key function**	**0—1**	**0**
	0: the STOP key is valid only in the way of keyboard operation 1: STOP keys are valid under any operating mode		
F41.07	**▲/▼and UP/DN terminal frequency control**	**000—111**	**011**
	Single bit: action selection at downtime 0: shut down 1: downtime 10 bits: action selection when power off 0: power off 1: power off maintenance 100 bits: adding and subtracting rate mode selection 0: automatic 1: Manual		
F41.08	**Manual UP/DN acceleration&deceleration rate**	**0.00Hz/s—10.00Hz/s**	**1.00Hz/s**
F42 Shortcut menu user custom display function code			
F42.00	**Frequency master given number setting**	**Thousand setting range: 0 - 9 hundreds digit setting range: 0 - 9 10 bit setting range: 0 0 - 9 Single bit setting range: 0-9**	**F00.00**
F42.01	**Frequency master given mode**		**F00.01**
F42.02	**Maximum frequency**		**F00.07**
F42.03	**Upper frequency**		**F00.08**
F42.04	**Lower frequency**		**F00.09**
F42.05	**Run command given mode**		**F01.00**
F42.06	**Running direction selection**		**F01.02**
F42.07	**Acceleration time 1**		**F02.00**
F42.08	**Deceleration time 1**		**F02.01**
F42.09	**Motor type**		**F10.00**
F42.10	**Motor control mode**		**F10.01**
F42.11	**Motor rated power**		**F10.02**
F42.12	**Motor rated voltage**		**F10.03**
F42.13	**Motor rated current**		**F10.04**

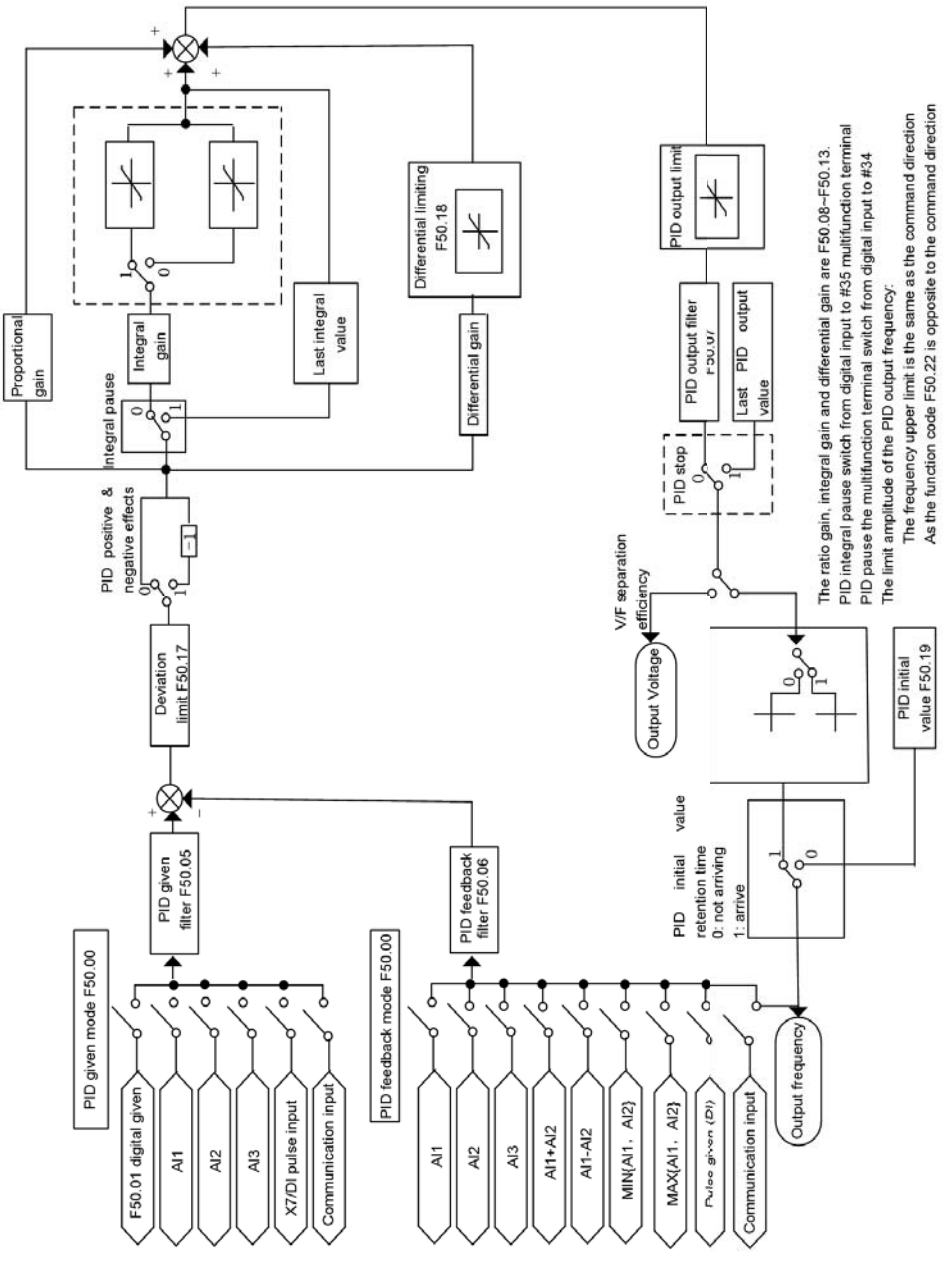
No.	Parameter description	Setting range	Factory value
F42.14	Motor rated frequency		F10.05
F42.15	Motor rated speed		F10.06
F42.16	Motor pole number		F10.07
F42.17	Motor parameter tuning		F10.08
F42.18	Function code initialization		F41.02
F42.19	M key function selection		F41.04
F42.20	Reservations	0—FFFF	FFFF
F42.21	Reservations	0—FFFF	FFFF

6.6 F5 Expansion and Application

6.6.1 F50 Process PID control

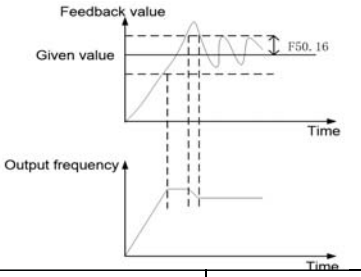
The closed loop can be formed by the given analog quantity and feedback, and the closed loop can be formed by the given pulse quantity and the feedback. In general, process PID control is used to control the physical quantity of pressure, liquid level, and temperature and so on.

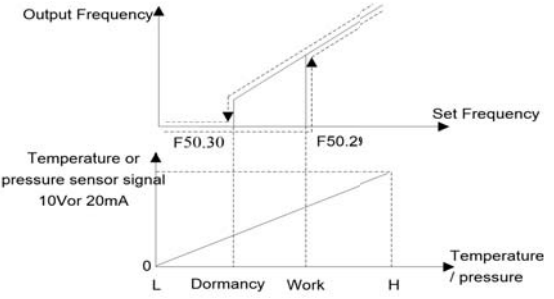
The maximum analog input value or the maximum input pulse frequency (F33.09) corresponds to the maximum output frequency (F00.07). The block diagram is shown as follows:


PID given mode F50.00
F50.01 digital given
AI1
AI2
AI3
X7/DI pulse input
Communication input
PID given filter F50.05
PID feedback mode F50.00
AI1
AI2
AI3
AI1+AI2
AI1-AI2
MIN{AI1, AI2}
MAX{AI1, AI2}
Pulse given (DI)
Communication input
PID feedback filter F50.06
Deviation limit F50.17
PID positive & negative effects
Integral pause
Proportional gain
Integral gain
Last integral value
Differential limiting F50.18
Differential gain
PID output limit
PID output filter F50.07
Last PID output value
PID stop
V/F separation efficiency
Output Voltage
PID initial value retention time
0: not arriving
1: arrive
PID initial value F50.19
Output frequency
The ratio gain, integral gain and differential gain are F50.08~F50.13.
PID integral pause switch from digital input to #35 multifunction terminal
PID pause the multifunction terminal switch from digital input to #34
The limit amplitude of the PID output frequency:
The frequency upper limit is the same as the command direction
As the function code F50.22 is opposite to the command direction

<table>
<tr><th>No.</th><th>Parameter description</th><th>Setting range</th><th>Factory value</th></tr>
<tr><td>F50.00</td><td colspan="2">PID given mode selection</td><td>0—5</td></tr>
<tr><td></td><td colspan="3">The target given channel is defined by the process PID control.
0: given by F50.01
1: analog input AI1
2: analog input AI2
3: analog input AI3
4: X4/DI pulse input (maximum pulse frequency corresponds to a maximum given voltage 10V)
5: communication input</td></tr>
<tr><td>F50.01</td><td>PID digital given</td><td>0.0%—100.0%</td><td>50.0%</td></tr>
<tr><td></td><td colspan="3">The given process PID regulator is defined. F50.00 = 0 is valid. The 10V parameter is the relative percentage of voltage, if the input current is 0~20mA, 20mA.corresponding to 10V.</td></tr>
<tr><td>F50.02</td><td>PID feedback mode selection</td><td>0—8</td><td>0</td></tr>
<tr><td></td><td colspan="3">Feedback signal channel controlled by the process PID is defined.
0: analog input AI1
1: analog input AI2
2: analog input AI3
3: AI1+AI2
4: AI1-AI2
5 :MIN {analog input AI1, AI2}
6: MAX {analog input AI1, AI2}
7: X4/DI pulse input (maximum pulse frequency corresponding to maximum feedback voltage 10V)
8: communication input</td></tr>
<tr><td>F50.03</td><td>adjustment selection</td><td>00—11</td><td>11</td></tr>
<tr><td></td><td colspan="3">Single bits: output frequency
0: must be in accordance with the setting of the running direction
1: it can be opposite to setting the running direction
10 bits: integral method
0: the integral reaches the upper and lower limits, and continues to adjust the integral
1: the integral reaches the upper and lower limits, and stops the integral adjustment</td></tr>
<tr><td>F50.04</td><td>PID positive and negative effects</td><td>0—1</td><td>0</td></tr>
<tr><td></td><td colspan="3">0: positive effect
When the feedback signal of PID is less than given, the drive frequency increases and the drive frequency of the VFD decreases when the feedback signal of the PID is greater than the ration.
1: negative effect
When the feedback signal of the PID is greater than the ration, the drive frequency increases. When the feedback signal of the PID is less than the quantity, the drive frequency decreases.
This function code can be combined with the switch quantity input "PID adjustment direction" terminal to adjust the PID positive and negative effects.
<table>
<tr><th>F50.04</th><th>PID function direction terminal</th><th>Action characteristics</th></tr>
<tr><td>0</td><td>OFF</td><td>Positive effect</td></tr>
<tr><td>0</td><td>ON</td><td>Negative effect</td></tr>
<tr><td>1</td><td>OFF</td><td>Positive effect</td></tr>
<tr><td>1</td><td>ON</td><td>Negative effect</td></tr>
</table></td></tr>
<tr><td>F50.05</td><td>PID given filter time</td><td>0.00s—10.00s</td><td>0.00s</td></tr>
</table>

No.	Parameter description	Setting range	Factory value
F50.06	PID feedback filtering time	0.00s—10.00s	0.00s
F50.07	PID output filtering time	0.00s—10.00s	0.00s
F50.08	Proportional gain Kp1	0.0—100.0	50.0
F50.09	Integral time Ki1	0.000s—50.000s	0.500s
F50.10	Differential time Kd1	0.000s—50.000s	0.000s
	0.00: the differential term does not work Process PID has two sets of proportions, integral and differential parameters, which are selected by the function code F50.14. F50.09~F50.10 is the first set of parameters. Proportional gain Kp: increase the proportional gain Kp, which can accelerate the motion response of the system. But the Kp is too large, and the system is easy to produce oscillations. The steady state error can not be eliminated only by proportional gain control. Integration time: reducing the integration time Ki, can accelerate the dynamic response of the system. But the Ki is too small; the system overshoot is large and easy to produce oscillations. The steady state error can be eliminated by the integral control, but the sharp change can not be controlled. Differential time Kd: the variation trend of the deviations can be predicted, which can respond quickly to change, change the dynamic properties, but be easily disturbed. Please use differential control carefully.		
F50.11	Proportional gain Kp2	0.0—100.0	50.0
F50.12	Integral time Ki2	0.000s—50.000s	0.500s
F50.13	Differential time Kd2	0.000s—50.000s	0.000s
	0.00: differential term does not work Process PID has two sets of proportions, integral and differential parameters, which are selected by the function code F50.14. F50.11~F50.13 is a second set of parameters.		
F50.14	PID parameter switching selection	0—2	0
	0: use only Kp1, Ki1, and Kd1 parameters Always use the Kp1, Ti1, and Td1 parameters set by F50.09~F50.10. 1: automatic switching based on input deviation When the deviation between the given and feedback of PID is less than the F50.15 set value, the parameters of Kp1, Ki1, and Kd1 set by F50.09~F50.10 are used. When the deviation between the given and feedback of PID is greater than the F50.15 set value, the parameters of Kp2, Ki2, and Kd2 set by F50.11~F50.13 are used. 2: terminal switch When the switch input is "PID parameter switching" to OFF, the Kp1, Ki1 and Kd1 parameters set by 50.09~F50.10 are used. When the switch input is "PID parameter switching" to ON, the Kp2, Ki2 and Kd2 parameters set by F50.11~F50.13 are used.		
F50.15	PID automatic switching Input deviation	0.0%—F50.11	20.0%
	When F50.09=1, the PID deviation is less than F50.10, the first set of Kp, Ki and Kd parameters are used to adjust. When the deviation is greater than the F50.11 setting value, second sets of Kp, Ki and Kd parameters are used to adjust.		
F50.16	Sampling period (T)	0.001s—50.000s	0.002s

No.	Parameter description	Setting range	Factory value
F50.17	**Deviation limit**	**0.0%－100.0%**	**0.0%**
	The maximum deviation allowed by the output value of the system relative to the maximum value of the process PID. When the amount of feedback is in this range, the PID regulator stops adjusting, as shown on the right. The proper setting of this function helps to give consideration to the accuracy and stability of the system output 		
F50.18	**Differential term limit**	**0.0%－100.0%**	**0.5%**
F50.19	**PID initial value**	**0.0%－100.0%**	**0.0%**
F50.20	**PID initial value retention time**	**0.00s－600.00s**	**0.00s**
	When the VFD starts running, the PID does not adjust, but first outputs the value of the F50.19 and keeps the time set by the F50.20 to enter the PID adjustment. When the PID initial value retention time F50.19 is 0, the initial value of PID does not work. This function allows PID to adjust quickly into the stable stage.		
F50.21	**PID operation maximum value**	**0.0%－100.0%**	**100.0%**
	0.0%－100.0%: Relative maximum		
F50.22	**PID reversal output cut-off frequency**	**0.00Hz－Upper frequency**	**0.00 Hz**
	0.00Hz PID prohibition of reversal When the PID is needed to reverse the output, it is set in accordance with the actual situation.		
F50.23	**PID downtime operation selection**	**0－1**	**0**
	0: no operation when downtime 1: downtime operation		
F50.24	**PID given loss detection value**	**0.0%－100%**	**0.0%**
	0.0%: do not detect a given loss of PID		
F50.25	**PID given loss detection time**	**0.00s－30.00s**	**0.00s**
	0: do not detect a given loss of PID The function code is used to detect whether the PID is quantified whether it is lost or not. When the detection value set less than F50.24 is set, and the duration reaches F50.25 setting value, the VFD reports a PID given loss failure.		
F50.26	**PID feedback loss detection value**	**0.0%－100%**	**0.0%**
	0.0%: Non detection of PID feedback loss		
F50.27	**PID feedback loss detection time**	**0.00s－30.00s**	**0.00s**
	0:00 no detection of PID feedback loss The function code is used to detect whether the PID feedback is lost When the feedback amount is less than the detection value of the F50.26 setting, and the duration reaches the F50.27 setting value, the VFD reports the PID feedback loss failure.		
F50.28	**PID signal loss stopping mode**	**0－1**	**0**
	0: free stop 1: emergency shutdown		
F50.29	**Zero frequency running upper bound**	**F50.30-Upper frequency**	**0.00Hz**

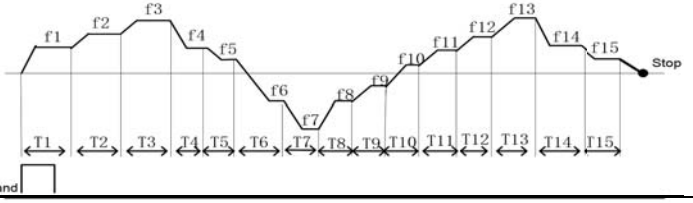
No.	Parameter description	Setting range	Factory value
	value		
F50.30	Zero frequency running lower bound value	0.00—F50.29	0.00Hz
			

