Preface

Thanks for choosing CT100G&CT100E Series Inverter. Please read this manual carefully before using. If you find any problem or not understand this manual, please contact factory. If there are any problems in using, please also contact engineer of factory.

We will keep to update both hardware and software to get better performance without notice. Please understand.

Content

Safety precautions

Please read this manual carefully and follow all safety precautions before installing, debugging, maintaining and repairing the inverter.

If any physical injury or death or damage to the devices occurs for ignoring to the safety precautions in the manual, our company will not be responsible for any damages and we are not legally bound in any manner.

Following the warning symbols are used in this manual:

Serious physical injury or even death may occur if not follow the relative requirements.

Physical injury or damage to the devices may occur if not follow the relative requirements.

Safety guidelines

Before installation

» Do not operate the inverter if there are any signs of water in the inverter when unpacking.

» Do not operate the inverter if there is any damage or components loss to the inverter when unpacking. Otherwise, physical injury or damage to the devices may occur.

» Do not touch the control terminals, PCB board or components inside the inverter with hands or body.

» Do not operate the inverter if the packing list is not consistent with the devices.

» Do not operate the inverter if the information on the type designation label is not consistent with your order.

Installation

» Only qualified electricians are allowed to perform the installation, otherwise electric shock may occur.

» Please install the inverter on fire-retardant materials and keep the inverter away from combustible materials, otherwise a fire may occur.

» Please assemble and tighten the mounting screws of the inverter according to the regulations, otherwise the inverter may fall off.

» Do not install the inverter in explosive atmospheres, otherwise an explosion may

occur.

» Handle the inverter with care to prevent it falls off and thus causes injury to your feet or device damage.

» Keep the inverter away from the places with large vibrations, water drops and direct sunlight.

» When installing the inverter in the cabinet, especially if two or more inverters are installed in a cabinet, please pay attention to the installation space and ventilation.

» Take measures to avoid screws, cables and other conductive matters fall into the inverter during installation.

Wiring

» Only qualified electricians are allowed to perform the wiring, otherwise electric shock or device damage may occur.

» Carry out wiring strictly in accordance with this manual, otherwise there is a risk of electric shock or device damage.

» Ensure all input power supply is disconnected before wiring, otherwise electric shock may occur.

» Please select all cables, circuit breakers and contactors meeting the national standards as required by the manual.

» The inverter must be grounded reliably, otherwise electric shock may occur.

» Carry out wiring strictly in accordance with the silk printing instructions and avoid connecting the input and output wires reversely, otherwise the damage to the devices may occur.

» Keep the signal cables of the inverter away from the power cables as far as possible, or distribute the two categories of cables vertically-crossed if the distance is not far enough, otherwise it may cause signal interference.

» Ensure that all the screws are tightened when wiring, otherwise damage to the inverter may occur.

» The encoders and sensors should be applied with the shielded cables and the shielded layer should be grounded reliably.

Operation

» Confirm that the wiring is completed and correct and then cover the plate before power on.

» Do not open the plate after power on, otherwise electric shock may occur.

» Operate the inverter appropriately, otherwise damage to the inverter may occur.

» Non-professionals are not allowed to test the signals when the inverter is running. Otherwise, physical injury or damage to the devices may occur.

» Do not change the parameters of the inverter at random, otherwise damage to the inverter may occur.

» Do not touch the fans and brake resistors, otherwise it may cause mechanical injury or burn.

» Do not start up or stop the inverter by power on or off, otherwise damage to the inverter may occur.

» Ensure that the circuit breakers or contactors at the output sides of the inverter are not in output state before switching, otherwise damage to the inverter may occur.

Others

» This inverter is not suitable for the occasions when the specifications exceed those specified in this manual. If you have special requirements, please contact our technical department.

» The inverter is equipped with surge suppressors inside, which can protect it from the lightning. It is necessary to mount external surge suppressors at the power input side of the inverter in high lightning incidence areas.

» When the conductors between the inverter and the motor exceed 100m, it is recommended to mount the output reactors to avoid overcurrent caused by excessive distributed capacitance.

» Do not mount the compensation capacitors and the surge absorbers at the output sides of the inverter. Otherwise, it may cause damage to the inverter due to overheating.

» Mounting the input or output reactors, special filters and magnetic rings at the input or output sides of the inverter can effectively reduce the noise and thus avoid interference to other devices.

» Non-professionals are not allowed to perform withstand voltage tests on the inverter, , otherwise damage to the inverter may occur.

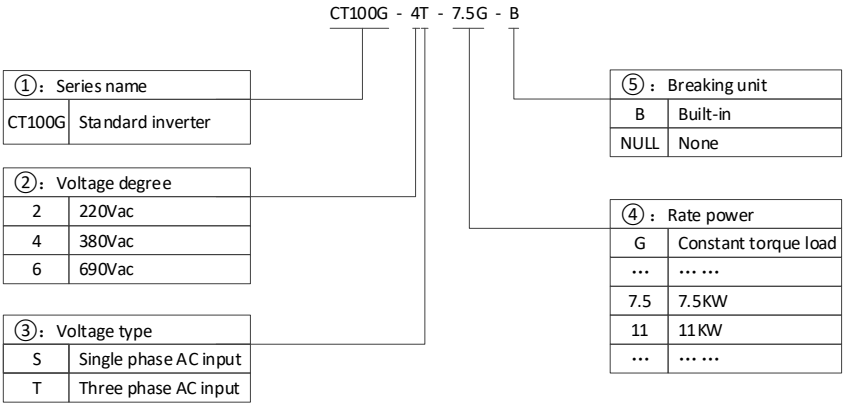
» Deal with the devices as industrial effluent after scrapping. Burning is strictly prohibited, otherwise an explosion may occur.