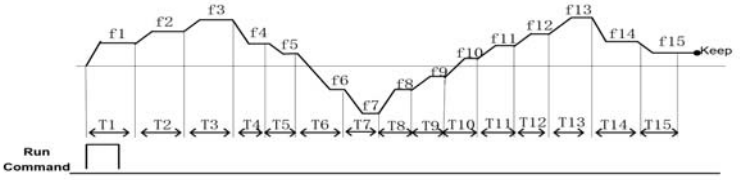
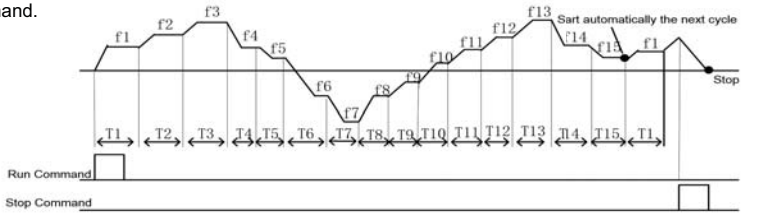
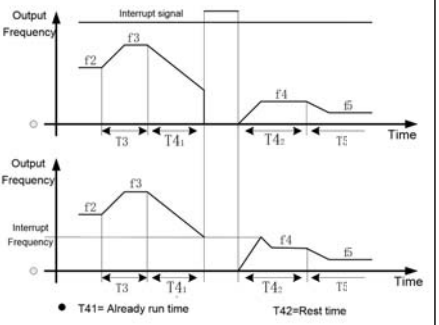
6.6.2 F51 Multistage frequency

No.	Parameter description	Setting range	Factory value
F51.00	Multi segment frequency number given 0	Lower limit frequency ~upper limit frequency	0.00Hz
F51.01	Multi segment frequency number given 1	Lower limit frequency ~upper limit frequency	0.00Hz
F51.02	Multi segment frequency number given 2	Lower limit frequency ~upper limit frequency	0.00Hz
F51.03	Multi segment frequency number given 3	Lower limit frequency ~upper limit frequency	0.00Hz
F51.04	Multi segment frequency number given 4	Lower limit frequency ~upper limit frequency	0.00Hz
F51.05	Multi segment frequency number given 5	Lower limit frequency ~upper limit frequency	0.00Hz
F51.06	Multi segment frequency number given 6	Lower limit frequency ~upper limit frequency	0.00Hz
F51.07	Multi segment frequency number given 7	Lower limit frequency ~upper limit frequency	0.00Hz
F51.08	Multi segment frequency number given 8	Lower limit frequency ~upper limit frequency	0.00Hz
F51.09	Multi segment frequency number given 9	Lower limit frequency ~upper limit frequency	0.00Hz
F51.10	Multi segment frequency number given 10	Lower limit frequency ~upper limit frequency	0.00Hz
F51.11	Multi segment frequency number given 11	Lower limit frequency ~upper limit frequency	0.00Hz
F51.12	Multi segment frequency number given 12	Lower limit frequency ~upper limit frequency	0.00Hz
F51.13	Multi segment frequency number given 13	Lower limit frequency	0.00Hz

No.	Parameter description	Setting range	Factory value
		~upper limit frequency	
F51.14	Multi segment frequency number given 14	Lower limit frequency ~upper limit frequency	0.00Hz
F51.15	Multi segment frequency number given 15	Lower limit frequency ~upper limit frequency	0.00Hz
	The frequency values of the drive at multiple segments or in a simple PLC state are defined.		
F51.16	Multi segment frequency 0 setting mode	0—7	0
	0: a number given F51.01 1: digital given (F00.00) +UP/DN regulation 2: analog input AI1 3: analog input AI2 4: analog input AI3 5: pulse given (DI) 6: process PID 7: Communication given By switching the switch quantity into the combination of "multiple frequency terminal 1~4", a maximum of 16 segments of multiple segments of frequency can be set. The multi segment frequency 2~15 is given a number of numbers, and multiple segment frequency 0~1 can choose a variety of setting methods. The F51.16 is a given way to select a multi segment frequency 0.		
F51.17	Multi segment frequency 1 setting mode	0—7	0
	0: a number given F51.01 1: digital given (F00.00) +UP/DN regulation 2: analog input AI1 3: analog input AI2 5: analog input AI3 5: pulse given (DI) 6: process PID 7: Communication given By switching the switch quantity into the combination of "multiple frequency terminal 1~4", a maximum of 16 segments of multiple segments of frequency can be set. The multi segment frequency 2~15 is given a number of numbers, and multiple segment frequency 0~1 can choose a variety of setting methods. F51.17 is the mode of selecting the multi segment frequency 1.		

6.6.3 F52 Simple PLC

No.	Parameter description	Setting range	Factory value
F52.00	Simple PLC operation mode selection	0000—1122	0000
	Single bit: PLC operation mode selection 0: a stop after a single cycle. • PLC completes an automatic shutdown after a loop and needs to give the run command again to start. Detail is shown in the picture 		

No.	Parameter description	Setting range	Factory value
	1: keep the final value after a single cycle. • PLC completes a cycle to automatically maintain the operating frequency and direction of the last section. As shown in the picture  2: continuous cycle. The drive completes a loop and automatically starts the next cycle until there is a shutdown command.  10 bits: simple PLC starting mode 0: start from stage 0 Run down (stop command, failure or power off), and start from phase 0 after starting.		
	1: continue to run from the stage of interruption - run down (outage command or failure), and drive automatically records the time that is running at the current stage. • Automatically enter this stage after restarting, and continue to run for the rest of the time defined at this stage, as shown in the diagram. 2: continue running from the running frequency of the interruption - run down (shutdown command or failure), the drive automatically records the running time of the current phase and the frequency of the shutdown time. To resume the running frequency of the shutdown and then continue the rest of the operation, as shown in the diagram. 100 bits: simple PLC power down memory 0: power reduction • the PLC running state is not remembered when the power is off. After power up, the restarting move starts from phase 0. 1: power down storage  		

No.	Parameter description	Setting range	Factory value
	• memory PLC running state when power off, including power off time stage, running frequency, and running time. After power supply, the running restart mode (F52.00 ten bit definition) is run according to the PLC interruption. 1000 bits: simple PLC time unit 0: second (s) 1: minutes (min)		
F52.01	**PLC phase 0 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 0 (F51.00) 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: Communication given 6: process PID 7: multistage frequency 10 bits: simple PLC stage running direction 0: positive 1: reverse 2: determined by the run command 100 bits: simple PLC stage plus deceleration time 0: add deceleration time 1 1: add deceleration time 2 2: add deceleration time 3 3: add deceleration time 4		
F52.02	**Stage 0 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC zeroth section, the unit of time is set by the 1000 bits of F52.00		
F52.03	**PLC phase 1 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 1 (F51.01) Other reference phase 0 settings		
F52.04	**Stage 1 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	The running time of a simple PLC first section is set, and the time unit is set by the 1000 bits of F52.00.		
F52.05	**PLC phase 2 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 2 (F51.02) Other reference phase 0 settings		
F52.06	**Stage 2 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC second section, the unit of time is set by a thousand bits of F52.00		
F52.07	**PLC phase 3 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 3 (F51.03)		

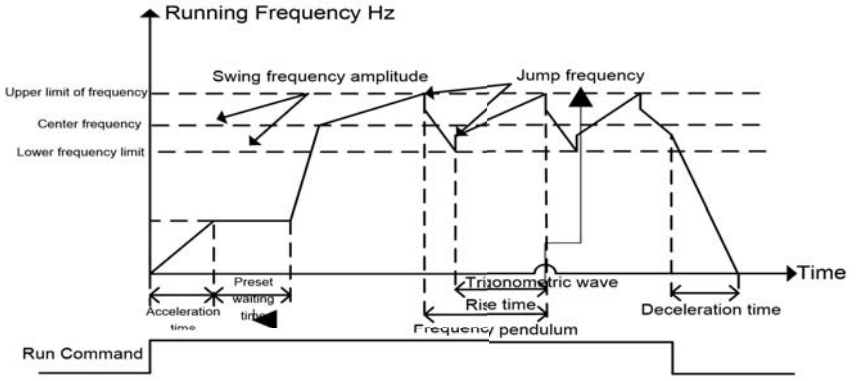
No.	Parameter description	Setting range	Factory value
	Other reference phase 0 settings		
F52.08	**Stage 3 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	The running time of a simple PLC third section is set, and the time unit is set by the 1000 bits of F52.00.		
F52.09	**phase 4 setting**	**000—327**	**【000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 4 (F51.04) Other reference phase 0 settings		
F52.10	**Stage 4 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC fourth section, the unit of time is set by the 1000 bits of F52.00		
F52.11	**PLC phase 5 setting**	**000—327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 5 (F51.05) Other reference phase 0 settings		
F52.12	**Stage 5 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	The running time of a simple PLC fifth section is set, and the time unit is set by the 1000 bits of F52.00.		
F52.13	**PLC phase 6 setting**	**000—327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 6 (F51.06) Other reference phase 0 settings		
F52.14	**Stage 6 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	The running time of a simple PLC sixth section is set, and the time unit is set by the 1000 bits of F52.00.		
F52.15	**PLC phase 7 setting**	**000—327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 7 (F51.07) Other reference phase 0 settings		
F52.16	**Stage 7 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC seventh section, the unit of time is set by the 1000 bits of F52.00.		
F52.17	**PLC phase 8 setting**	**000—327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 8 (F51.08) Other reference phase 0 settings		
F52.18	**Stage 8 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC eighth section, the unit of time is set by the 1000 bits of F52.00		
F52.19	**PLC phase 9 setting**	**000—327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 9 (F51.09) Other reference phase 0 settings		
F52.20	**Stage 9 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC ninth section, the unit of time is set by the 1000 bits of F52.00		
F52.21	**PLC phase 10 setting**	**000—327**	**000**
	Single bit: simple PLC phase running frequency 0: multi segment frequency 10 (F51.10) Other reference phase 0 settings		
F52.22	**Stage 10 running time**	**0.0s(min)—3276.7s(min)**	**0.0(min)**

No.	Parameter description	Setting range	Factory value
	Set the run time of a simple PLC tenth section, the unit of time is set by the 1000 bits of F52.00		
F52.23	**PLC phase 11 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency **0: multi segment frequency 11 (F51.11)** **Other reference phase 0 settings**		
F52.24	**Stage 11 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC eleventh section, the unit of time is set by the 1000 bits of F52.00		
F52.25	**PLC phase 12 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency **0: multi segment frequency 12 (F51.12)** **Other reference phase 0 settings**		
F52.26	**Stage 12 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC twelfth section, the unit of time is set by the 1000 bits of F52.00		
F52.27	**PLC phase 13 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency **0: multi segment frequency 13 (F51.13)** **Other reference phase 0 settings**		
F52.28	**Stage 13 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC thirteenth section, the unit of time is set by the 1000 bits of F52.00		
F52.29	**PLC phase 14 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency **0: multi segment frequency 14 (F51.14)** **Other reference phase 0 settings**		
F52.30	**Stage 14 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC fourteenth section, the unit of time is set by the 1000 bits of F52.00		
F52.31	**PLC phase 15 setting**	**000－327**	**000**
	Single bit: simple PLC phase running frequency **0: multi segment frequency 15 (F51.15)** **Other reference phase 0 settings**		
F52.32	**Stage 15 running time**	**0.0s(min)－3276.7s(min)**	**0.0(min)**
	Set the run time of a simple PLC fifteenth section, the unit of time is set by the 1000 bits of F52.00		
	Note: when the run time of a section is set to 0, the PLC function is invalid.		

6.6.4 Group F53 Pendulum frequency and fixed length

According to the acceleration time of acceleration to the swing frequency preset frequency (F53.02) and wait for a period of time (F53.03), then press the deceleration time to swing frequency center frequency, and then press the swing frequency amplitude setting (F53.04), frequency (F53.05), (F53.06) and periodic oscillation frequency of triangular wave (rise time F53.07) cycle operation, until the shutdown command according to the deceleration time shutdown date.

The pendulum frequency process is shown in the following diagram.



No.	Parameter description	Setting range	Factory value
F53.00	**Swing frequency function selection**	**0—1**	**0**
	0: do not use pendulum frequency function 1: use swing frequency function		
F53.01	**Swing frequency operation mode**	**0000—1111**	**0000**
	Single bit: starting mode 0: automatic mode After starting, it runs a period of time (F53.03) at the swing frequency (F53.02), and then automatically enters the swing frequency operation. 1: terminal manual When the multifunction input terminal is set for No. 52 function (swing frequency input function), and when the signal is valid, it enters the pendulum frequency state. When null and void, the pendulum frequency state is exited, and the operating frequency is kept at the swing frequency preposition frequency (F53.02). 10 bits: swing control 0: relative to the pendulum frequency center frequency 1: relative to the maximum output frequency 100 bits: selection of starting mode of swing frequency stop 0: start starting again 1: start by the state of memory before the shutdown 1000 bit: pendulum frequency state power down storage 0: power off scavenging state frequency state 1: power down storage and pendulum state		
F53.02	**Frequency preset frequency**	**0.00Hz—Max. frequency**	**0.00Hz**
F53.03	**Frequency preset frequency waiting time**	**0.0s—999.9s**	**0.0s**
	F53.02 defines the frequency of the drive before the pendulum frequency running state. F53.03 is set up before the pendulum frequency state, in order to swing the frequency of the frequency to run the duration of the frequency. It is effective only when the automatic input method is selected (the F53.01 bit is set 0).		
F53.04	**Swing frequency amplitude**	**0.0%—100.0%**	**0.0%**
	Relative to the central frequency of the pendulum frequency: FW = central frequency * F53.04.		

No.	Parameter description	Setting range	Factory value
	The frequency of the pendulum frequency is the frequency value set by the F00.01 (frequency set channel selection). Relative to the maximum output frequency: FW = maximum output frequency F00.07 x F53.04.		
F53.05	**Jump frequency**	**0.0%－50.0%**	**0.0%**
	The percentage relative to the amplitude of the pendulum frequency. Set to 0 Non jump frequencies		
F53.06	**Frequency cycle**	**0.1s－6000.0s**	**10.0s**
	A complete period of time defining the rise and fall of the pendulum		
F53.07	**Triangular wave rising time**	**0.1%－100.0%**	**5.0%**
	Operation time of the swing frequency rising and descending phase is defined, compared with the F07.06 swing frequency period. Unit s. Running time of the rising stage = F53.06 x F53.07. Running time of the descent phase = F53.06 * (1 - F53.07).		
F53.08	**Set count value**	**1－65535**	**1000**
F53.09	**Specified count value**	**1－F53.08**	**1000**
	F53.08 defines a multi-function input terminal (set 47 function) to input several pulses. When the number of pulses is input, the multi-function output terminal or relay outputs an indication signal, and the external counter is also automatically cleared. F53.09 defines a multi-function input terminal (set 47 function) to input several pulses. When the number of pulses is input, the multi-function output terminal or relay outputs an indication signal until the setting count value reaches.		
F53.10	**Length options**	**0000－1111**	**0000**
	Number of bits: length of arrival 0: continue to run 1: downtime 10 bits: a unit of length 0: meter 1:10 M 100 bit: length stop clearing 0: null and void 1: action 1000 bits: counting down and clearing zero 0: null and void 1: action		
F53.11	**Set length**	**0m－65535m**	**0m**
F53.12	**Pulse number per meter**	**0.1－6553.5**	**1000.0**

6.7 **Group U Monitoring Parameters**

6.7.1 U00 State monitoring parameters

No.	Parameter description	Setting range	Factory value
U00.00	**Input terminal**	**000－7FF**	**Actual value**
	Bit0 - Bit7 corresponding X1-X8 Bit8 - Bit10 corresponding AI1-AI3 0: the input terminal and the public end disconnect 1: the input terminal is connected to the public end		