» The cooling effect of the inverter is reduced and the electrolytic capacitor electrolyte is also volatile in high altitude areas, which will shorten the life of the inverter. Check the altitude of the actual usage site is below 1000m. If higher than 1000m, reduce 1% for every additional 100m.

CHAPTER 1 PRODUCT INFORMATION

1.1 Product model name rules

The letters and numbers of the type designation key indicate product series, voltage, power, load etc.



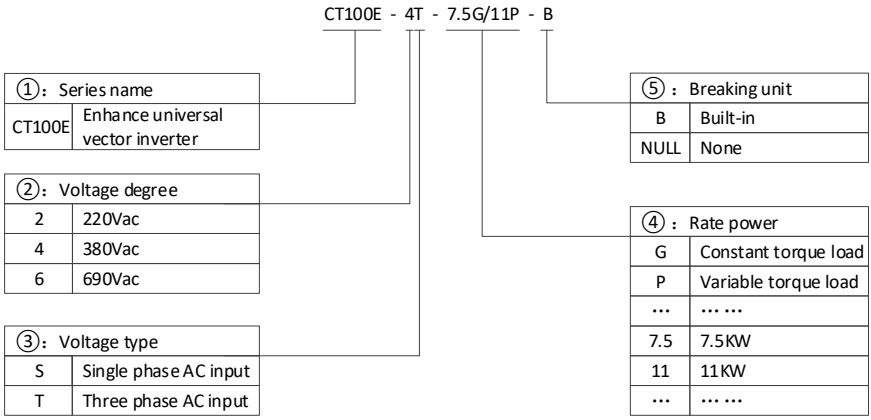


Figure 1-1 Type designation key

1.2 Product specifications and technical parameters

1.2.1 Product specifications

Table 1-1 Product Specifications

Inverter mode	Power（KW）	Input current（A）	Output current（A）	Applicable motor power（KW）
CT100G Single phase 220V 50/60Hz				
CT100G-2S-0.7G-B	0.75	8.2	4.5	0.75
CT100G-2S-1.5G-B	1.5	14.0	7.0	1.5
CT100G-2S-2.2G-B	2.2	23.0	9.6	2.2
CT100E Single phase 220V 50/60Hz				
CT100E-2S-0.7G-B	0.75	8.2	4.5	0.75
CT100E-2S-1.5G-B	1.5	14.0	7.0	1.5
CT100E-2S-2.2G-B	2.2	23.0	9.6	2.2
CT100G Three phase 380V 50/60Hz				
CT100G-4T-0.7G-B	0.75	3.4	2.5	0.75
CT100G-4T-1.5G-B	1.5	5.0	3.7	1.5
CT100G-4T-2.2G-B	2.2	5.8	5.3	2.2
CT100G-4T-4.0G-B	4.0	12.0	9.5	4.0
CT100G-4T-5.5G-B	5.5	18.5	14	5.5
CT100G-4T-7.5G-B	7.5	22.5	18.5	7.5
CT100G-4T-11G-B	11	30.0	25.0	11
CT100G-4T-15G-B	15	39.0	32.0	15
CT100G-4T-18.5G-B	18.5	45.0	38.0	18.5
CT100G-4T-22G-B	22	54.0	45.0	22
CT100G-4T-30G-B	30	68.0	60.0	30
CT100G-4T-37G	37	84.0	75.0	37
CT100G-4T-45G	45	98.0	92.0	45
CT100G-4T-55G	55	123.0	115.0	55
CT100G-4T-75G	75	157.0	150.0	75
CT100G-4T-90G	90	188.0	180.0	90
CT100G-4T-110G	110	221.0	215.0	110
CT100G-4T-132G	132	267.0	260.0	132
CT100G-4T-160G	160	309.0	305.0	160
CT100G-4T-185G	185	344.0	340.0	185
CT100G-4T-200G	200	384.0	380.0	200
CT100G-4T-220G	220	429.0	425.0	220
CT100G-4T-250G	250	484.0	480.0	250
CT100G-4T-280G	280	539.0	530.0	280
CT100G-4T-315G	315	612.0	600.0	315
CT100G-4T-355G	355	665.0	650.0	355
CT100G-4T-400G	400	715.0	720.0	400
CT100G-4T-450G	450	805	795.0	450