No.	Parameter description	Setting range	Factory value
U00.01	Output terminal	00－33	Actual value
	Bit0 - Bit1 corresponds to Y1~Y2 Bit2 - Bit3 corresponds to RL1-RL2 0: the output terminal and the public end disconnect 1: the output terminal is connected to the public end		
U00.02	Machine state	00－2F	Actual value
	Single bit: Bit0: run / stop Bit1: forward / reverse Bit2: DC brake Bit3: parameter identification 10 bits: 0: constant speed 1: acceleration 2: deceleration		
U00.03	Output speed	0rpm－60000rpm	Actual value
U00.04	output frequency	0.01Hz－300.00Hz	Actual value
U00.05	Set frequency	0.01Hz－300.00Hz	Actual value
U00.06	Operating frequency	0.01Hz－300.00Hz	Actual value
U00.07	Synchro frequency	0.01Hz－300.00Hz	Actual value
U00.08	Local frequency	0.01Hz－300.00Hz	Actual value
U00.09	Expansion frequency	0.01Hz－300.00Hz	Actual value
U00.10	Busbar voltage	0V－6000V	Actual value
U00.11	output voltage	0V－6000V	Actual value
U00.12	Output current	0.0A－6000.0A	Actual value
U00.13	output power	0.0kw－6000.0kw	Actual value
U00.14	Output torque	-300%－300.0%	Actual value
U00.15	Given torque	-300%－300.0%	Actual value
U00.16	AI1 voltage	-10.00V－10.00V	Actual value
U00.17	AI2 voltage	-10.00V－10.00V	Actual value
U00.18	AI3 voltage	-10.00V－10.00V	Actual value
U00.19	AIP voltage	-10.00V－10.00V	Actual value
U00.20	AO1 voltage	0.00V－10.00V	Actual value
U00.21	AO2 voltage	0.00V－10.00V	Actual value
U00.22	PID given	-100.00－100.00%	Actual value
U00.23	PID feedback	-100.00－100.00%	Actual value
U00.24	PID error	-100.00－100.00%	Actual value
U00.25	PLC stage	0－15	Actual value
U00.26	Master setup channel	0－11	Actual value
U00.27	Auxiliary setup channel	0－9	Actual value
U00.28	Master set frequency	0.01Hz－300.00Hz	Actual value
U00.29	Auxiliary setting frequency	0.01Hz－300.00Hz	Actual value
U00.30	External count	0 －65535	Actual value
U00.31	Set length value	0m－65535m	Actual value
U00.32	Run length value	0m－65535m	Actual value
U00.33	Run line speed	0m－65535m	Actual value
U00.34	DI input frequency	0Hz－60000Hz	Actual value

No.	Parameter description	Setting range	Factory value
U00.35	D DO output frequency	0Hz－60000Hz	Actual value
U00.36	Radiator temperature	0.0℃－999.9℃	Actual value
U00.37	Motor temperature	0.0℃－999.9℃	Actual value
U00.38	AI1 sampling value	-10.00V－10.00V	Actual value
U00.39	AI2 sampling value	-10.00V－10.00V	Actual value
U00.40	AI3 sampling value	-10.00V－10.00V	Actual value
U00.41	AIP sampling value	-10.00V－10.00V	Actual value
U00.42	Current fault code	0－100	Actual value
U00.43	Power-on time Accumulative	0h－65535h	Actual value
U00.44	Running time accumulative	0h－65535h	Actual value
U00.45	Motor accumulative high energy consumption	0kw.h－59999kw.h	Actual value
U00.46	Motor accumulative low energy consumption	0.0kw.h－999.9kw.h	Actual value
U00.47	High energy consumption in this operation	0kw.h－59999kw.h	Actual value
U00.48	Low energy consumption in this operation	0.0kw.h－999.9kw.h	Actual value

6.7.2 U01 Fault record

No.	Parameter description	Setting range	Factory value
U01.00	Last fault code	0－39	Actual value
	01 Err.01: Accelerated overcurrent 02 Err.02: Deceleration overcurrent 03 Err.03: Constant speed overcurrent 04 Err.04: Accelerated overvoltage 05 Err.05: Decelerationovervoltage 06 Err.06: Constant speed overvoltage 07 Err.07: External trigger fault 08 Err.08: Current detection fault 09 Err.09: Sensitive signal failure 10 Err.10: Module detection fault 11 Err.11: Drive overheating 12 Err.12: Motor overheating 13 Err.13: Drive overload 14 Err.14: motor overload 15 Err.15: VFD undervoltage 16 Err.16: Drive input phase deficiency/short phase 17 Err.17: Drive output phase deficiency 18 Err.18: Drive output off load 19 Err.19: Drive tuning timeout 20 Err.20: Drive to ground short circuit 21 Err.21: Contactor suction failure 22 Err.22: EEPROM read and write failure 23 Err.23: Communication timeout fault 24 Err.24: Power up time 25 Err.25: Runtime arrival		

No.	Parameter description	Setting range	Factory value
	26 Err.26: PID Given loss 27 Err.27: PID Feedback loss 28 Err.28: Excessive velocity deviation 29 Err.29: Motor supervelocity 30 Err.30: Encoder failed 38 Err.38: Speed tracking fault 39 Err.39: Parameter copy fault		
U01.01	**Given frequency for last fault**	**0.00Hz－300.00Hz**	Actual value
U01.02	**Output frequency of the last fault**	**0.00Hz－300.00Hz**	Actual value
U01.03	**Output current of the last fault**	**0.0A－6000.0A**	Actual value
U01.04	**DC bus voltage in the last fault**	**0V－9999V**	Actual value
U01.05	**Output voltage during the last fault**	**0V－999V**	Actual value
U01.06	**Input terminal state during the last fault**	**00－7F**	Actual value
U01.07	**Output terminal state of the last fault**	**00－3F**	Actual value
U01.08	**Operating state of the machine during the last fault**	**00－2F**	Actual value
U01.09	**Last fault radiator temperature**	**0.0℃－999.9℃**	Actual value
U01.10	**Cumulative running time of the last fault**	**0.0h－6553.5h**	Actual value
U01.11	**Previous fault code**	**Same as U01.00**	Actual value
U01.12	**Cumulative running time of previous failure**	**0.0h－6553.5h**	Actual value
U01.13	**First two fault codes**	**Same as U01.00**	Actual value
U01.14	**Cumulative running time of the first two failures**	**0.0h－6553.5h**	Actual value
U01.15	**First three fault codes**	**Same as U01.00**	Actual value
U01.16	**Cumulative operation time of three failures before the cumulative run time of the previous three failures**	**0.0h－6553.5h**	Actual value

6.7.3 U02 Machine and software version information

No.	Parameter description	Setting range	Factory value
U02.00	**Drive rated power**	**0.0kW－6000.0kw.h**	**Model determination**
U02.01	**Rated voltage of drive**	**0V－2000V**	**Model determination**
U02.02	**Drive rated current**	**0.0A －6000.0A**	**Model determination**
U02.03	**Drive software series**	**TIxxx－TIxxx**	**Model determination**
U02.04	**Drive function version**	**1.00－99.99**	**Actual value**
U02.05	**Drive performance version**	**1.00－99.99**	**Actual value**
U02.06	**Drive production year**	**2000－2999**	**Actual value**
U02.07	**Drive production month and date**	**01/01－12/31**	**Actual value**
U02.08	**Custom-made serial number**	**00－9999**	**Actual value**
U02.09	**Custom-made non - label**	**00－9999**	**Actual value**
U02.10	**Keyboard software version**	**0.00－99.99**	**Actual value**

Chapter 7 Fault countermeasure & Exception handling

When the VFD fails, the operation panel has a fault alarm display screen, while the failure relay acts, the VFD stops output, and the motor stops at any time.

After the fault alarm, the fault phenomenon should be recorded in detail, and the fault detection and clearance should be carried out with reference to table 7-1. If you need technical support, please contact the supplier or email to service@thinkvert.com directly.

After the failure is excluded, it can be reset through the following ways:

1. Operation panel reset.
2. External reset terminal (multi-function terminal set to function 11) reset.
3. Communication mode fault reset.
4. Make the VFD completely out of the power after power loss

Table 7-1

Fault record SN#	Fault code	Fault name	Possible cause of failure	Solution
01	Err.01	Accelerated overflow	• Drive and motor wiring is not correct • Incorrect motor parameters • Drive power selection is smaller • Deceleration time is too short • Instantaneous stop happens, restart the motor in the rotation	• Correcting drive and motor wiring • Setting up the correct motor parameters (F10.00 - F10.07) • Select the appropriate drive power • Setting appropriate acceleration and deceleration time (F02.00 - F02.07)
02	Err.02	Deceleration overflow		
03	Err.03	Constant velocity overflow		
04	Err.04	Acceleration overvoltage	• High input voltage • Deceleration time is too short • Non standard wiring leads to hardware overvoltage • Instantaneous stop happens, restart the motor in the rotation • Improper selection of brake components	• check the input power supply voltage • set the appropriate deceleration time (F02.01, F02.03, F02.05, F02.07) • check the wiring of the system and standardize the wiring
05	Err.05	Deceleration overpvoltage		
06	Err.06	Constant speed overvoltage		
07	Err.07	External equipment failure	• External device fault terminal action	• External equipment inspection
08	Err.08	Current detection fault	• Drive board and control board loose line loosening • Damage of current detection circuit	• Check the connection • Contact the manufacturer for maintenance
09	Err.09	Sensitive signal failure	• Drive three-phase output broken line or phase missing phase • Heavy unbalanced three-phase loads with the drive	• Check the connection between the drive and the motor • Check motor quality

Fault record SN#	Fault code	Fault name	Possible cause of failure	Solution
10	Err.10	Power module failure	• Interphase output short circuit • Ground short circuit • Output current is too large • Power module damage	• Check wiring, regulate wiring • Check wiring and machinery • Contact manufacturer for maintenance
11	Err.11	Heatsink overheating	• Environmental temperature exceeds specification requirements • Drive external ventilation • Fan failure • Temperature detection circuit failure	• Reduced use, power amplification • Rectify the external ventilation of the VFD • Replace the fan • Seek technical support
12	Err.12	Motor overheating	• Motor overheating • Error setting of motor parameters	• Reduce load; repair and replace motor; • Increase of deceleration time (F02.00-F02.07) • Set the correct parameters of the motor (F10.00-F10.07)
13	Err.13	Drive overload	• Acceleration time setting is too short • V/F curve or torque lifting is unsuitable for excessive current • Instantaneous stop occurs, restarting the motor in the rotation • Low voltage of power grid • Oversize motor load	• Adjust the acceleration time (F02.00, F02.02, F02.04, F02.06) • Adjust the motor V/F curve (F20.00F20.08), torque (F11.09) • Check the input grid voltage • Choose a power matching VFD
14	Err.14	Motor overload	• Improper setting of V/F curve • Low voltage of power grid • Long term operation of low speed and large load of non frequency conversion common motor • Motor plugging operation or overload	• Adjust the motor V/F curve right (F20.00F20.08) • Check the input power • Long term low speed and large load operation, change the frequency conversion motor • Check load and mechanical drive
15	Err.15	VFD under-voltage	• DC bus voltage low	• Check whether the input voltage is too low or the drive is in the power down process
16	Err.16	Drive input phase deficiency	• Three phase input power supply is out of phase for three phase input drive,	• Check three phase input power supply • Seek technical support
17	Err.17	Drive output phase deficiency	• Drive three-phase output broken line or phase missing phase • Three-phase load is seriously unbalanced with the drive	• Check the connection between the VFD and the motor • Check the quality of the motor
18	Err.18	Drive output	• Load or sudden disappearance	• Check load and mechanical

Fault record SN#	Fault code	Fault name	Possible cause of failure	Solution
		off load	• Improper setting of parameters	drive • Set the appropriate parameters (F04.05F04.07)
19	Err.19	Drive tuning timeout	• The motor parameters are not set according to the nameplate • Parameter identification process timeout	• Correctly set the motor parameters according to nameplate • Check the wiring of the drive to motor
20	Err.20	Drive to ground short circuit	• Wiring error • Motor anomaly • Abnormity of inverter module • Drain current is too large in output side of the drive	• Check the wiring • Insulation test for motor • Seek technical support
21	Err.21	Power buffer contactor unabsorbed	• Contactor failure • Control circuit fault	• Replacement contactor • Seek technical support
22	Err.22	Operation panel EEPROM read and write failure	• Operation panel EEPROM storage circuit failure	• Replace the operation panel • Contact the manufacturer for maintenance
23	Err.23	SCI Communicatio n timeout	• Communication cable connection error • Disconnection or loosening of communication cable	• Check wiring
26	Err.26	PID Given loss	• Simulation of a given signal is less than F50.24 • Analog input circuit fault	• Inspection connection • Seek technical support
27	Err.27	PID Feedback loss	• Analog feedback signal is less than F50.26 • Analog input circuit fault	• Inspection connection • Seek technical support
28	Err.28	Excessive velocity deviation	• Error setting of the motor speed and the set speed is too small • Load fluctuates too much • Parameter setting of vector control is not reasonable	• Set the speed deviation point correctly • Stable load • Correctly setting the vector control parameters
29	Err.29	Supervelocity of motor	• Parameter setting of the encoder is not reasonable • No parameter identification • Unreasonable setting of motor speed detection	• Setting the encoder parameters correctly • Motor parameters Identification • Setting up testing parameters according to actual situation
30	Err.30	Encoder failed	• Encoders have no signal or lack of signal • Encoder connection line disconnection	• Check whether the encoder is damaged or the power supply is abnormal • Reconnect encoder

Fault record SN#	Fault code	Fault name	Possible cause of failure	Solution
			• Encoder connection error	
38	Err.38	Speed tracking fault	• Parameter setting is not reasonable • Abnormal speed tracking card	• Reset the parameters • Change speed tracking card
39	Err.39	Parameter copy fault	• The software version of the main control board is inconsistent • Inconsistencies in the software version of the operation panel	• Replacement of main control board • Replace the operation panel

Chapter 8 Repair and maintenance

Due to influence of ambient temperature, humidity, dust and vibration, as well as aging of internal devices of the drive, all above factors may cause potential faults of the drive. Therefore, it is necessary to carry out routine and periodic maintenance during storing and using the drive..

- If the drive undergoes a long-distance transportation, it must take routine check whether the product components is complete, and whether the screws are fastening before using it.
- During using the drive, need clean dust of internal drive regularly and check whether internal fastening screws is loose.

DANGER

- Only such professionals who are trained and qualified by authorization can maintain the drive.
- Before maintenance, personnel must remove the metal accessories. Must used the insulation of clothing and tools that conform to the requirements in maintenance.
- The high voltage inside the drive is still dangerous when the drive is in charged or running.
- Before inspecting and maintaining the drive, disconnect input power reliably, and wait at least ten minutes. Confirmed that all lights of VFDs internal charge indicator and operation panel have been extinguished, open the drive plate for maintenance after power terminal voltage between(+) and (-) is less than 36V.

WARNING

- For the VFD stored more than 2 years, should boost slowly through the voltage regulator to power up when powers on.
- Don't leave nail wire, tools, screws such metal objects in the internal of VFDs.
- Please do not to modify the internal of drive without authorization.
- IC components inside of drive are sensitive to static electricity, please do not directly touch the components on the devices.

8.1 Routine Repair and Maintenance

The VFD must run in the specified environment, in addition, accidents may also occur in running. Therefore, users should do routine maintenance work according to table 8-1 inspection items.

Keep a good running environment, record daily running, and find abnormal phenomenon in time, which can prolong the service life of the drive

8-1 Daily inspection item

Inspecting objects	Inspecting content	judgment standard
Running environment	Temperature and humidity	-10-+40℃,derating use when 40－60℃
	Dust, water and dripping	No water leakage trace
	Gas	No odor

Inspecting objects	Inspecting content	judgment standard
Drive	Vibration and heating	Stable vibration, wind and temperature is reasonable
	Noises	No unusual noises
Motor	Heating	No abnormal heating
	Noises	Noises are well-distributed
Running state parameters	Output current	In rated scope
	Output voltage	In rated scope

8.2 Regular maintenance

According to the using environment, the user can do a regular routine inspection on the VFD in 3-6 months, in order to eliminate hidden dangers, to ensure the equipments keep in long-term performance and stability.

Inspection contents including:

- Check whether intakes of the radiator is blocked, use blower gun to remove greasy dirt, dust, dust and battings in the intakes of the radiator;
- Clean oil pollution, dust and battings on the fan blade;
- Check whether the screws of control terminal loose, if yes, need use a available torque and suitable size of screws to tighten it;
- Check whether power terminal is bad contact, and an overheating trace on copper platoon or in cable connection.
- Check whether Power cable and control cable are damaged, especially check whether there is a cut trace on the skin of metal surface contact;
- Check whether power cables and control signal nose line insulation binder is off or broken

Note:

1. VFD has been passed withstand voltage test before leaving factory, users no need redo the test, otherwise, the VFD may be damaged by improper test.
2. If the motor do insulation test, test the motor separately after the input terminal U/V/W apart from the VFD, otherwise the VFD may be damage.
3. VFDs storage long time should re-activation as follows:

Time	Operational principle
Storing time less than 1 year	Operation without charging
Storing time 1-2 years	Connect with the power for 1 hour before first ON command
Storing time 2-3 years	Use power surge to charge for the VFD • Add 25% rated voltage for 30 minutes • Add 50% rated voltage for 30 minutes • Add 75% rated voltage for 30 minutes • Add 100% rated voltage for 30 minutes
Storing time more than 3 years	Use power surge to charge for the VFD • Add 25% rated voltage for 2 hours • Add 50% rated voltage for 2 hours • Add 75% rated voltage for 2 hours • Add 100% rated voltage for 2 hours

8.3 Quick-wore parts replacement

VFD quick-wore parts mainly include cooling fan and filtering electrolytic capacitor, its life is closely related to using environment and the status of the maintenance, user can change age limit according to running time setting..

Cooling fan

Lifetime: 30～40 thousand hours

Potential damage reason: bearing wear, fan blade aging.

Judging criteria: When VFD powers off, check whether the fan blade has cracks; when VFD in charged, check whether the fan works normally, whether there is abnormal vibration and noises, etc.

Filtering electrolytic capacitor

Lifetime: 40～50 thousand hours

Potential damage reason: The environment temperature is higher, frequent load jump caused to pulse electric current increasing and electrolyte aging.

Judging criteria: Check whether drive under load running often appears faults of over-current, over-voltage, etc; whether has liquid leakage, the relief valve is protruding or not, electrostatic capacitance measurement and insulation resistance measurement.

8.4 Scrap Disposal

Note for disposing scrap:

The electrolytic capacitor inside the drive may explode when burning..

Plastic parts can produce poisonous gas when burning.

Please take it as industrial waste to dispose.

Chapter 9 Function code parameter table

Attribute modification:

"*": Actual parameters cannot be modified.

"×": It cannot be modified during running.

"○": It can be modified during running.

"—": Parameters with same mapping function.

❖: Refers to this parameter is valid only in matching corresponding expansion card.

Function code	Name	Setting range	Factory preset	Modify attribute
F00 Frequency given parameter				
F00.00	Frequency master given number setting	0.00Hz-Upper frequency	50.00Hz	○
F00.01	Frequency master given	0: digital given (F00.00) +UP/DN regulation 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: process PID 6: simple PLC 7: multistage speed 8: Communication given 9: panel potentiometer 10: local orthogonal pulse input 11: local symbol pulse input	0	○
F00.02	Frequency assisted given number setting	0.00Hz－Upper frequency	50.00Hz	○
F00.03	Frequency assisted given mode	0: no given 1: digital given (F00.02) +UP/DN regulation 2: analog input AI1 3: analog input AI2 4: analog input AI3 5: pulse given (DI) 6: process PID 7: simple PLC 8: multistage speed 9: Communication given	0	○
F00.04	Frequency supplemented reference selection	0: the equivalent of maximum frequency 1: the equivalent of a given frequency source	0	○
F00.05	Frequency	0.0%－200.0%	100.0%	○

Function code	Name	Setting range	Factory preset	Modify attribute
	auxiliary given coefficient			
F00.06	Frequency main auxiliary superposition selection	Single bit: frequency given 0: frequency master given 1: the result of the given operation of the frequency master and auxiliary 2: frequency master given and frequency assisted switching 3: switching between the main frequency and the main and auxiliary operation results 4: switching between frequency auxiliary and main operation 10 bits: a given operation relationship of frequency main and auxiliary 0: Main + auxiliary 1: main and auxiliary 2:Max{master, auxiliary} 3:Min{master, auxiliary} 100 bits: frequency main auxiliary operation symbol limit 0: null and void 1: effective	100	○
F00.07	Maximum frequency	Upper frequency－300.00Hz	50.00Hz	×
F00.08	Upper frequency	Upper frequency-Max. frequency	50.00Hz	×
F00.09	Lower frequency	0.00Hz －Upper frequency	0.00Hz	×
F00.10	Jump frequency 1	0.00Hz－Upper frequency	0.00Hz	×
F00.11	Jump range 1	0.00Hz－30.00Hz	0.00Hz	×
F00.12	Jump frequency 2	0.00Hz－Upper frequency	0.00Hz	×
F00.13	Jumping range 2	0.00Hz－30.00Hz	0.00Hz	×
F00.14	Jump frequency 3	0.00Hz－Upper frequency	0.00Hz	×
F00.15	Jumping range 3	0.00Hz－30.00Hz	0.00Hz	×
F00.16	Point moving frequency setting	0.00Hz－Upper frequency	5.00Hz	×
F01 Start and stop control parameters				

Function code	Name	Setting range	Factory preset	Modify attribute
F01.00	Run command given	0: operation panel command mode (MON bright) 1: terminal command mode (MON extinguish) 2: communication command mode (MON flicker) 3: multi segment command mode (MON bright)	0	○
F01.01	Command given bundled frequency source	Single bit: panel command binding frequency source selection 10 bits: terminal command binding frequency source selection 100 bits: communication command binding frequency source selection 0: no binding 1: digital given (F00.00) +UP/DN regulation 2: analog input AI1 3: analog input AI2 4: analog input AI3 5: pulse given (DI) 6: process PID 7: simple PLC 8: multistage speed 9: Communication given	000	×
F01.02	Running direction selection	0: the same direction 1: reverse direction	0	×
F01.03	Anti reversal selection	0: allowable reversal 1: Prohibition of reversal	0	×
F01.04	Positive inversion dead zone time	0.0s－3600.0s	0.0s	×
F01.05	starting mode selection	0: starting from starting frequency 1: first braking and starting from starting frequency 2: first tracking and then starting from search frequency (software) 3: first tracking and then starting from search frequency (hardware)	0	×
F01.06	Starting frequency setting	0.00Hz－Upper frequency	0.50Hz	×
F01.07	Starting frequency retention time	0.0s－3600.0s	0.0s	×
F01.08	Starting DC brake current	0.0%－100.0%	0.0%	×
F01.09	Starting DC braking time	0.00s－30.00s	0.00s	×
F01.10	Shutdown mode selection	0: deceleration stop 1: a free stop	0	×

Function code	Name	Setting range	Factory preset	Modify attribute
		2: deceleration stop + DC brake		
F01.11	Stop DC brake start frequency	0.00Hz－Upper frequency	0.50Hz	×
F01.12	Stop DC brake current	0.0%－100.0%	0.0%	×
F01.13	Stop DC braking time	0.00s－30.00s	0.00s	×
F01.14	Frequency multiplying rate for speed tracking	50.0%－150.0%	100.0%	×
F01.15	Minimum interval time for speed tracking	0.1s－20.0s	3.0s	×
F02 Acceleration and deceleration parameters				
F02.00	Acceleration time 1	0.1s－6000.0s	Model determination	○
F02.01	Deceleration time 1	0.1s－6000.0s		○
F02.02	Acceleration time 2	0.1s－6000.0s	Model determination	○
F02.03	Deceleration time 2	0.1s－6000.0s	Model determination	○
F02.04	Acceleration time 3	0.1s－6000.0s	Model determination	○
F02.05	Deceleration time 3	0.1s－6000.0s	Model determination	○
F02.06	Acceleration time 4	0.1s－6000.0s	Model determination	○
F02.07	Deceleration time 4	0.1s－6000.0s	Model determination	○
F02.08	Emergency shutdown time	0.1s－6000.0s	Model determination	×
F02.09	Point moving acceleration time	0.1s－6000.0s	Model determination	×
F02.10	Point moving deceleration time	0.1s－6000.0s	Model determination	×
F02.11	acceleration and deceleration curve selection	0: linear acceleration and deceleration 1: line and deceleration 2: curve and deceleration	0	×
F02.12	Speed switching frequency of folding and decelerating	0.00Hz－Upper frequency	0.00Hz	×
F02.13	Switching frequency of folding and decelerating deceleration time	0.00Hz－Upper frequency	0.00Hz	×
F02.14	Accelerate the start curvature	0% － 200% (curve plus deceleration)	50%	×

Function code	Name	Setting range	Factory preset	Modify attribute
F02.15	Speed up ending curvature	0% — 200% (curve plus deceleration)	50%	×
F02.16	Accelerating intermediate slope	0% — 200% (curve plus deceleration)	0%	×
F02.17	Deceleration start curvature	0% — 200% (curve plus deceleration)	50%	×
F02.18	Deceleration end curvature	0% — 200% (curve plus deceleration)	50%	×
F02.19	Deceleration intermediate slope	0% — 200% (curve plus deceleration)	0%	×
F03 Communication parameters				
F03.00	Local address	0—247,0 is for broadcast addresses	001	○
F03.01	Baud rate selection	0: 4800bps 1: 9600bps 2: 19200bps 3: 38400bps 4: 57600bps 5: 115200bps Single bit: communication port communication baud rate selection 10 bits: communication baud rate selection for extended port communication 100 bits: the choice of communication baud rate of keyboard port 0:4800bps 1:9600bps 2:19200bps 3:38400bps 4:57600bps 5:115200bps	311	○
F03.02	Data format	Single digits: data format selection of communication port 10 bits: extension data format selection 100 bits: the selection of the data format of the keyboard 0:1-8-1-N format, RTU 1:1-8-1-E format, RTU 2:1-8-1-O format, RTU 3:1-7-1-N format, ASCII 4:1-7-1-E format, ASCII 5:1-7-1-O format, ASCII	000	○
F03.03	Local response delay	0.000s—60.000s	0.000s	○
F03.04	Communication timeout detection time	0.0s—3600.0s 0.0s: Non detection of communication timeout	0.0s	○

Function code	Name	Setting range	Factory preset	Modify attribute
F03.05	Communication error response shielding selection	Single bit: communication port error response shielding selection 10 bits: screening selection for extended mouth error response 100 bits: keyboard mouth error response shielding selection 0: effective 1: null and void	000	○
F03.06	master and slave mode selection and slave function code selection	0: F00.00 1: F50.01 Single bit: the master and slave of the communication port 10 bits: primary and subordinate selection of the extended mouth 0: single machine use 1: This machine is used as the host 2: This machine is used as a slave machine 100 bits: the selection of the operating object of the communication port 1000 bit: selection of extended port operating object 0:F00.00 1:F50.01	0000	×
F03.07	Host operation from machine interval time	0.010s－1.000s	0.050s	○
F03.08	Frequency ratio coefficient of receiving frequency from machine	0.00－10.00	1.00	○
F03.09	Communication special function	Single bit: EEPROM write enable 0: null and void 1: effective 10 bits: Custom address enabled 0: null and void 1: effective 100 bits: the oscilloscope is mapped to the terminal 0: null and void 1: effective 1000 bits: oscilloscope monitoring 0: monitoring closure 1: monitoring definition 2: monitoring function 3: monitoring performance 4: protocol communication	0001	○
F03.10	Oscillograph monitoring item	Single bit: CH1 monitoring item selection 10 bits: CH2 monitoring item selection 100 bits: CH3 monitoring item selection	7543	○

Function code	Name	Setting range	Factory preset	Modify attribute
		1000 bit: CH4 monitoring item selection 0: the default output is zero 1:M axis feedback current (unit: Q12) 2:T axis feedback current (unit: Q12) 3:U phase output current (unit: Q12) 4:V phase output current (unit: Q12) 5:W phase output current (unit: Q12) 6: effective output current (unit: Q12) 7: DC bus voltage (unit: 0.1V) 8: actual output voltage (unit: 0.1V) 9: given output frequency (unit:0.01Hz) A: ramp output frequency (unit:0.01Hz) B: actual output frequency (unit:0.01Hz) C: synchronous output frequency (unit:0.01Hz) D: the actual frequency of the rotor (unit:0.01Hz) E: feedback output torque (unit: 0.1%) F: given output torque (unit: 0.1%)		
F03.11	**Arbitrary definition of address 01**	0x0000 -- 0xFFFF	0x0000	×
F03.12	**Local corresponding address 01**	0x0000 -- 0xFFFF	0x0000	×
F03.13	**Arbitrary definition of address 02**	0x0000 -- 0xFFFF	0x0000	×
F03.14	**Local corresponding address 02**	0x0000 -- 0xFFFF	0x0000	×
F03.15	**Arbitrary definition of address 03**	0x0000 -- 0xFFFF	0x0000	×
F03.16	**Local corresponding address 03**	0x0000 -- 0xFFFF	0x0000	×
F03.17	**Arbitrary definition of address 04**	0x0000 -- 0xFFFF	0x0000	×
F03.18	**Local corresponding address 04**	0x0000 -- 0xFFFF	0x0000	×

Function code	Name	Setting range	Factory preset	Modify attribute
F03.19	**Arbitrary definition of address 05**	0x0000 -- 0xFFFF	0x0000	×
F03.20	**Local corresponding address 05**	0x0000 -- 0xFFFF	0x0000	×
F03.21	**Arbitrary definition of address 06**	0x0000 -- 0xFFFF	0x0000	×
F03.22	**Local corresponding address 06**	0x0000 -- 0xFFFF	0x0000	×
F03.23	**Arbitrary definition of address 07**	0x0000 -- 0xFFFF	0x0000	×
F03.24	**Local corresponding address 07**	0x0000 -- 0xFFFF	0x0000	×
F03.25	**Arbitrary definition of address 08**	0x0000 -- 0xFFFF	0x0000	×
F03.26	**Local corresponding address 08**	0x0000 -- 0xFFFF	0x0000	×
F03.27	**Arbitrary definition of address 09**	0x0000 -- 0xFFFF	0x0000	×
F03.28	**Local corresponding address 09**	0x0000 -- 0xFFFF	0x0000	×
F03.29	**Arbitrary definition of address 10**	0x0000 -- 0xFFFF	0x0000	×
F03.30	**Local corresponding address 10**	0x0000 -- 0xFFFF	0x0000	×
F04 Protection parameters				
F04.00	Motor overheating detection selection	Single bit: motor over temperature protection 0: prohibition 1: action 10 bits: sensor type 0: temperature sensor PT100 1: temperature sensor PT1000 100 bits: analog channel 0: analog input AI1 1: analog input AI2	000	×

Function code	Name	Setting range	Factory preset	Modify attribute
F04.01	Motor overheating detection level	0.0－200.0°C	85.0°C	×
F04.02	VFD overload forecast alarm detection selection	Single bit: overload warning detection selection 0: it has been tested during the operation 1: test only at constant speed 10 bits: selection of detectable amount of overload warning 0: the detection level is relative to the rated current of the motor (alarm: motor overload) 1: detection level relative to drive rated current (alarm: drive overload) 100 bits: overload protection selection 0: overload protection shielding 1: overload protection enabling	000	×
F04.03	VFD overload forecast detection level	20.0%－200.0%	160.0%	×
F04.04	Drive overload warning detection time	0.0s－60.0s	5.0s	×
F04.05	Drive out load detection selection	0: drive output off load detection is invalid 1: running inspection (alarm) 2: only at constant speed (alarm) 3: Inspection (fault) in operation 4: only at constant speed (fault)	0	×
F04.06	Drive output load drop detection level	0.0%－100.0%	30.0%	×
F04.07	Drive output load detection time	0.0s－3600.0s	1.0s	×
F04.08	Automatic reset times selection	0－100 0: No automatic reset function	000	×
F04.09	Automatic reset interval time	0.1s－100.0s	1.0s	×

Function code	Name	Setting range	Factory preset	Modify attribute
F04.10	Fault relay action selection	Single bit: automatic reset period 0: no action 1: action 10 bits: undervoltage period 0: no action 1: action	00	○
F04.11	Enhanced protection enabled options	Single bit: output phase detection 0: prohibition 1: action 10 bits: inputting phase detection 0: prohibition 1: action 100 bits: motor overload detection 0: prohibition 1: action 1000 bit: detection of ground short circuit 0: prohibition 1: action	0000	×
F04.12	Cooling fan control	0: automatic operation 1: direct operation after power supply 2: stop immediately after the shutdown	0	×
F04.13	Fault record latch	0: fault record reset when power off 1: fault record storage for power down	1	×
F04.14	Fault protection action selection 1	Single bit: EEPROM reading and writing failure 0: continue to run 1: free parking 10 bits: sensitive signal failure 0: continue to run 1: free parking 100 bits: contactor suction failure 0: continue to run 1: free parking 1000 bit: current detection fault 0: continue to run 1: free parking	1111	×

Function code	Name	Setting range	Factory preset	Modify attribute
F04.15	Fault protection action selection 2	Single bit: drive overheating 0: continue to run 1: free parking 10 bits: encoder failure 0: continue to run 1: free parking 100 bits: motor overheating 0: continue to run 1: free parking 1000 bits: undefined system 0: continue to run 1: free parking	1111	×
F05 Enhanced functional parameters				
F05.00	Carrier frequency setting	<= 15kW: 1.0kHz－16.0kHz,Factory value: 8.0kHz 18.5kW-45kW: 1.0kHz－10.0kHz,Factory value: 4.0kHz 55kW-75kW: 1.0kHz－ 8.0kHz,Factory value: 3.0kHz >=90kW: 1.0kHz－ 3.0kHz,Factory value: 2.0kHz	Model determination	×
F05.01	Carrier frequency options	Single bit: carrier frequency with noise adjustment coefficient Range: 0-F 10 bits: carrier frequency is adjusted with temperature 0: automatic adjustment 1: no adjustment 100 bits: carrier frequency adjustment with frequency 0: automatic adjustment 1: no adjustment	000	×
F05.02	PWM Optimization item	Single bit: PWM modulation mode 0: three phase modulation 1: two phase modulation 2: automatic switching 10 bits: over modulation regulation 0: action 1: null and void 100 bits: wave by wave current	1000	×