Inverter mode	Power（KW）	Input current（A）	Output current（A）	Applicable motor power（KW）
CT100G-4T-500G	500	890	860.0	500
CT100G-4T-560G	560	1045	1015	560
CT100G-4T-630G	630	1224	1200	630
CT100G-4T-710G	710	1330	1300	710
CT100G-4T-800G	800	1460	1440	800
CT100G-4T-900G	900	1560	1520	900
CT100G-4T-1000G	1000	1760	1720	1000
CT100E Three phase 380V 50/60Hz				
CT100E-4T-0.7G-B	0.75	3.4	2.5	0.75
CT100E-4T-1.5G-B	1.5	5.0	3.7	1.5
CT100E-4T-2.2G-B	2.2	5.8	5.3	2.2
CT100E-4T-4.0G/5.5P-B	4.0	12.0	9.5	4.0
	5.5	18.5	14	5.5
CT100E-4T-5.5G/7.5P-B	5.5	18.5	14	5.5
	7.5	22.5	18.5	7.5
CT100E-4T-7.5G/11P-B	7.5	22.5	18.5	7.5
	11	30.0	25.0	11
CT100E-4T-11G/15P-B	11	30.0	25.0	11
	15	39.0	32.0	15
CT100E-4T-15G/18.5P-B	15	39.0	32.0	15
	18.5	45.0	38.0	18.5
CT100E-4T-18.5G/22P-B	18.5	45.0	38.0	18.5
	22	54.0	45.0	22
CT100E-4T-22G/30P-B	22	54.0	45.0	22
	30	68.0	60.0	30
CT100E-4T-30G/37P	30	68.0	60.0	30
	37	84.0	75.0	37
CT100E-4T-37G/45P	37	84.0	75.0	37
	45	98.0	92.0	45
CT100E-4T-45G/55P	45	98.0	92.0	45
	55	123.0	115.0	55
CT100E-4T-55G/75P	55	123.0	115.0	55
	75	157.0	150.0	75
CT100E-4T-75G/90P	75	157.0	150.0	75
	90	188.0	180.0	90
CT100E-4T-90G/110P	90	188.0	180.0	90
	110	221.0	215.0	110
CT100E-4T-110G/132P	110	221.0	215.0	110
	132	267.0	260.0	132
CT100E-4T-132G/160P	132	267.0	260.0	132
	160	309.0	305.0	160
CT100E-4T-160G/185P	160	309.0	305.0	160
	185	344.0	340.0	185

Inverter mode	Power（KW）	Input current（A）	Output current（A）	Applicable motor power（KW）
CT100E-4T-185G/200P	185	344.0	340.0	185
	200	384.0	380.0	200
CT100E-4T-200G/220P	200	384.0	380.0	200
	220	429.0	425.0	220
CT100E-4T-220G/250P	220	429.0	425.0	220
	250	484.0	480.0	250
CT100E-4T-250G/280P	250	484.0	480.0	250
	280	539.0	530.0	280
CT100E-4T-280G/315P	280	539.0	530.0	280
	315	612.0	600.0	315
CT100E-4T-315G/355P	315	612.0	600.0	315
	355	665.0	650.0	355
CT100E-4T-355G	355	665.0	650.0	355
CT100E-4T-400G	400	715	720	400
CT100E-4T-450G	450	805	795.0	450
CT100E-4T-500G	500	890	860	500
CT100E-4T-560G	560	1045	1015	560
CT100E-4T-630G	630	1224	1200	630
CT100E-4T-710G	710	1330	1300	710
CT100E-4T-800G	800	1460	1440	800
CT100E-4T-900G	900	1560	1520	900
CT100E-4T-1000G	1000	1760	1720	1000
CT100G Three phase 690V 50/60Hz				
CT100G-6T-22G	22	38	28	22
CT100G-6T-30G	30	40	35	30
CT100G-6T-37G	37	47	45	37
CT100G-6T-45G	45	55	52	45
CT100G-6T-55G	55	65	63	55
CT100G-6T-75G	75	85	86	75
CT100G-6T-90G	90	95	98	90
CT100G-6T-110G	110	118	121	110
CT100G-6T-132G	132	145	150	132
CT100G-6T-160G	160	165	175	160
CT100G-6T-185G	185	198	198	185
CT100G-6T-200G	200	210	218	200
CT100G-6T-220G	220	228	240	220
CT100G-6T-250G	250	255	270	250
CT100G-6T-280G	280	290	320	280
CT100G-6T-315G	315	334	350	315
CT100G-6T-350G	350	362	380	350
CT100G-6T-400G	400	411	430	400
CT100G-6T-450G	450	464	485	450

Inverter mode	Power（KW）	Input current（A）	Output current（A）	Applicable motor power（KW）
CT100G-6T-500G	500	518	540	500
CT100G-6T-560G	560	578	600	560
CT100G-6T-630G	630	655	680	630
CT100G-6T-710G	710	724	750	710
CT100G-6T-800G	800	822	860	800
CT100E Three phase 690V 50/60Hz				
CT100E-6T-22G	22	38	28	22
CT100E-6T-30G	30	40	35	30
CT100E-6T-37G	37	47	45	37
CT100E-6T-45G	45	55	52	45
CT100E-6T-55G	55	65	63	55
CT100E-6T-75G	75	85	86	75
CT100E-6T-90G	90	95	98	90
CT100E-6T-110G	110	118	121	110
CT100E-6T-132G	132	145	150	132
CT100E-6T-160G	160	165	175	160
CT100E-6T-185G	185	198	198	185
CT100E-6T-200G	200	210	218	200
CT100E-6T-220G	220	228	240	220
CT100E-6T-250G	250	255	270	250
CT100E-6T-280G	280	290	320	280
CT100E-6T-315G	315	334	350	315
CT100E-6T-355G	355	362	380	355
CT100E-6T-400G	400	411	430	400
CT100E-6T-450G	450	464	485	450
CT100E-6T-500G	500	518	540	500
CT100E-6T-560G	560	578	600	560
CT100E-6T-630G	630	655	680	630
CT100E-6T-710G	710	724	760	710
CT100E-6T-800G	800	822	860	800

Note：1. The inverter with power below CT100E-4T-110G/132P (inclusive) and CT100G-4T-160G(inclusive) are able to have built-in braking unit, among which CT100E-4T-37G/45P ~ CT100E-4T-110G/132P and CT100G-4T-37G ~ CT100G-4T-160G built-in braking unit is optional. The power and resistance of the braking resistor must meet the requirements, otherwise there is a risk of product damage. The inverter braking units of CT100E-4T-132G/160P,CT100G-4T-185G and above power are all external and need to be purchased by the customer

2. C7,C8,C11,C12 and C13 model are optional with base.

3. The above models are standard general models and do not include special models for industry applications. Non-standard models with other specifications can be customized.