Function code	Name	Setting range	Factory preset	Modify attribute
		limiting mode 0: action 1: null and void 1000 bit: narrow pulse regulation 0: action 1: null and void		
F05.03	Over excitation brake selection	0: prohibition 1: action	1	×
F05.04	Energy consumption braking Selection	0: prohibition 1: action	0	×
F05.05	Energy consumption braking action voltage	650V－750V	720V	×
F05.06	Overvoltage stall selection	0: prohibition 1: action	1	×
F05.07	Overvoltage stall voltage	100.0%－150.0% (rated bus voltage)	135.0%	×
F05.08	Undervoltage stall selection	0: prohibition 1: action	0	×
F05.09	Undervoltage stall voltage	50.0%－95.0% (rated bus voltage)	85.0%	×
F05.10	Automatic current limiter action selection	0: prohibition 1: action	1	×
F05.11	Automatic limit flow limit level	20.0%－200.0% (rated bus voltage)	160.0%	×
F05.12	Automatic limit pressure coefficient adjustment	0: prohibition 1: action	0	×
F05.13	Special function	0: standard function 1: oil pumping unit function	0	×
F05.16	High frequency selection	0: 0~300HZ 1: 0~3200HZ	0	×
F05.17	Fundamental frequency suppression	0: prohibition 1: action	0	×
F10 Motor basic parameters				
F10.00	Selection of motor type	0: Asynchronous motor	0	×
F10.01	Motor control mode	0: simple vector control 1: no PG vector control 2: PG vector control	0	×
F10.02	Motor rated power	0.2kW－6000.0kW	Model determination	×
F10.03	Rated voltage of motor	1V－480V	380V	×
F10.04	Motor rated current	0.1A－6000.0A	Model determination	

Function code	Name	Setting range	Factory preset	Modify attribute
F10.05	Rated frequency of motor	10.00Hz－Max.frequency	50.00Hz	×
F10.06	Motor rated speed	1－65535 rpm	1500rpm	×
F10.07	Motor pole number	2－80	4	×
F10.08	Motor parameters Auto-tuning	0: no action 1: self tuning of current balance coefficient 2: static self-tuning of asynchronous motor 3: rotation self-tuning of asynchronous motor	0	×
F11 Asynchronous motor parameters				
F11.00	Stator resistance of asynchronous motor	0.000Ω－65.000Ω	Model determination	×
F11.01	Rotor resistance of asynchronous motor	0.001Ω－65.000Ω	Model determination	×
F11.02	Leakage inductance of asynchronous motor	0.0mH－6500.0mH	Model determination	×
F11.03	Induction motor mutual inductance	0.1mH－6500.0mH	Model determination	×
F11.04	No-load excitation current of asynchronous motor	0.1A－6000.0A	Model determination	×
F11.05	Magnetic saturation coefficient of asynchronous motor 1	0.00%－100.00%	Model determination	×
F11.06	Magnetic saturation coefficient of asynchronous motor 2	0.00%－100.00%	Model determination	×
F11.07	Magnetic saturation coefficient of asynchronous motor 3	0.00%－100.00%	Model determination	×
F11.08	Magnetic saturation coefficient of asynchronous motor 4	0.00%－100.00%	Model determination	×
F11.09	Magnetic saturation coefficient of asynchronous	0.00%－100.00%	Model determination	×

Function code	Name	Setting range	Factory preset	Modify attribute
	motor 5			
F20 V/F control parameters				
F20.00	V/F curve setting	0: line V/F 1: multi segment V/F 2:1.2 pow. 3:1.4 pow. 4:1.6 pow. 5:1.8 pow. 6:2.0 pow. 7: V/F separation	0	×
F20.01	V/F frequency value F0	0.00Hz－F20.03	0.00Hz	×
F20.02	V/F voltage value V0	0.0% －F20.04	0.0%	×
F20.03	V/F frequency value F1	F20.01－F20.05	0.00Hz	×
F20.04	V/F voltage value V1	F20.02－F20.06	0.0%	×
F20.05	V/F frequency value F2	F20.03－F20.07	0.00Hz	×
F20.06	V/F voltage value V2	F20.04－F20.08	0.0%	×
F20.07	V/F frequency value F3	F20.05－F10.05 (motor rated frequency)	50.00Hz	×
F20.08		F20.06－100.0%	100.0%	×
F20.09	Torque lifting	0.0%－30.0% 0.0%: Automatic torque lifting efficiency	0.0%	×
F20.10	Differential compensation gain	0.00－300.0%	100.0%	○
F20.11	Droop control value	0.00Hz－10.00Hz	0.00Hz	×
F20.12	Current limiting coefficient in weak magnetic region	0.001-1.000	0.500	○
F20.13	Energy saving efficiency	0.0%－40.0%	0.0%	○
F20.14	Inhibition of concussion coefficient 1	0－256	40	○
F20.15	Inhibition of concussion coefficient 2	0－256	40	○
F20.16	Selection of voltage given in V/F separation mode	0: F20.17 digital setting 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: process PID output 5: process PID output + AI1	0	×
F20.17	Voltage digital given in V/F separation	0.0%－100.0%	0.0%	○

Function code	Name	Setting range	Factory preset	Modify attribute
	mode			
F20.18	Voltage variation time of V/F separation mode	0.00s－600.00s	0.01s	○
F21 Vector control parameters				
F21.00	Speed / torque control selection	0-1	0	×
F21.01	ASR high speed proportional gain Kp	0.00 －30.00	2.00	○
F21.02	ASR high speed integral time Ti	0.000－10.000s	0.200s	○
F21.03	ASR low speed proportional gain Kp	0.00 －30.00	2.00	○
F21.04	ASR low speed integral time Ti	0.000－10.000s	0.200s	○
F21.05	ASR switching frequency 1	0.00Hz－F21.06	5.00Hz	○
F21.06	ASR switching frequency2	F21.05－Upper frequency	10.00Hz	○
F21.07	ASR input filter time (speed)	0.0ms－1000.0ms	0.3ms	○
F21.08	ASR output filter time (current)	0.0ms－1000.0ms	0.3ms	○
F21.09	ACR excitation proportional gain Kp	0 － 4000	1000	○
F21.10	ACR excitation integral gain Ki	0 － 4000	1000	○
F21.11	ACR torque proportional gain Kp	0 － 4000	1000	○
F21.12	ACR torque integral gain Ki	0 － 4000	1000	○
F21.13	Pre-excitation time	0.000s－5.000s	0.200s	○
F21.14	Electric transfer compensation gain	10.0%－200.0%	100.0%	○
F21.15	Brake slip compensation gain	10.0%－200.0%	100.0%	○
F21.16	Torque limiting coefficient in weak magnetic field	0.0%－100.0%	50.0%	○
F21.17	Torque control torque setting channel	6: Min{ AI1,AI2} 7: Max{ AI1,AI2} 0: number setting F21.18 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI)	0	×

Function code	Name	Setting range	Factory preset	Modify attribute
		5: Communication given 6:Min{AI1, AI2} 7:Max{AI1, AI2}		
F21.18	Torque control torque digital setting value	-200.0%－200.0%	0.0%	○
F21.19	Electric torque limited channel	0: number setting F21.20 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: Communication given	0	×
F21.20	Digital setting of electric torque limited value	0.0%－200.0%	180.0%	○
F21.21	Brake torque limited channel	0: number setting F21.22 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: Communication given	0	×
F21.22	Digital setting of brake torque limit value	0.0%－200.0%	180.0%	○
F21.23	Torque control forward speed limit channel	0: number setting F21.24 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: Communication given	0	×
F21.24	Torque control forward speed limit value	0.00Hz－Max. frequency	50.00Hz	○
F21.25	Torque control reverse speed limited channel	0: number setting F21.26 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: Communication give	0	×
F21.26	Torque control reversal speed limit value	0.00Hz－Max. frequency	50.00Hz	○
F21.27	Torque control torque setting and subtraction time	0.00s－200.00s	1.00s	○
F21.28	Static friction torque compensation	0.0%－100.0%	0.0%	○
F21.29	Sliding friction torque	0.0%－100.0%	0.0%	○

Function code	Name	Setting range	Factory preset	Modify attribute
	compensation			
F21.30	Compensation coefficient of moment of inertia	0.000－1.000	0.000	○
F21.31	Vector mode optimization options	Single Bit: feedforward compensation enabling Ten bit: magnetic flux auto adjustment 0: null and void 1: action	00	○
F22 Encoder parameter				
F22.00	Speed feedback encoder selection	0: local 1: expansion	0	×
F22.01	Local encoder line number	1－10000	2500	○
F22.02	Local encoder direction	0: positive 1: reverse	0	×
F22.03	Local encoder speed ratio molecular value	1－65535	1000	×
F22.04	Local encoder speed ratio parent value	1－65535	1000	×
F22.05	Local encoder broken line detection time	0.0s－8.0s 0.0s: No detection	2.0s	○
F22.06	Local encoder initial angle	0.00°－ 359.99°	0.00°	×
F22.07	Extended encoder type	0:ABZ encoder 1:UVW encoder 2: rotary transformer 3: cosine coder 4: absolute value encoder 5: provincial line encoder	0	×
F22.08	Extended encoder line number	1－10000	2500	○
F22.09	Extended encoder direction	Single bit: ABZ direction 10 bits: UVW direction 0: positive 1: reverse	00	×
F22.10	Molecular value of the speed ratio of the extended encoder	1－65535	1000	×
F22.11	Speed ratio parent value of extended encoder	1－65535	1000	×
F22.12	Extended encoder broken line detection time	0.0s－8.0s 0.0s:No detection	2.0s	○
F22.13	Expansion encoder initial angle	0.00°－ 359.99°	0.00°	×
F22.14	Extended	1－32	1	×

Function code	Name	Setting range	Factory preset	Modify attribute
	encoder pole logarithm			
F22.15	Overspeed detection value	0.0%－120.0% (relative maximum frequency)	120.0%	×
F22.16	Overspeed detection time	0.00s－20.00s 0.00s: No detection	0.00s	×
F22.17	Over deviation detection value	0.0%－50.0%	10.0%	×
F22.18	Over deviation detection time	0.00s－20.00s 0.00s: NO detection	0.00s	×
F30 Switch value input				
F30.00	Terminal detection	0: level effective 1: the edge is effective Number: BIT0 ~ BIT3:X1-X4 10 bits: BIT0 ~ BIT3:X5-X8 100 bits: BIT0 ~ BIT2:AI1-AI3	000	×
F30.01	X1 Terminal function selection	00: no function 01: forward running (FWD) 02: reverse run (REV) 03: positive rotation point (FJOG) 04: reverse point motion (RJOG) 05: running pause 06: Operation prohibition 07: external shutdown 08: a free stop 09: emergency shutdown 10: fault input 11: fault reset 12: three line operation 13: Prohibition of acceleration and deceleration 14: add deceleration time to choose 1 15: add deceleration time to choose 2 16: running DC brake 17: stop DC brake 18: stop DC brake + shutdown command 19: multistage frequency terminal 1 20: multistage frequency terminal 2 21: multistage frequency terminal 3 22: multistage frequency terminal 4 23: command switch to panel control 24: command switch to terminal control 25: command switch to communication control 26: frequency given switching (F00.06[bit) 27: master frequency source switch to frequency digital setting 28: the switching of the auxiliary frequency source to the frequency digital setting 29: terminal adjustment and UP 30: terminal regulation reduction DN	01	×
F30.02	X2 Terminal function selection		02	×
F30.03	X3 Terminal function selection		03	×
F30.04	X4 Terminal function selection		11	×
F30.05	X5 Terminal function selection		08	×
F30.06	X6 Terminal function selection		00	×
F30.09	AI1 Terminal function selection		00	×
F30.10	AI2 Terminal function selection		00	×
F30.11	AI3 Terminal function selection		00	×

Function code	Name	Setting range	Factory preset	Modify attribute
		31:UP/DN set zero (terminal, keyboard) 32: pulse input (X4/DI support high speed) 33: count input 34: count zero 35: length count 36: length zero 37: swing frequency startup 38: reset frequency reset 39: simple PLC memory clearance 40: simple PLC run pause 41: the running failure of simple PLC 42: the direction of process PID 43: process PID parameter switching 44: process PID run pause 45: process PID integral pause 46: speed / torque switching 47: the prohibition of torque control		
F30.12	FWD/REV terminal control mode selection	0: two line operation mode 1 1: two line operation mode 2 2: three line operation mode 1 3: three line operation mode 2	0	×
F30.13	Input terminal valid state setting	0: positive logic 1: anti logic Single bit: BIT0 ~ BIT3:X1X4 10 bits: BIT0 ~ BIT3:X5X8 100 bits: BIT0 ~ BIT2:AI1AI3	000	○
F30.14	Input terminal filter time	0.000s－2.000s	0.010s	○
F30.15	X1 terminal conduction delay	0.0s－3600.0s	0.0s	○
F30.16	X1 terminal disconnection delay	0.0s－3600.0s	0.0s	○
F30.17	X2 terminal conduction delay	0.0s－3600.0s	0.0s	○
F30.18	X2 terminal disconnection delay	0.0s－3600.0s	0.0s	○
F31 Switch value output				
F31.00	Y1 Terminal function selection	00: no output 01: actuators are under pressure 02: the drive is ready to complete 03: drive running 04: drive forward running 05: drive reverse run 06: drive DC brake 07: drive zero frequency operation (shutdown is effective)	00	○
F31.01	Y2Terminal function selection		00	○
F31.02	RL1 relay function selection		21	○

Function code	Name	Setting range	Factory preset	Modify attribute
		08: VFD's zero frequency operation (invalid shutdown) 09: torque restriction action (speed control) 10: speed limit action (torque control) 11: frequency level detection signal FDT1 12: frequency level detection signal FDT2 13: frequency to FAR 14: upper limit of frequency 15: lower limit of frequency 16: zero current detection 17: X1 terminal state 18: X2 terminal state 19: motor overload alarm 20: motor overheating alarm 21: drive fault output 22: drive alarm output 23: VFD overload alarm 24: VFD overheating alarm 25: simple PLC cycle completion 26: the completion of the simple PLC phase 27: limit of frequency limit of swing frequency 28: continuous running time arrives 29: cumulative running time 30: set value to arrive 31: the designation value arrives 32: set the length to reach 33: brake control output 34: location completion 35: position location connection		
F31.04	Y1 pre output delay	0.0s－3600.0s	0.0s	○
F31.05	Y1 after output delay	0.0s－3600.0s	0.0s	○
F31.06	Y2 pre output delay	0.0s－3600.0s	0.0s	○
F31.07	Y2 after output delay	0.0s－3600.0s	0.0s	○
F31.08	RL1 pre output delay	0.0s－3600.0s	0.0s	○
F31.09	RL1 after output delay	0.0s－3600.0s	0.0s	○
F31.12	Output terminal valid state setting	0: positive logic 1: anti logic BIT0: Y1/DO BIT1:Y2 BIT2:RL1	0	○
F31.13	FDT1 detection mode	0: detectable at a given frequency 1: detectable by output frequency	0	○
F31.14	DT1 level upper limit	FDT1 level lower limit – max. frequency	2.50Hz	○

Function code	Name	Setting range	Factory preset	Modify attribute
F31.15	FDT1 level lower limit	0.00Hz－FDT1 level upper limit	2.00Hz	○
F31.16	FDT2 detection mode	0: detectable at a given frequency 1: detectable by output frequency	0	○
F31.17	FDT2 level upper limit	Level lower limit – max. frequency	2.50Hz	○
F31.18	FDT2 level lower limit	0.00Hz－FDT2 Level Upper limit	2.00Hz	○
F31.19	Frequency arrival (FAR) detection width	0.00Hz－max. frequency	2.50Hz	○
F31.20	Zero frequency signal detection value	0.00Hz－max. frequency	0.50Hz	○
F31.21	Zero frequency offset range	0.00Hz－max. frequency	0.00Hz	○
F31.22	Zero current detection level	0.0%－50.0%	5.0%	○
F31.23	Zero current detection time	0.00s－50.00s	0.50s	○
F31.24	Brake control selection	0: prohibition 1: action	0	×
F31.25	Brake release frequency	0.00Hz－10.00Hz	2.50Hz	×
F31.26	Brake release current	0.0%－200.0%	120.0%	×
F31.27	Brake release time	0.0s－10.0s	1.0s	×
F31.28	Brake pull-in frequency	0.00Hz－10.00Hz	2.00Hz	×
F31.29	Brake pull waiting time	0.0s－10.0s	0.0s	×
F31.30	Brake pull action time	0.0s－10.0s	1.0s	×
F32 Analog and pulse input				
F32.00	external quantitative curve selection	Single bit: AI1 characteristic curve selection 10 bits: AI2 characteristic curve selection 100 bits: AI3 characteristic curve selection 1000 bit: AIP characteristic curve selection 0: no correction 1: curve 1 (2 point) 2: curve 2 (4 point) 3: curve 3 (4 point)	0000	×
F32.01	Maximum input of curve 1	Minimum input (F32.03)－10.00V	10.00V	○
F32.02	Maximum input corresponding value of curve 1	-100.0%－100.0%	100.0%	○
F32.03	Minimum input of curve 1	-10.00V－Maximum input (F32.01)	0.00V	○
F32.04	Minimum input corresponding	-100.0%－100.0%	0.0%	○

Function code	Name	Setting range	Factory preset	Modify attribute
	value of curve 1			
F32.05	Maximum input of curve 2	Inflexion B input (F32.07)－10.00V	10.00V	○
F32.06	Maximum input corresponding value of curve 2	-100.0%－100.0%	100.0%	○
F32.07	Curve 2 fold line inflection point B input	Inflexion A input (F32.09)－Maximum input (F32.05)	0.00V	○
F32.08	Curve 2 inflection point B corresponding value	-100.0%－100.0%	0.0%	○
F32.09	Curve 2 inflexion A input	Minimum input (F32.11)－Inflexion B input (F32.07)	0.00V	○
F32.10	Curve 2 inflection point A corresponding value	-100.0%－100.0%	0.0%	○
F32.11	Minimum input of curve 2	-10.00V－Inflexion A input (F32.09)	0.00V	○
F32.12	Minimum input corresponding value of curve 2	-100.0%－100.0%	0.0%	○
F32.13	Maximum input of curve 3	Inflexion B input (F32.15)－10.00V	10.00V	○
F32.14	Maximum input corresponding value of curve 3	-100.0%－100.0%	100.0%	○
F32.15	Curve 3 fold line inflection point B input	Inflexion A input (F32.17)－Maximum input (F32.13)	0.00V	○
F32.16	Curve 3 inflection point B corresponding value	-100.0%－100.0%	0.0%	○
F32.17	Curve 3 inflexion A input	Minimum input (F32.19)－Inflexion B input (F32.15)	0.00V	○
F32.18	Curve 3 inflection point A corresponding value	-100.0%－100.0%	0.0%	○
F32.19	Minimum input of curve 3	-10.00V－Inflexion A input (F32.17)	0.00V	○
F32.20	Minimum input corresponding value of curve 3	-100.0%－100.0%	0.0%	○
F32.21	Analog input AI1 filtering time	0.000s－10.000s	0.050s	○
F32.22	Analog input AI1 bias	-100.0%－100.0%	0.0%	○
F32.23	Analog input AI1 gain	-2.000－2.000	1.000	○
F32.24	Analog input AI2 filtering time	0.000s－10.000s	0.050s	○
F32.25	Analog input AI2	-100.0%－100.0%	0.0%	○

Function code	Name	Setting range	Factory preset	Modify attribute
	bias			
F32.26	Analog input AI2 gain	-2.000－2.000	1.000	○
F32.27	Analog input AI3 filtering time	0.000s－10.000s	0.050s	○
F32.28	Analog input AI3 bias	-100.0%－100.0%	0.0%	○
F32.29	Analog input AI3 gain	-2.000－2.000	1.000	○
F32.30	Analog input AIP filtering time	0.000s－10.000s	0.050s	○
F32.31	Analog input AIP bias	-100.0%－100.0%	0.0%	○
F32.32	Analog input AIP gain	-2.000－2.000	1.000	○
F32.33	DI maximum input frequency	DI Min. input frequency－100.00kHz	10.0kHz	○
F32.34	DI maximum corresponding value	-100.0%－100.0% 100.0%	100.0%	○
F32.35	DI minimum input frequency	0.00kHz－DI Maximum input frequency	0.0kHz	○
F32.36	DI minimum corresponding value	-100.0%－100.0% 0.0%	0.0%	○
F32.37	DI input filtering time	0.000s－1.000s	0.001s	○
F33 Analog and pulse output				
F33.00	AO1 terminal output function selection	00: no output 01: a given frequency 02: output frequency 03: output current (relative drive) 04: output torque (absolute value) 05: output power 06: output voltage 07: bus voltage 08: AI1 input 09: AI2 input 10: AI3 input 11: pulse input (0-50kHz) 12: output current (relative motor) 13: output torque 14: torque instruction	02	○
F33.01	AO2 terminal output function selection		01	○
F33.02	DO terminal output function selection		00	○
F33.03	AO1 bias	-100.0%－100.0%	0.0%	○
F33.04	AO1 gain	-2.000－2.000	1.000	○
F33.05	AO1 filtering time	0.000s－10.000s	0.0s	○
F33.06	AO2 bias	-100.0%－100.0%	0.0%	○
F33.07	AO2 gain	-2.000－2.000	1.000	○
F33.08	AO2 filtering time	0.000s－10.000s	0.0s	○

Function code	Name	Setting range	Factory preset	Modify attribute
F33.09	DO maximum output pulse frequency	0.01kHz－50.00kHz	10.00kHz	○
F33.10	DO output center point selection	0: no center point 1: there is a central point, the center point is (F33.09) /2, and the corresponding function is positive when frequency is greater than center point.	0	×
F33.11	DO output filtering time	0.000s－10.000s	0.0s	○
F34 Analog input and output correction				
F34.00	Simulation quantity correction selection	Single bit: AI1 correction limiting method 10 bits: AI2 correction limiting method 100 bits: AI3 correction limiting method 1000 digit: AIP correction limiting method 0: output unlimited amplitude 1: the amplitude of the output limit 2: lower than the lower output zero, Upper limit of upper limit output	0000	×
F34.01	Analog quantity mapping selection	Single bit: AI1 mapping channel selection 10 bits: AI2 mapping channel selection 100 bits: AI3 mapping channel selection 1000 bit: AIP mapping channel selection 0: analog input AIP 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: analog input AI4 5: analog input AI5 6: analog input AI6 7: analog input AI7	0321	
F34.02	AI1 sampling value 1	0.00V－10.00V	1.00V	○
F34.03	AI1 measurement value 1	0.00V－10.00V	1.00V	○
F34.04	AI1 sampling value 2	0.00V－10.00V	9.00V	○
F34.05	AI1 measurement value 2	0.00V－10.00V	9.00V	○

Function code	Name	Setting range	Factory preset	Modify attribute
F34.06	AI2 sampling value 1	0.00V－10.00V	1.00V	○
F34.07	AI2 measurement value 1	0.00V－10.00V	1.00V	○
F34.08	AI2 sampling value 2	0.00V－10.00V	9.00V	○
F34.09	AI2 measurement value 2	0.00V－10.00V	9.00V	○
F34.10	AI3 sampling value 1	-10.00V－10.00V	1.00V	○
F34.11	AI3 measurement value 1	-10.00V－10.00V	1.00V	○
F34.12	AI3 sampling value 2	-10.00V－10.00V	9.00V	○
F34.13	AI3 measurement value 2	-10.00V－10.00V	9.00V	○
F34.14	AIP sampling value 1	0.00V－10.00V	1.00V	○
F34.15	AIP measurement value 1	0.00V－10.00V	1.00V	○
F34.16	AIP sampling value 2	0.00V－10.00V	9.00V	○
F34.17	AIP measurement value 2	0.00V－10.00V	9.00V	○
F34.18	AO1 output value 1	0.00V－10.00V	1.00V	○
F34.19	AO1 measurement value 1	0.00V－10.00V	1.00V	○
F34.20	AO1 output value 2	0.00V－10.00V	9.00V	○
F34.21	AO1 measurement value 2	0.00V－10.00V	9.00V	○
F34.22	AO2 output value 1	0.00V－10.00V	1.00V	○
F34.23	AO2 measurement value 1	0.00V－10.00V	1.00V	○
F34.24	AO2 output value 2	0.00V－10.00V	9.00V	○
F34.25	AO2 measurement value 2	0.00V－10.00V	9.00V	○
F40 Display settings				
F40.00	Run display parameter 1	00: ineffective display	07	○

Function code	Name	Setting range	Factory preset	Modify attribute
	settings	01: input terminal 02: output terminal 03: machine state 04: running speed 05: rotor frequency 06: setting frequency 07: operating frequency (after acceleration and deceleration) 08: synchronization frequency 09: local frequency 10: expansion frequency 11: bus voltage 12: output voltage 13: output current 14: output power 15: output torque 16: torque given 17: AI1 voltage 18: AI2 voltage 19: AI3 voltage 20: AIP voltage 21 :AO1 voltage 22: AO2 voltage 23: PID given 24: PID feedback 25: PID error 26: PLC stage 27: master channel 28: auxiliary setup channel 29: main setting frequency 30: auxiliary setting frequency 31: external count 32: set the length value 33: running length value 34: running line speed 35:DI input frequency 36:DO output frequency 37: the temperature of the radiator 38: the temperature of the motor		
F40.01	Run display parameter 2 settings		13	○
F40.02	Run display parameter 3 settings		11	○
F40.03	Run display parameter 4 settings		00	○
F40.04	Run display parameter 5 settings		00	○
F40.05	Run display parameter 6 settings		00	○
F40.06	Downtime display parameter 1 settings		06	○
F40.07	Downtime display parameter 2 settings		11	○
F40.08	Downtime display parameter 3 settings		00	○
F40.09	Downtime display parameter 4 settings		00	○
F40.10	Downtime display parameter 5 settings		00	○
F40.11	Downtime display parameter 6 settings		00	○
F40.12	Linear velocity display coefficient	0.0%－1000.0%	0.0%	○
F41 Operation panel parameters				
F41.00	User password setting	00000－65535	00000	○
F41.01	Function code protection item	0: all function codes allow modification 1: only F41.00 and F41.01 allow modification	0	×
F41.02	Function code initialization	0: no operation 1: recovery of factory parameters (no motor parameters) 2: recovery of factory parameters (including motor parameters) 3: clear fault record information	0	×
F41.03	Parameter copy	0: no operation	0	×

Function code	Name	Setting range	Factory preset	Modify attribute
		0: parameter upload 1: parameter downloading (no motor parameters) 2: parameter downloading (including motor parameters)		
F41.04	M key function selection	0: no function 1: Run command switch for given way 2: positive reversal switching 3: point movement positive rotation 4: point motion reversal	3	×
F41.05	Key locking function	0: not locking 1: full lock 2: locking out of multi function key 3: locking except RUN and STOP keys	0	×
F41.06	STOP Key function	0: STOP key is valid only keyboard operation mode 1: STOP keys are valid under any operating mode	0	○
F41.07	▲/▼key and UP/DN Terminal frequency regulation control	Single bit: action selection at downtime 0: shut down 1: downtime 10 bits: action selection when power off 0: power off 1: power off maintenance 100 bits: adding and subtracting rate mode selection 0: automatic 1: Manual	011	○
F41.08	Manual UP/DN deceleration rate	0.00Hz/s－10.00Hz/s	1.00Hz/s	○
F42 Shortcut menu user custom display function code				
F42.00	Frequency master given number setting	1000 bit settings range: 0-9 100 bits range: 0-9 10 bit setting range: 0-9 Single bit settings: 0-9	F00.00	×
F42.01	Frequency master given		F00.01	×
F42.02	Maximum frequency		F00.07	×
F42.03	Upper frequency		F00.08	×
F42.04	Lower frequency		F00.09	×
F42.05	Run command given		F01.00	×
F42.06	Running direction selection		F01.02	×
F42.07	Acceleration time 1		F02.00	×

Function code	Name	Setting range	Factory preset	Modify attribute
F42.08	Deceleration time 1		F02.01	×
F42.09	Motor type		F10.00	×
F42.10	Motor control mode		F10.01	×
F42.11	Motor rated power		F10.02	×
F42.12	Motor rated voltage		F10.03	×
F42.13	Motor rated current		F10.04	×
F42.14	Motor rated frequency		F10.05	×
F42.15	Motor rated speed		F10.06	×
F42.16	Motor pole number		F10.07	×
F42.17	Motor parameter tuning		F10.08	×
F42.18	Function code initialization		F41.02	×
F42.19	M key function selection		F41.04	×
F50 Process PID control				
F50.00	PID given mode selection	0: given by F50.01 1: analog input AI1 2: analog input AI2 3: analog input AI3 4: pulse given (DI) 5: communication input	0	×
F50.01	PID digital given	0.0%－100.0%	50.0%	○
F50.02	PID feedback mode selection	0: analog input AI1 1: analog input AI2 2: analog input AI3 3:AI1+AI2 4:AI1-AI2 5:MIN{AI1, AI2} 6:MAX{AI1, AI2} 7: pulse given (DI) 8: communication input	0	×
F50.03	PIDAdjustment selection	Single bit: output frequency 0: must be in accordance with the setting of the running direction 1: it can be opposite to setting the running direction 10 bits: integral method 0: the integral reaches the upper and lower limits, and continues to adjust the integral 1: the integral reaches the upper and lower limits, and stops the integral adjustment	11	×

Function code	Name	Setting range	Factory preset	Modify attribute
F50.04	PID Positive and negative effects	0: positive effect 1: negative effect	0	×
F50.05	PID Given filter time	0.00s－10.00s	0.00s	○
F50.06	PID Feedback filtering time	0.00s－10.00s	0.00s	○
F50.07	PID output filtering time	0.00s－10.00s	0.00s	○
F50.08	Proportional gain Kp1	0.0－100.0	50.0	○
F50.09	Integral time Ti1	0.000s－50.000s	0.500s	○
F50.10	Differential time Td1	0.000s－50.000s	0.000s	○
F50.11	Proportional gain Kp2	0.0－100.0	50.0	○
F50.12	Integral time Ti2	0.000s－50.000s	0.500s	○
F50.13	Differential time Td2	0.000s－50.000s	0.000s	○
F50.14	PID parameter switching selection	0: only using Kp1, Ki1, and Kd1 1: automatic switching based on input deviation 2: terminal switch	0	×
F50.15	PID Input deviation in automatic switching	0.0%－100.0%	20.0%	○
F50.16	Sampling period (T)	0.001s－50.000s	0.002s	○
F50.17	Deviation limit	0.0%－100.0%	0.0%	○
F50.18	Differential term limit	0.0%－100.0%	0.5%	○
F50.19	PIDinitial value	0.0%－100.0%	0.0%	○
F50.20	PIDInitial value retention time	0.0s－3600.0s	0.0s	×
F50.21	PID Maximum operation output	0.0%－100.0%	100.0%	○
F50.22	PID Reversal output cut-off frequency	0.00Hz－Maximum frequency	00.00Hz	○
F50.23	PID Downtime operation selection	0: no operation when downtime 1: downtime operation	0	○
F50.24	PID Given loss detection value	0.0%－100.0%	0.0%	○
F50.25	PID Given loss detection time	0.00s－30.00s 0.00s: Do not detect a given loss of PID	1.00s	×
F50.26	PID Feedback loss detection value	0.0%－100.0%	0.0%	×
F50.27	PID Feedback	0.00s－30.00s	1.00s	×

Function code	Name	Setting range	Factory preset	Modify attribute
	loss detection time	0.00s: Non detection of PID feedback loss		
F50.28	PID signal loss stopping mode	0: free stop 1: emergency shutdown	0	○
F50.29	Zero frequency upper bound value	F50.30－Upper frequency	0.00Hz	×
F50.30	Zero frequency running lower bound value	0.00Hz－F50.29	0.00Hz	×
F51 Multistage frequency				
F51.00	Multi segment frequency number given 0	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.01	Multi segment frequency number given 1	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.02	Multi segment frequency number given 2	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.03	Multi segment frequency number given 3	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.04	Multi segment frequency number given 4	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.05	Multi segment frequency number given 5	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.06	Multi segment frequency number given 6	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.07	Multi segment frequency number given 7	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.08	Multi segment frequency number given 8	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.09	Multi segment frequency number given 9	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.10	Multi segment frequency number given 10	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.11	Multi segment frequency number given 11	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.12	Multi segment frequency number given 12	Lower limit frequency - upper limit frequency	0.00Hz	○