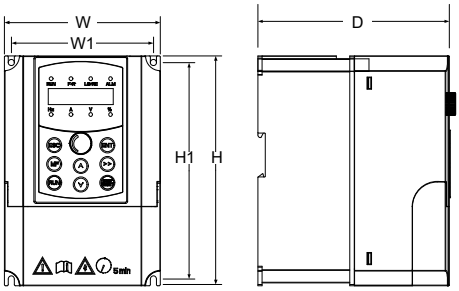
1.2.2 Technical parameters

Table 1-2 Technical parameters

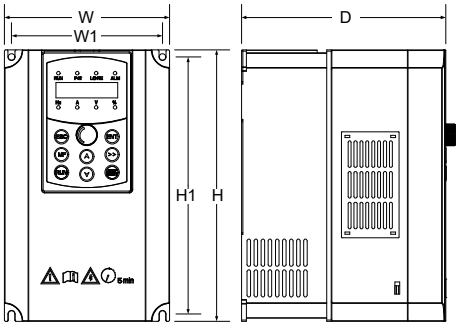
Input and output parameters	Input voltage	Single-phase 220VAC±15%,Three phase 380VAC±15%,Three phase 690VAC±15%
	Input frequency	50～60Hz±5%
	Output voltage	0～Rated input voltage
	Output frequency	0～500Hz,unit0.01Hz
	Overload capacity	150% of rated current:1min;180%of rated current :10s;200% of rated current:1s
Running control parameters	Control mode	V/F;sensorless vector control (SVC)
	Adjustable-speed ratio	1:100(V/F);1:200(SVC)
	Speed control accuracy	± 0.5%
	Speed wave	± 0.5%
	Start torque	0.5Hz/150%(V/F); 0.25Hz/150% (SVC)
Based functions	Starting frequency	0.00～10.00Hz
	ACC and DEC time	0.1～65000.0s
	Carrier frequency	0.5KHz～16.0KHz
	Frequency setting	UP/DOW setting, analog setting, digital setting, multi-step speed setting, PID setting, MODBUS communication setting, to realize switch of combination and channel setting.
	Start mode	Start frequency, DC braking and start
	Stop mode	DEC stop, free stop, DEC+DC braking
	Energy braking capability	Braking unit braking voltage:320～750V
	DC braking capability	DC braking frequency: 0～500Hz; DC braking waiting time: 0～100s; DC braking current: 0.0～100.0%; DC braking time: 0.0～100.0s;
	Auto voltage adjustment	Keep a stable output voltage automatically when the grid voltage transients
	Sudden frequency down	Keep stable bus voltage while power net low-voltage
Control terminals	Digital input	Standard 5-channel inputs, one of which can be high-speed pulse input (HDI)
	Analog input	Standard 2-channel inputs, AI1, AI2(0～10V or 0/4~20mA output optional)
	Digital output	Standard 2-channel multi-function collector outputs, one of which can be high-speed pulse output (HDO).
	Analog output	Standard 2-channel outputs, AO1, AO2(0～10V or 0/4~20mA output optional)
	Relay output	Standard 2-channel relay outputs
Communication interface	RS485 Communication	RS485 communication interface for external communication, support Modbus protocol (RTU mode).

Fault protection	ACC overcurrent, DEC overcurrent, constant speed overcurrent, ACC overvoltage, DEC overvoltage, constant speed overvoltage, bus under voltage, motor overload, inverter overload, input power failure, output phase loss, rectifier module overheating, inverter module overheating, external fault, communication fault, current detection fault, EEPROM operation fault, PID feedback fault, factory setting time arrive etc.	
Keypad display	LED display	Highlight LED digital tube displays the inverter information
Others	Running environment	Indoors, less than 1km above sea level, without dust, corrosive gases or direct sunlight
	Ambient temperature	-10～+40℃, derate 1% for every additional 1℃ when the ambient temperature is between 40～50℃
	Humidity	5～95% (no condensation)
	Altitude	0～2000m, derate 1% for every additional 100m when the sea level is above 1000m
	Vibration	Less than 0.5G
	Storage temperature	−40～+70℃

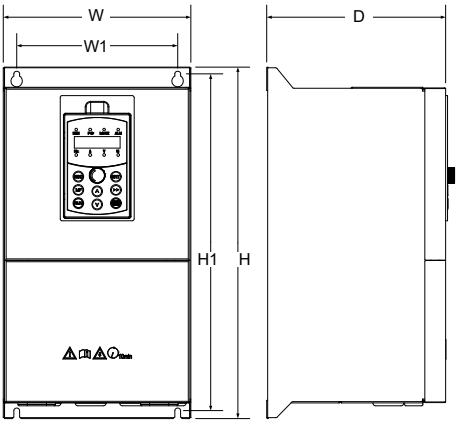
1.3 Product outline and installation size, weight



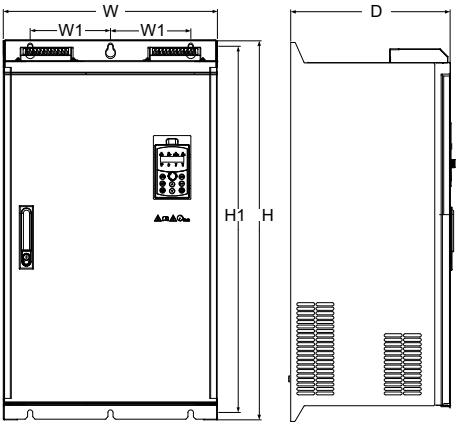
a) C0 models



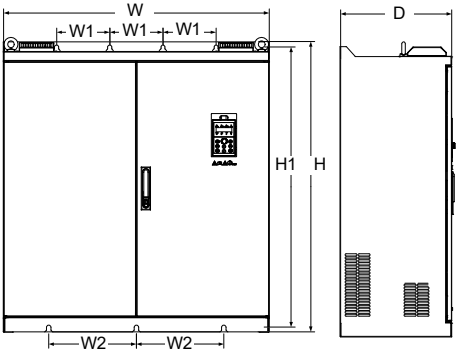
b) C1, C2 models



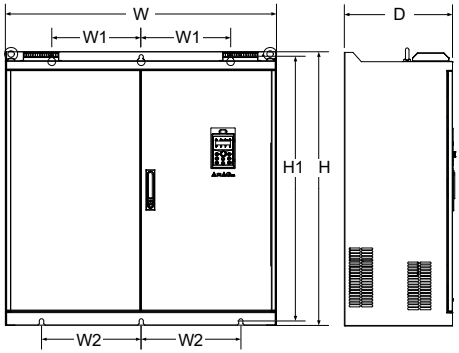
c) C3~C6 models



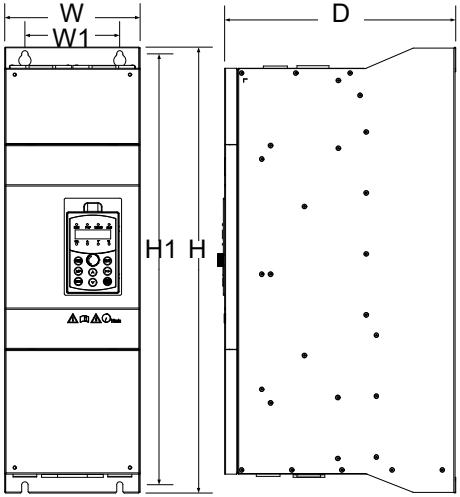
d) C7, C8 models



e) C11 models



f) C12,C13models



g) C23models

Figure 1-2 Product appearance and installation dimensions diagram

Table 1-3 CT100E Structure, mounting dimension and weight

Inverter mode	Appearance and dimensions(mm)						Installing hole(mm)	Weight (kg)	Cabinet
	W	H	D	W1	W2	H1			
CT100E-2S-0.7G-B	126	186	155	115	---	175	5	1.5	C0
CT100E-2S-1.5G-B									
CT100E-2S-2.2G-B									
CT100E-4T-0.7G-B									
CT100E-4T-1.5G-B									
CT100E-4T-2.2G-B									
CT100E-4T-4.0G/5.5P-B									
CT100E-4T-5.5G/7.5P-B	140	230	172	128	---	218	5.5	3.5	C1

Inverter mode	Appearance and dimensions(mm)						Installing hole(mm)	Weight (kg)	Cabinet
	W	H	D	W1	W2	H1			
CT100E-4T-7.5G/11P-B	165	285	200	153	---	273	5.5	5.2	C2
CT100E-4T-11G/15P-B									
CT100E-4T-15G/18.5P-B	214	402	205	184	---	385	7	11.5	C3
CT100E-4T-18.5G/22P-B									
CT100E-4T-22G/30P-B									
CT100E-4T-30G/37P	250	442	230	220	---	425	7	19	C4
CT100E-4T-37G/45P									
CT100E-4T-45G/55P	300	600	280	240	---	580	9	30	C5
CT100E-4T-55G/75P									
CT100E-4T-75G/90P									
CT100E-4T-90G/110P									
CT100E-4T-110G/132P	329	660	330	250	---	640	9	56	C6
CT100E-4T-132G/160P									
CT100E-4T-160G/185P	480	853	354	180	---	826	12	106	C7
CT100E-4T-185G/200P									
CT100E-4T-200G/220P									
CT100E-4T-220G/250P									
CT100E-4T-250G/280P									
CT100E-4T-280G/315P	680	940	370	290	---	900	14	151	C8
CT100E-4T-315G/355P									
CT100E-4T-355G									
CT100E-4T-400G									
CT100E-4T-450G	880	962	370	176	290	928	15	200	C11
CT100E-4T-500G									
CT100E-4T-560G	950	962	380	314	350	928	16		C12
CT100E-4T-630G									
CT100E-4T-710G	1250	1249	480	471	471	1204	14		C13
CT100E-4T-800G									
CT100E-4T-900G									
CT100E-4T-1000G									
CT100E-6T-22G	200	658	341	140	---	636	9	30	C23
CT100E-6T-30G									
CT100E-6T-37G	300	600	280	240	---	580	9	30	C5
CT100E-6T-45G									
CT100E-6T-55G									
CT100E-6T-75G									
CT100E-6T-90G									
CT100E-6T-110G	329	660	332	250	---	640	9	56	C6
CT100E-6T-132G									
CT100E-6T-160G									
CT100E-6T-185G									