Function code	Name	Setting range	Factory preset	Modify attribute
F51.13	Multi segment frequency number given 13	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.14	Multi segment frequency number given 14	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.15	Multi segment frequency number given 15	Lower limit frequency - upper limit frequency	0.00Hz	○
F51.16	Multi segment frequency 0 setting mode	0: a number given F51.00 1: digital given (F00.00) +UP/DN regulation 2: analog input AI1 3: analog input AI2 4: analog input AI3 5: pulse given (DI) 6: process PID 7: Communication given	0	×
F51.17	Multi segment frequency 1 setting mode	0: a number given F51.01 1: digital given (F00.00) +UP/DN regulation 2: analog input AI1 3: analog input AI2 4: analog input AI3 5: pulse given (DI) 6: process PID 7: Communication given	0	×
F52 Simple PLC				
F52.00	Simple PLC operation mode selection	Single bit: simple PLC operation 0: a single cycle stop 1: keep the final value after a single cycle 2: continuous cycle 10 bits: simple PLC starting mode 0: start from stage 0 1: continue to run from the stage frequency of the interruption 100 bits: simple PLC power down memory 0: power reduction 1: power down storage 1000 bits: simple PLC time units 0: second (s) 1: minutes (min)	0000	×
F52.01	PLC phase 0 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 0 (F51.00) 1: analog input AI1 2: analog input AI2 3: analog input AI3	000	×

Function code	Name	Setting range	Factory preset	Modify attribute
		4: pulse given (DI) 5: Communication given 6: process PID 7: multistage frequency 10 bits: simple PLC stage running direction 0: positive 1: reverse 2: determined by the run command 100 bits: simple PLC stage plus deceleration time 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4		
F52.02	Stage 0 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.03	PLC phase 1 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 1 (F51.01) Other reference phase 0 settings	000	×
F52.04	Stage 1 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.05	PLC phase 2 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 2 (F51.02) Other reference phase 0 settings	000	×
F52.06	Stage 2 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.07	PLC phase 3 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 3 (F51.03) Other reference phase 0 settings	000	×
F52.08	Stage 3 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.09	PLC phase 4 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 4 (F51.04) Other reference phase 0 settings	000	×
F52.10	Stage 4 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.11	PLC phase 5 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 5 (F51.05) Other reference phase 0 settings	000	×
F52.12	Stage 5 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.13	PLC phase 6	Single bit: simple PLC phase running	000	×

Function code	Name	Setting range	Factory preset	Modify attribute
	setting	frequency 0: multi segment frequency 6 (F51.06) Other reference phase 0 settings		
F52.14	Stage 6 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.15	PLC phase 7 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 7 (F51.07) Other reference phase 0 settings	000	×
F52.16	Stage 7 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.17	PLC phase 8 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 8 (F51.08) Other reference phase 0 settings	000	×
F52.18	Stage 8 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.19	PLC phase 9 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 9 (F51.09) Other reference phase 0 settings	000	×
F52.20	Stage 9 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.21	PLC phase 10 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 10 (F51.10) Other reference phase 0 settings	000	×
F52.22	Stage 10 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.23	PLC phase 11 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 11 (F51.11) Other reference phase 0 settings	000	×
F52.24	Stage 11 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.25	PLC phase 12 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 12 (F51.12) Other reference phase 0 settings	000	×
F52.26	Stage 12 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.27	PLC phase 13 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 13 (F51.13) Other reference phase 0 settings	000	×
F52.28	Stage 13 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.29	PLC phase 14 setting	Single bit: simple PLC phase running frequency	000	×

Function code	Name	Setting range	Factory preset	Modify attribute
		0: multi segment frequency 14 (F51.14) Other reference phase 0 settings		
F52.30	Stage 14 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F52.31	PLC phase 15 setting	Single bit: simple PLC phase running frequency 0: multi segment frequency 15 (F51.15) Other reference phase 0 settings	000	×
F52.32	Stage 15 running time	0.0s(min)－3276.7s(min)	0.0s(min)	○
F53 Pendulum frequency and fixed length				
F53.00	Selection of swing frequency function	0: No use pendulum frequency function 1: Use swing frequency function	0	×
F53.01	Swing frequency operation mode	Single bit: starting mode 0: automatic mode 1: terminal manual 10 bits: swing control 0: relative to the pendulum frequency center frequency 1: relative to the maximum output frequency 100 bits: selection of starting mode of swing frequency stop 0: start starting again 1: start by the state of memory before the shutdown 1000 bits: pendulum frequency state power down storage 0: power off scavenging state frequency state 1: power down storage and pendulum state	0000	×
F53.02	Swing frequency preset frequency	0.00Hz－Maximum frequency	0.00Hz	×
F53.03	Frequency preset frequency waiting time	0.0s－999.9s	0.0s	×
F53.04	Swing frequency amplitude	0.0%－100.0%	0.0%	×
F53.05	Jump frequency	0.0%－50.0%	0.0%	×
F53.06	Frequency cycle	0.1s－6000.0s	10.0s	×
F53.07	Triangular wave rising time	0.1%－100.0% (means pendulum frequency)	5.0%	×
F53.08	Set count value	1－65535	1000	×
F53.09	Specified count value	1－F53.08(set count value)	1000	×
F53.10	Length options	Number of bits: length of arrival 0: continue to run	0000	×

Function code	Name	Setting range	Factory preset	Modify attribute
		1: downtime 10 bits: a unit of length 0: Meter 1:10 M 100 bits: length stop clearing 0: null and void 1: action 1000 bits: counting down and clearing zero 0: null and void 1: action		
F53.11	Set length	0m－65535m	0m	×
F53.12	Pulse number per meter	0.1－6553.5	1000.0	×
U00 State monitoring parameters				
U00.00	Input terminal	Bit0 - Bit7 corresponding X1 - X8 Bit8 - Bit10 corresponding AI1 - AI3 0: the input terminal and the public end disconnect 1: the input terminal is connected to the public end	Actual value	*
U00.01	Output terminal	Bit0 - Bit1 corresponds to Y1 - Y2 Bit2 - Bit3 corresponds to RL1 - RL2 0: the output terminal and the public end disconnect 1: the output terminal is connected to public end	Actual value	*
U00.02	Machine state	Single bit: Bit0: run / stop Bit1: forward / reverse Bit2: DC brake Bit3: parameter identification 10 bits: 0: constant speed 1: acceleration 2: deceleration	Actual value	*
U00.03	Output speed	0rpm－60000rpm	Actual value	*
U00.04	output frequency	0.01Hz－300.00Hz	Actual value	*
U00.05	Set frequency	0.01Hz－300.00Hz	Actual value	*
U00.06	Operating frequency	0.01Hz－300.00Hz	Actual value	*
U00.07	Synchro frequency	0.01Hz－300.00Hz	Actual value	*
U00.08	Local frequency	0.01Hz－300.00Hz	Actual value	*
U00.09	Expansion frequency	0.01Hz－300.00Hz	Actual value	*
U00.10	Busbar voltage	0V－60000V	Actual value	*
U00.11	Output voltage	0V－60000V	Actual value	*
U00.12	Output current	0.0A－6000.0A	Actual value	*
U00.13	Output power	0.0kW - 6000.0kW	Actual value	*
U00.14	Output torque	-300.0%－300.0%	Actual value	*

Function code	Name	Setting range	Factory preset	Modify attribute
U00.15	Given torque	-300.0%－300.0%	Actual value	*
U00.16	AI1 voltage	-10.00V－10.00V	Actual value	*
U00.17	AI2 voltage	-10.00V－10.00V	Actual value	*
U00.18	AI3 voltage	-10.00V－10.00V	Actual value	*
U00.19	AIP voltage	-10.00V－10.00V	Actual value	*
U00.20	AO1 voltage	0.00V－10.00V	Actual value	*
U00.21	AO2 voltage	0.00V－10.00V	Actual value	*
U00.22	PID given	-100.00%－100.00%	Actual value	*
U00.23	PID feedback	-100.00%－100.00%	Actual value	*
U00.24	PID erroe	-100.00%－100.00%	Actual value	*
U00.25	PLC phase	0－15	Actual value	*
U00.26	Master set channel	0－11	Actual value	*
U00.27	Auxiliary set channel	0－9	Actual value	*
U00.28	Master set frequency	0.01Hz－300.00Hz	Actual value	*
U00.29	Auxiliary set frequency	0.01Hz－300.00Hz	Actual value	*
U00.30	External count	0 －65535	Actual value	*
U00.31	Set length value	0m－65535m	Actual value	*
U00.32	Run length value	0m－65535m	Actual value	*
U00.33	Run line speed	0m－65535m	Actual value	*
U00.34	DI input frequency	0Hz-60000Hz	Actual value	*
U00.35	DO output frequency	0Hz-60000Hz	Actual value	*
U00.36	Radiator temperature	0.0℃－999.9℃	Actual value	*
U00.37	Motor temperature	0.0℃－999.9℃	Actual value	*
U00.38	AI1 sampling value	-10.00V－10.00V	Actual value	*
U00.39	AI2 sampling value	-10.00V－10.00V	Actual value	*
U00.40	AI3 sampling value	-10.00V－10.00V	Actual value	*
U00.41	AIP sampling value	-10.00V－10.00V	Actual value	*
U00.42	Current fault code	0 － 100	Actual value	*
U00.43	Electricity Accumulative time	0.0h－65535h	Actual value	*
U00.44	Running time accumulative	0.0h－65535h	Actual value	*
U00.45	Motor accumulative energy consumption	0kw.h－59999kw.h	Actual value	*

Function code	Name	Setting range	Factory preset	Modify attribute
U00.46	Motor low accumulative energy consumption	0.0kw.h－999.9kw.h	Actual value	*
U00.47	High energy consumption in this operation	0kw.h－59999kw.h	Actual value	*
U00.48	Low energy consumption in this operation	0.0kw.h－999.9kw.h	Actual value	*
U01 Fault record				
U01.00	Last fault code	1: accelerated overcurrent 2: overcurrent in deceleration 3: over current in constant speed 4: accelerated overvoltage 5: overvoltage in deceleration 6: overvoltage at constant speed 7: external trigger fault 8: fault of current detection 9: sensitive signal failure 10: module detection failure 11: the drive is overheated 12: motor overheating 13: drive overload 14: motor overload 15: the actuators are under pressure 16: drive input phase deficiency 17: the output of the VFD is out of phase 18: drive output load 19: VFD tuning timeout 20: drive to ground short circuit 21: the failure of the contactor 22: EEPROM reading and writing failure 23: Communication timeout fault 24: power up time 25: running time arrives 26: PID given loss 27: PID feedback loss 28: the speed deviation is too large 29: motor supervelocity 30: encoder failure 31-37: Reservations 38: speed tracking failure 39: parameter copy failure	Actual value	*
U01.01	Last fault given frequency	0.00Hz－300.00Hz	Actual value	*
U01.02	Output frequency of last fault	0.00Hz－300.00Hz	Actual value	*
U01.03	Output current of last fault	0.0A －6000.0A	Actual value	*
U01.04	DC bus voltage of last fault	0V－9999V	Actual value	*
U01.05	Output voltage of last fault	0V－9999V	Actual value	*

Function code	Name	Setting range	Factory preset	Modify attribute
U01.06	Input terminal state of last fault	00－7F	Actual value	*
U01.07	Output terminal state of last fault	00－3F	Actual value	*
U01.08	Machine running state during of last fault	00－2F	Actual value	*
U01.09	radiator temperature of last fault	0.0℃－999.9℃	Actual value	*
U01.10	Cumulative running time of last fault	0.0h－6553.5h	Actual value	*
U01.11	Previous fault code	Same as U01.00	Actual value	*
U01.12	Cumulative running time of previous failure	0.0h－6553.5h	Actual value	*
U01.13	First two fault codes	Same as U01.00	Actual value	*
U01.14	Cumulative running time of the first two failures	0.0h－6553.5h	Actual value	*
U01.15	First three fault codes	Same as U01.00	Actual value	*
U01.16	Cumulative running time of the first three failures	0.0h－6553.5h	Actual value	*
U02 Machine and software information				
U02.00	Drive rated power	0.0kW－6000.0kw.h	Model determination	*
U02.01	Drive rated voltage	0V－2000V	Model determination	*
U02.02	Drive rated current	0.0A －6000.0A	Model determination	*
U02.03	Drive software series	TIxxx－TIxxx	Actual value	*
U02.04	Drive function version	1.00－99.99	Actual value	*
U02.05	Drive performance version	1.00－99.99	Actual value	*
U02.06	Drive production time:year	2000－2999	Actual value	*
U02.07	Drive production month and date	01/01－12/31	Actual value	*
U02.08	Custom-made serial number	00－9999	Actual value	*
U02.09	Custom-made non - label	00－9999	Actual value	*
U02.10	Keyboard software version	0.00－99.99	Actual value	*

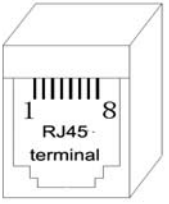
Appendix A Communication protocol

1. Peripheral support

TI260 series VFDs provide dual RS485 communication interface, adopt standard MODBUS communication protocol. Users can operate it through the upper machine (including computer, PLC and other communications equipment) in the following operations: read/write drive function parameters, reading status parameters, writing control commands and so on, among them, communication VFDs is in slave machine model.

2. II. Interface mode

2.1 Interface modes and pin definition



Item	1	2	3	4	5	6	7	8
Definition	485+	485-	485+	GND	GND	485-	+5V	+5V

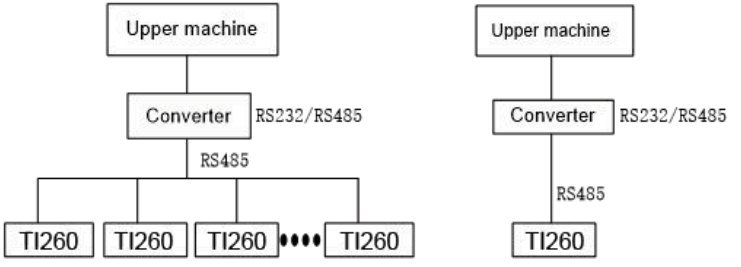
RJ45 terminals and pin signal definition

2.2 Transmission mode

RS485 interface: asynchronous, half duplex

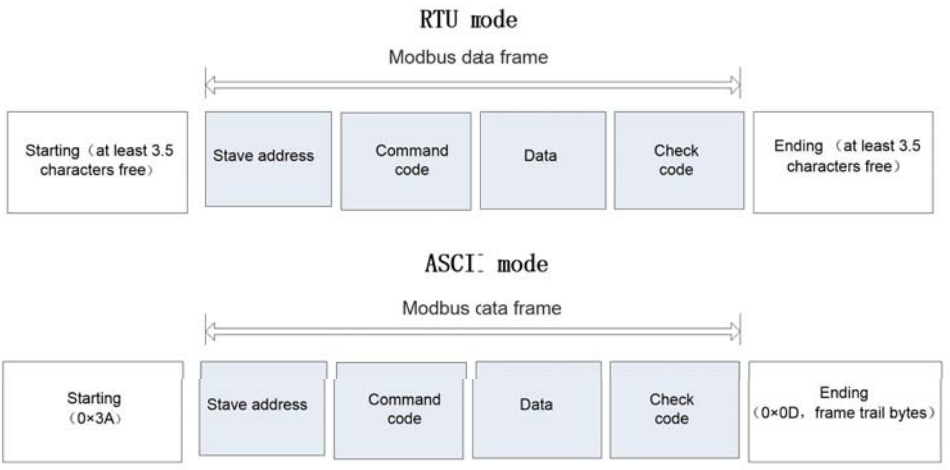
Factory default format and baud rate: 1-8-1-N,9600bps.

3. Networking mode



4. Protocol format

MODBUS protocol supports both RTU mode and ASCII mode, corresponding frame format is as below:



MODBUS adopts "Big Endian" coding method, sending high byte first and then send low byte

1. RTU mode

In the RTU mode, frame header and tail frame define the frame through bus free time not less than 3.5 bytes time. Data validation adopts CRC-16, the whole information participate in validating, detailed please refer to the protocol at the back of the CRC check sample

Take RTU data frame as an example, read no.1 machine internal registers F00.00 = 50.00Hz.

Request frame:

Address	Function code	Register address		Register number		Checksum	
0x01	0x03	0x00	0x08	0x00	0x01	0x5	0xC8

ACK frame:

Address	Function code	ACK bytes	Register contents		Checksum	
0x01	0x03	0x02	0x13	0x88	0xB5	0x12

2. ASCII mode

The frame head is "0x3A", and the end of the frame is "0x0D, 0x0A", the end of the frame can also be defaulted by user configuration. In the form of ASCII, except the frame header and frame tail, all the data bytes are sent in ASCII code. First, send high 4 bit byte, and then send 4 bit byte. The data in the ASCII mode is 7 bit length. For "A" - "F", use the ASCII code of its capital letters. At this time, the data uses the LRC check to check the complement from the

slave address to check sum equal to all the characters and (abandoning the bit) of all the checked data.