Inverter mode	Appearance and dimensions(mm)						Installing hole(mm)	Weight (kg)	Cabinet
	W	H	D	W1	W2	H1			
CT100E-6T-200G	480	853	354	180	---	826	12	110	C7
CT100E-6T-220G									
CT100E-6T-250G									
CT100E-6T-280G									
CT100E-6T-315G									
CT100E-6T-355G	680	940	370	290	---	908	14	165	C8
CT100E-6T-400G									
CT100E-6T-500G									
CT100E-6T-560G	880	962	370	176	290	928	15	200	C11
CT100E-6T-630G									
CT100E-6T-710G	950	962	380	314	350	928	16		C12
CT100E-6T-800G									

Table 1-4 CT100G Structure, mounting dimension and weight

Inverter mode	Appearance and dimensions(mm)						Installing hole(mm)	Weight (kg)	Cabinet
	W	H	D	W1	W2	H1			
CT100G-2S-0.7G-B	126	186	155	115	---	175	5	1.6	C0
CT100G-2S-1.5G-B									
CT100G-2S-2.2G-B									
CT100G-4T-0.7G-B									
CT100G-4T-1.5G-B									
CT100G-4T-2.2G-B									
CT100G-4T-4.0G-B									
CT100G-4T-5.5G-B									
CT100G-4T-7.5G-B	140	230	172	128	---	218	5.5	3.5	C1
CT100G-4T-11G-B	165	285	200	153	---	273	5.5	5.2	C2
CT100G-4T-15G-B									
CT100G-4T-18.5G-B	214	402	205	184	---	385	7	11.5	C3
CT100G-4T-22G-B									
CT100G-4T-30G-B									
CT100G-4T-37G	250	442	230	220	---	425	7	19	C4
CT100G-4T-45G									
CT100G-4T-55G	300	600	280	240	---	580	9	30	C5
CT100G-4T-75G									
CT100G-4T-90G									
CT100G-4T-110G									
CT100G-4T-132G	329	660	330	250	---	640	9	56	C6
CT100G-4T-160G									
CT100G-4T-185G	480	853	354	180	---	826	12	110	C7
CT100G-4T-200G									
CT100G-4T-220G									

Inverter mode	Appearance and dimensions(mm)						Installing hole(mm)	Weight (kg)	Cabinet
	W	H	D	W1	W2	H1			
CT100G-4T-250G									
CT100G-4T-280G									
CT100G-4T-315G									
CT100G-4T-355G	680	940	370	290	---	908	14	165	C8
CT100G-4T-400G									
CT100G-4T-450G	880	962	370	176	290	928	15	200	C11
CT100G-4T-500G									
CT100G-4T-560G	950	962	380	314	350	928	16		C12
CT100G-4T-630G									
CT100G-4T-710G									
CT100G-4T-800G	1250	1249	480	471	471	1204	14		C13
CT100G-4T-900G									
CT100G-4T-1000G									
CT100G-6T-22G	220	658	341	140	---	636	9	21	C23
CT100G-6T-30G									
CT100G-6T-37G									
CT100G-6T-45G									
CT100G-6T-55G	300	600	280	240	---	580	9	30	C5
CT100G-6T-75G									
CT100G-6T-90G									
CT100G-6T-110G									
CT100G-6T-132G	329	660	332	250	---	640	9	56	C6
CT100G-6T-160G									
CT100G-6T-185G									
CT100G-6T-200G									
CT100G-6T-220G									
CT100G-6T-250G	480	853	354	180	---	826	12	110	C7
CT100G-6T-280G									
CT100G-6T-315G									
CT100G-6T-350G									
CT100G-6T-400G	680	940	370	290	---	908	14	165	C8
CT100G-6T-450G									
CT100G-6T-500G									
CT100G-6T-560G	880	962	370	176	290	928	15	200	C11
CT100G-6T-630G									
CT100G-6T-710G	950	962	380	314	350	928	16		C12
CT100G-6T-800G									

1.4 Outline and size of keypad

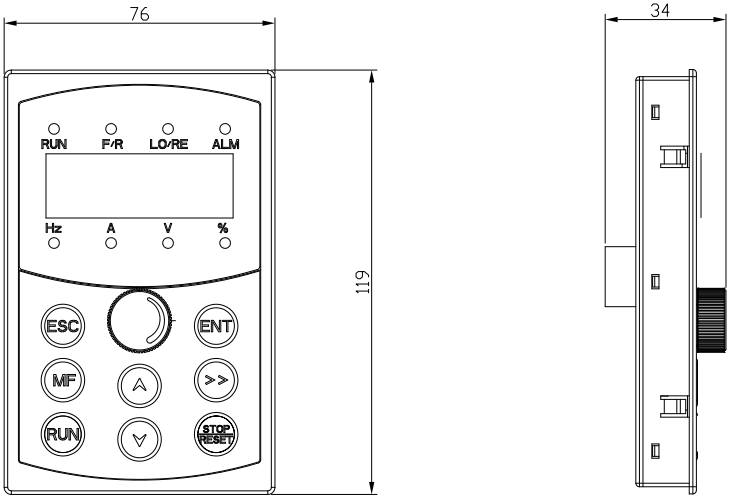


Figure 1-3 Structure diagram of the keypad (unit: mm)

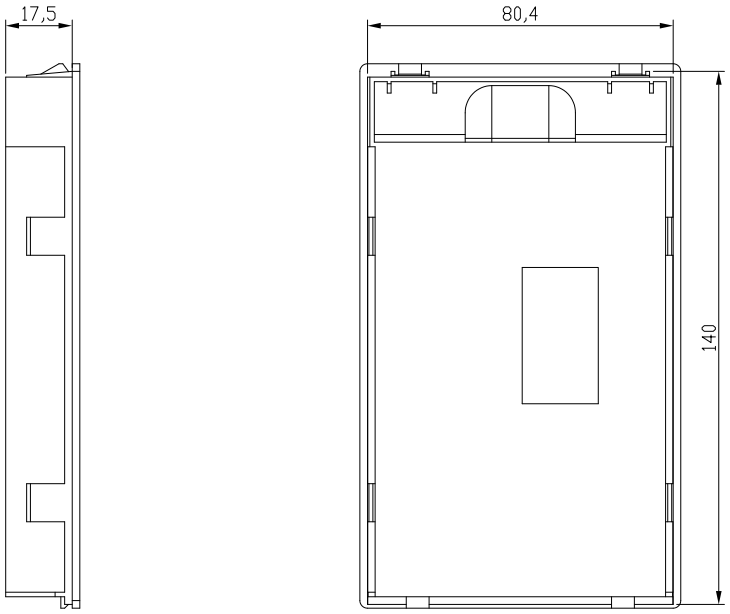


Figure 1-4 Structure diagram of the outer bracket (unit: mm)

Note: while use external keypad, the wire should not be more than 30m, otherwise there is risk of keypad not work.

CHAPTER 2 INSTALLATION AND WIRING

2.1 Installation environment

1. Ambient temperature: -10℃～+40℃, derate to use if the temperature is above 40℃.
2. Relative humidity: ≤ 95%, no condensation.
3. Vibration: ＜0.5G.
4. The inverter should be installed on the flame-retardant materials and there is enough space for heat dissipation.
5. The inverter can output the rated power when the altitude is below 1000m. If the altitude is above 1000m, the output power will decrease. It is recommended to derate 1% for every additional 100m.
6. The inverter is not allowed to fall to the ground suddenly.
7. The inverter is not allowed to be installed near the electromagnetic radiation sources.
8. The inverter is not allowed to be installed in the atmospheres with flammable, explosive or corrosive gases.
9. The inverter is not allowed to be installed in the environments with direct sunlight, oil mist or steam.
10. Avoid screws, cables, drilling debris and other conductive matters falling into the inverter during installation, otherwise it may cause the inverter failure.
11. For the bad installation environments (like textile industry), it is recommended to install the radiator outside the cabinet.

2.2 Installation and disassembly of the keypad and the cover plate

2.2.1 Functions of peripheral components

Table 2-1 Functions of peripheral components

Name	Functions
Circuit breaker	Cut off the power and protect the latter when the latter devices have failure. Select the circuit breaker of the breaking current by 2 times of the inverter.
Leakage protector	PWM high frequency chopper voltage output causes high frequency leakage current, so select a special leakage protector.
Contactor	Frequent switching on-off the contactor causes inverter failure, so do not start or stop the inverter by switching on-off the main circuit, which will affect the life of the inverter.
Input reactor and DC reactor	Improve the input power factor; Reduce the impact on the system caused by the unbalance of input power; Suppress high harmonics and reduce external conduction; Suppress the interference on the rectifier bridge caused by the pulse current.
Input and output filters	Reduce the interference of the inverter on peripheral devices.
Braking unit and braking resistor	Consume the feedback energy from motors and brake rapidly during braking.
Output reactor	Reduce the protection of the inverter due to leakage current; When the cable connecting the inverter and the motor is more than 50m, it is recommended to install the output reactor.