Take the ASCII data frame, as an example, to write 4000 (0x0FA0) to the internal register F00.08 of the slave 1.

LRC check= (0x01+0x41+0x00+0x08+0x0F+0xA0) Complement=0x07

	Frame head	Address		Function code		Register address				Write content				LRC check		frame tail	
Bytes	:	0	1	4	1	0	0	0	8	0	F	A	0	0	7	CR	LF
ASCII	3A	30	31	34	31	30	30	30	38	30	46	41	30	30	37	0D	0A

5. Transfer values corresponding scaling relation

Except the remarked parameters, other function codes refer to user manual in the description of the "smallest unit of modification" column to determine the scaling relations of the specified function code

6. Protocol function

1. Support functions

MODBUS protocol supports the following functional operation:

Function code	Function code meaning
0x03	Read the drive function or state parameters.
0x06	Rewrite drive single function or control parameters
0x08	Power line diagnosis
0x10	Rewrite the drive multiple function or control parameters.
0x41	Rewrite the drive single function (power lost without saving) or control parameters
0x42	Parameter management

If the operation request fails, the response should be error code. For example, read 13 consecutive function code return frame from F00.00 is:

Address	Error code	Exception code	Checksum	
0x01	0x83	0x03	0x01	0x31

Error code=Function code ＋ 0x80),

Exception code meaning listed below:

Exception code	Exception code meaning
0x1	Illegal function code
0x2	Illegal register address

0x3	Data error, means that the data is more than upper limit or lower limit
0x4	Slave machine operation failure (including data within the range of upper and lower, but the error is caused by invalid data)
0x16	Unsupported operation (mainly aimed at the control parameters and status parameters, such as those that do not support the attributes and factory upper and lower limit, etc.)
0x17	Register number of request frame is error
0x18	Information frame error: including information length error and calibration error
0x20	Parameters cannot be modified
0x21	running parameters cannot be modified
0x22	Parameters are protected by password

2. ACK frame of MODBUS protocol Request (Take RTU as an example)

1)Read the drive function or state parameters.(Function code0x03)

	Protocol data unit	Data length (in bytes)	Values or range
Request frame	Address	1	0－247,0 is broadcast address
	Function code	1	0x03
	Starting register address	2	0x0000－0xFFFF
	Register number	2	0x0001－0x000C
	CRC check/ LRC check	2/1	
ACK frame	Address	1	1－247
	Function code	1	0x03
	Read number of bytes	1	2*Register number
	Read the content	2*Register number	
	CRC check/ LRC check	2/1	

2)Rewrite drive single function or control parameters(Function code0x06)

3)Rewrite inverter single function parameters (power lost without saving) or control parameters(Function code0x41)

	Protocol data unit	Data length (in bytes)	Values or range
Request frame	Address	1	0－247,0 is broadcast address
	Function code	1	0x06,0x41
	Register address	2	0x0000－0xFFFF
	Register contents	2	0x0000－0xFFFF
	CRC check/LRC check	2/1	
ACK frame	Address	1	1－247
	Function code	1	0x06,0x41
	Register address	2	0x0000－0xFFFF
	Register contents	2	0x0000－0xFFFF
	CRC check/LRC check	2/1	

4)Power line diagnosis(Function code0x08)

	Protocol data unit	Data length (in bytes)	Values or range
Request frame	Address	1	0－247,0 is broadcast address
	Function code	1	0x08
	Subfunction code	2	0x0000－0x0030
	Data	2	0x0000－0xFFFF
	CRC check/LRC check	2/1	
ACK frame	Address	1	1－247
	Function code	1	0x08
	Subfunction code	2	0x0000－0x0030
	Data	2	0x0000－0xFFFF
	CRC check/LRC check	2/1	

Subfunction code supported by power line diagnostic listed below:

Subfunction code	Data (request)	Data (ACK)	Subfunction meaning
0x0001	0x0000	0x0000	Reinitialize communications: make non-answer mode invalid
	0xFF00	0xFF00	Reinitialize communications: make non-answer mode invalid
0x0003	New frame tail" and "00" occupy the high and low byte respectively	“New frame tail” and “00” occupy the high and low byte respectively	Set the ASCII mode frame tail, the "new tail" frames will replace the old line feed symbol, the new frame tail is not saved when power supply drops. Note: the new frame tail is not more than 0 x7F and cannot be equal to 0x3A
0x0004	0x0000	No response	Set non-answer mode, slave machine only response to "reinitialize communication request". Mainly used for isolation failure of slave machine.
0x0030	0x0000	0x0000	Slave machine set non-answer invalid and error command.
	0x0001	0x0001	Slave machine set answer invalid and error command.

5）Rewrite the drive multiple function or control parameters.(Function code0x10)

	Protocol data unit	Data length (in bytes)	Values or range
Request frame	Address	1	0－247,0 is broadcast address
	Function code	1	0x10
	Starting register address	2	0x0000－0xFFFF
	Operation register number	2	0x0001－0x0004
	Register content bytes	1	2*Operation register number
	Register contents	2*Operation register number	

	Protocol data unit	Data length (in bytes)	Values or range
	CRC check/LRC check	2/1	
ACK frame	Address	1	1－247
	Function code	1	0x10
	Starting register address	2	0x0000－0xFFFF
	Operation register number	2	0x0001－0x0004
	CRC check/LRC check	2/1	

The request rewrites the content of continuous data unit starting from the start register address. The register address is mapped to the function parameters and control parameters of the drive. When continuously storing multiple register parameters, the VFD starts to store from the lowest address register until it reaches the register of the highest address. If the storage operation is not completely successful, it will return from the first failed storage address.

6) Parameter management (function code 0x42)

The drive function parameter management consists of upper and lower, the reading parameter read parameter characteristics, read function parameter menu group index, maximum read function parameter group number and a function parameter number, read state parameter index and display parameters such as the current state of a display. The parameter features include the read-write characteristics of the parameters, the units of the parameters, and the calibration relations.

The request frame and response frame of the parameter management are as follows:

	Protocol data unit	Data length (in bytes)	Values or range
Request frame	Address	1	0－247,0 is broadcast address
	Function code	1	0x42
	Subfunction code	2	0x0000－0x0008
	Data	2	By model
	CRC check/LRC check	2/1	
ACK frame	Address	1	1－247
	Function code	1	0x42
	Subfunction code	2	0x0000－0x0008
	Data	2	0x0000－0xFFFF
	CRC check/LRC check	2/1	

If the operation request fails, response should be error code, the error code please refer to previous description:

Subfunctions supported by parameters management listed as below, parameter management does not support to opterate the control parameters

Subfunction code	Data (request)	Data (ACK)	Subfunction meaning

Subfunction code	Data (request)	Data (ACK)	Subfunction meaning
0x0000	Function parameters group number and intra-class index occupy high byte respectively	The upper limit of function parameters	Read the upper limit of function parameter .(state parameter does not support this operation)
0x0001	Function parameters group number and intra-class index occupy high byte respectively	The lower limit of function parameters	Read the lower limit of function parameter .(state parameter does not support this operation)
0x0002	Parameters group number and intra-class index occupy high byte respectively	Parameter characteristics, details refer to parameter characteristics table.	Read characteristics of function parameters.
0x0003	Parameters group number occupies high byte, low byte set to "00".	Maximum value of the index inside the group	Read maximum value of the index inside the group.(state parameter does not support this operation)
0x0004	Function parameters group number occupies high byte, low byte set to "00".	Next function parameters group number occupies high byte, low byte set to “00”.	Read the next function parameter group number.(state parameter does not support this operation)
0x0005	Function parameters group number occupies high byte, low byte set to “00”.	Last function parameters group number occupies high byte, low byte set to “00”.	Read the last function parameter group number.(state parameter does not support this operation)
0x0006	0x3300	State parameter index displayed currently.	Read the state parameter index displayed currently.
0x0007	0x3300	Next state parameter index	Display next state parameter index
0x0008	Parameters group number and intra-class index occupy high byte respectively	Parameters of the factory Settings	Read function code parameters of factory Settings.(state parameter does not support this operation)

The parameter characteristic is 2 byte length, and the bit is defined as follows:

Characteristic parameters(Bit)	Value	Meaning
Bit3－Bit0	00000B	Unsigned
	00001B	Unit Hz
	00010B	Unit A
	00011B	Unit V
	00100B	Unit rpm
	00101B	Unit %
Bit4	0B	Change the upper limit by decimal

Characteristic parameters(Bit)	Value	Meaning
	1B	Change the upper limit by sixteen - band constraints
Bit6－Bit5	00B	1
	01B	0.1
	10B	0.01
	11B	0.001
Bit9－Bit7	001B	Display length 1
	010B	Display length 2
	011B	Display length 3
	100B	Display length 4
	101B	Display length 5
	Reserve	
Bit11－Bit10	00B	Actual parameters can not be modified
	01B	Can be modified
	10B	Runtime cannot be modified
	11B	Manufacturer set, user can not modify
	Reserve	
Bit15－Bit12	Manufacturer reserve	

7. Address mapping relations

Drive function parameters, control parameters and state parameters are mapped to MODBUS read-write register. Drive function parameters, control parameters and group number of status parameters are mapped to high byte register address, the corresponding relationships shown in the following table:

High byte register address	Group No.	High byte register address	Group No.
0x00	F00	0x20	F32
0x01	F01	0x21	F33
0x02	F02	0x22	F34
0x03	F03	0x28	F40
0x04	F04	0x29	F41
0x05	F05	0x2A	F42
0x0A	F10	0x32	F50
0x0B	F11	0x33	F51
0x0C	F12	0x34	F52
0x14	F20	0x35	F53
0x15	F21	0x80	Control parameter group
0x16	F22	0x81	Control parameter

High byte register address	Group No.	High byte register address	Group No.
			group U00
0x1E	F30	0x82	Control parameter group U01
0x1F	F31	0x83	Control parameter group U02

The internal index of the group is mapped to the low byte of the register address. Refer to the user manual indexing function parameters F00U02.

The VFD control parameters can complete the function of starting, stopping and setting the running frequency of the VFD. By retrieving the VFD's status parameters, we can get the parameters of the VFD's running frequency and output current.

1. Control parameter

Drive control parameter intra-class index is shown in the below table, power-fail can not be saved:

Register address	Parameter name	Register address	Parameter name
0x8000	Control command word	0x8008	Reserve
0x8001	Frequency master given	0x8009	PID given(0-100.0%)
0x8002	Frequency auxiliary given	0x800A	PID feedback(0-100.0%)
0x8003	Electric torque limit(0-200.0%)	0x800B	Reserve
0x8004	Regenerative torque limit(0-200.0%)	0x800C	Reserve
0x8005	Torque given(0-100.0%)	0x800D	Multistage velocity given
0x8006	Timing forward speed limit	0x800E	PLC frequency given
0x8007	The torque timing reverse speed limit		

Drive control command word bits are defined as follows (i.e., control command word register address register at 0x8000):

Control word(Bit)	Value	Meaning	Functional description
Bit0	1	Run command valid	Drive start and stop control (along trigger mode)
	0	Run command invalid	
Bit1	0	Forward	Operation direction, positive turn / reverse of equivalent terminal
	1	Reverse	
Bit2	1	shutdown mode: deceleration and shutdown	Drive deceleration stop control (along trigger mode)
Bit3	1	Shutdown mode: emergency shutdown	Drive emergency shutdown control (along trigger mode)

Control word(Bit)	Value	Meaning	Functional description
Bit4	1	Stop mode: free stop	Drive free stop control (along trigger mode)
Bit5	1	Shutdown mode: external failure shutdown	Drive displays an external fault and stops or continues to run in the way F01.10 is set.
Bit6	1	Point moving positive rotation	Point moving positive rotation control
	0	Point moving forward stop	
Bit7	1	Point moving reversal	Point dynamic inversion control
	0	Point moving reversal stop	
Bit8	1	Fault reset effective	Drive fault reset control
	0	Failure reposition invalid	
Bit12	1	Current control valid	current control word is valid
	0	Current control invalid	current control word is invalid

Drive control command (i.e. control command word bit logic combination):

Register contents	Control command	Register contents	Control command
0x1001	Running forward	0x1020	External fault stop
0x1003	Running reverse	0x1040	Inching forward
0x1004	Slowing down to stop	0x1080	Inching reverse
0x1008	Emergency stop	0x1100	Fault reset
0x1010	Coast to stop		

Virtual terminal control control setting word definition:

Control word(Bit)	Value	Meaning
Bit0	0	DO1 output is invalid
	1	DO1 output is valid
Bit1	0	DO2 output is invalid
	1	DO2 output is valid
Bit2	0	RLY1 output is invalid
	1	RLY1 output is valid

2. State parameters

The index of the drive status parameter group is shown as shown in the following table:

Register address	Parameter name	Register address	Parameter name
0x8100	Input terminal	0x8119	PLC stage
0x8101	Output terminal	0x811A	Master set channel
0x8102	Machine state	0x811B	Auxiliary set channel
0x8103	Output speed	0x811C	Master set frequency

Register address	Parameter name	Register address	Parameter name
0x8104	output frequency	0x811D	Auxiliary setting frequency
0x8105	Set frequency	0x811E	External count
0x8106	Operating frequency	0x811F	Set length value
0x8107	Synchro frequency	0x8120	Run length value
0x8108	Local frequency	0x8121	Run line speed
0x8109	Expansion frequency	0x8122	DI input frequency
0x810A	Busbar voltage	0x8123	DO output frequency
0x810B	output voltage	0x8124	Radiator temperature
0x810C	Output current	0x8125	Motor temperature
0x810D	output power	0x8126	AI1 Sampling value
0x810E	Output torque	0x8127	AI2 Sampling value
0x810F	Given torque	0x8128	AI3 Sampling value
0x8110	AI1 voltage	0x8129	AIP Sampling value
0x8111	AI2 voltage	0x812A	Current fault code
0x8112	AI3 voltage	0x812B	Electricity accumulative time
0x8113	AIP voltage	0x812C	Running time accumulative
0x8114	AO1 voltage	0x812D	Motor accumulative energy consumption
0x8115	AO2 voltage	0x812E	Motor low accumulative energy consumption
0x8116	PID give	0x812F	High energy consumption in this operation
0x8117	PID feedback	0x8130	Low energy consumption in this operation
0x8118	PID error		

8. Special instructions:

1. For a data frame in a ASCII code format, if the frame length is even, the frame is discarded.
2. Function of many multi input terminals will be the same, which will lead to functional disorder. Users should avoid this function when modifying multi-function terminals through MODBUS protocol.
3. Some parameters have negative values, for example, analog input -10V ~ +10V. When input 0.00V, the data read by the communication is 0, when the input is -0.01, the data read is 65535, when the input is -10V, the data read is 64536. When the data is negative, the maximum value is 65535, and the minimum value decreases in turn.

9. CRC check

It takes more time to calculate the CRC check sum of each send byte online, but it can save the program space occupied by the table. The code for online computing CRC is 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));
}
```

10. Application example

Explanation: when using communication control VFD, check whether the hardware is connected well. At the same time, the data format, baud rate and communication address of the VFD are set up.

1. Read the request frame of the maximum output frequency (read F00.07 function parameters) from machine 1

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x03	0x00	0x07	0x00	0x01	0x35	0xCB

Corresponding response (ACK) frame (at this time F00.07=50.00Hz)

Address	Function code	Register address	Number of words read		Checksum	
0x01	0x03	0x02	0x13	0x88	0xB5	0x12

2. Read the DC bus voltage (read state parameter) from the slave 1.

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x03	0x81	0x0A	0x00	0x01	0x1D	0xF7

Corresponding response frame (at this time bus voltage is 522V):

Address	Function code	Register address	Number of words read		Checksum	
0x01	0x03	0x02	0x02	0x0A	0x39	0x23

3. Write down the set frequency from machine 1 (set F00.00 to 30.00Hz, save when power down)

Address	Function code	Register address	Number of words read	Checksum

0x01	0x06	0x00	0x00	0x0B	0xB8	0x8E	0x88

Corresponding response frames:

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x00	0x00	0x0B	0xB8	0x8E	0x88

4．Forward running for slave machine named address 1

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x01	0x6C	0x0A

Corresponding response frames

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x01	0x6C	0x0A

5．Reverse running for slave machine named address 1

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x03	0xED	0xCB

Corresponding response frames

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x03	0xED	0xCB

6．Deceleration stop command for slave machine named address 1

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x04	0xAC	0x09

Corresponding response frames

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x04	0xAC	0x09

7．Free stop command for slave machine named address 1

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x10	0xAC	0x06

Corresponding response frames:

Address	Function code	Register address		Number of words read		Checksum	
0x01	0x06	0x80	0x00	0x10	0x10	0xAC	0x06

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