2.2.2 Standard configuration of peripheral components

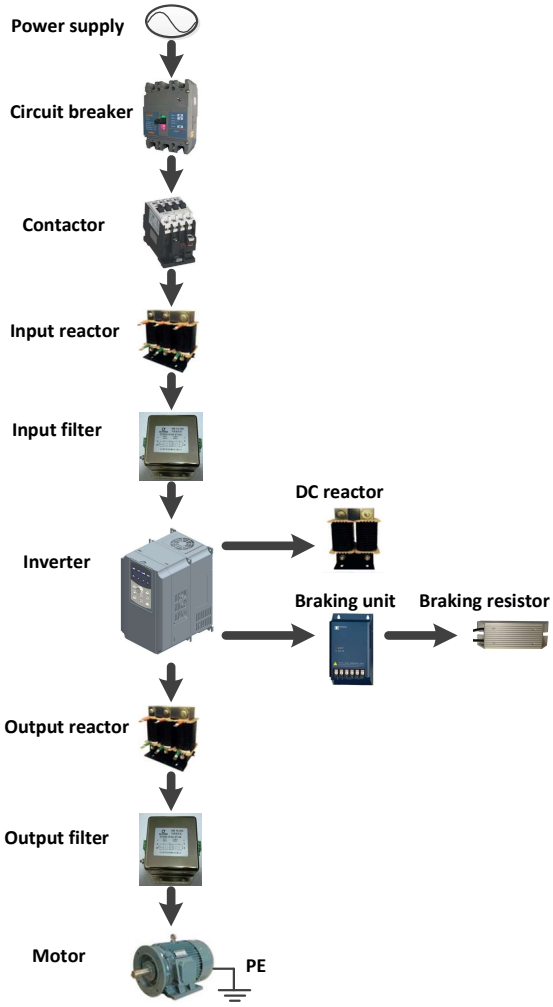


Figure 2-1 Standard peripheral components

2.2.3 Specifications of cables, circuit breakers and contactors

Table 2-2 Recommendation of Peripheral components

Inverter mode	Cables (m^2)	Circuit breaker (A)	Contactor (A)	Braking units &resistors	
				Power (KW)	Resist (Ω)
CT100G series					
CT100G-2S-0.7G-B	2.5	16	10	≧0.3	≧200
CT100G-2S-1.5G-B	4	20	16	≧0.3	≧150
CT100G-2S-2.2G-B	4	32	25	≧0.3	≧85
CT100G-4T-0.7G-B	2.5	10	10	≧0.3	≧320
CT100G-4T-1.5G-B	2.5	16	10	≧0.3	≧250
CT100G-4T-2.2G-B	2.5	16	10	≧0.3	≧150
CT100G-4T-4.0G-B	4	25	16	≧0.75	≧85
CT100G-4T-5.5G-B	4	32	25	≧1	≧58
CT100G-4T-7.5G-B	4	40	32	≧1.3	≧43
CT100G-4T-11G-B	4	63	40	≧1.8	≧32
CT100G-4T-15G-B	6	63	40	≧2.5	≧25
CT100G-4T-18.5G-B	6	100	65	≧3	≧20
CT100G-4T-22G-B	10	100	65	≧5	≧17.5
CT100G-4T-30G-B	16	125	80	≧6	≧13
CT100G-4T-37G-B	16	160	80	≧7.5	≧10
CT100G-4T-45G-B	25	200	95	≧8.5	≧8
CT100G-4T-55G-B	35	200	125	≧12	≧7
CT100G-4T-75G-B	50	250	160	≧14	≧5.3
CT100G-4T-90G-B	70	250	160	≧16	≧4.5
CT100G-4T-110G-B	95	350	350	≧21	≧3.7
CT100G-4T-132G-B	150	400	400	≧26	≧3.3
CT100G-4T-160G-B	185	500	400	≧31	≧3.0
CT100G-4T-185G	240	630	400	External braking units and resistors are chosen according to braking units.	
CT100G-4T-200G	150*2	630	630		
CT100G-4T-220G	150*2	630	630		
CT100G-4T-250G	185*2	800	630		
CT100G-4T-285G	150*3	800	800		
CT100G-4T-315G	150*3	800	800		
CT100G-4T-355G	150*3	1280	960		
CT100G-4T-400G	150*4	1380	1035		
CT100G-4T-450G	150*4	1580	1185		
CT100G-4T-500G	150*4	1720	1290		
CT100G-4T-560G	185*4	2030	1525		
CT100G-4T-630G	240*4	2400	1800		
CT100G-6T-22G	6	63	40	≧15	≧15
CT100G-6T-30G	6	100	65		
CT100G-6T-37G	10	100	65		
CT100G-6T-45G	16	125	80		
CT100G-6T-55G	16	160	80	External braking units and	

Inverter mode	Cables (m^2)	Circuit breaker (A)	Contactor (A)	Braking units &resistors	
				Power (KW)	Resist (Ω)
CT100G-6T-75G	25	200	95	resistors are chosen according to braking units.	
CT100G-6T-90G	35	200	125		
CT100G-6T-110G	50	250	160		
CT100G-6T-132G	70	250	160		
CT100G-6T-160G	95	350	350		
CT100G-6T-185G	150	400	400		
CT100G-6T-200G	185	500	400		
CT100G-6T-220G	240	630	400		
CT100G-6T-250G	150*2	630	630		
CT100G-6T-280G	150*2	630	630		
CT100G-6T-315G	185*2	800	630		
CT100G-6T-350G	150*3	800	800		
CT100G-6T-400G	150*3	800	800		
CT100G-6T-450G	150*3	1280	960		
CT100G-6T-500G	150*3	1280	960		
CT100G-6T-560G	150*4	1380	1035		
CT100G-6T-630G	150*4	1720	1290		
CT100E series					
CT100E-2S-0.7G-B	2.5	16	10	≧0.3	≧200
CT100E-2S-1.5G-B	4	20	16	≧0.3	≧150
CT100E-2S-2.2G-B	4	32	25	≧0.3	≧85
CT100E-4T-0.7G-B	2.5	10	10	≧0.3	≧320
CT100E-4T-1.5G-B	2.5	16	10	≧0.3	≧250
CT100E-4T-2.2G-B	2.5	16	10	≧0.3	≧150
CT100E-4T-4.0G/5.5P-B	4	25	16	≧0.75	≧85
CT100E-4T-5.5G/7.5P-B	4	32	25	≧1	≧58
CT100E-4T-7.5G/11P-B	4	40	32	≧1.3	≧43
CT100E-4T-11G/15P-B	4	63	40	≧1.8	≧32
CT100E-4T-15G/18.5P-B	6	63	40	≧2.5	≧25
CT100E-4T-18.5G/22P-B	6	100	65	≧3	≧20
CT100E-4T-22G/30P-B	10	100	65	≧5	≧17.5
CT100E-4T-30G/37P-B	16	125	80	≧6	≧13
CT100E-4T-37G/45P-B	16	160	80	≧7.5	≧10
CT100E-4T-45G/55P-B	25	200	95	≧8.5	≧8
CT100E-4T-55G/75P-B	35	200	125	≧12	≧7
CT100E-4T-75G/90P-B	50	250	160	≧14	≧5.3
CT100E-4T-90G/110P-B	70	250	160	≧16	≧4.5
CT100E-4T-110G/132P-B	95	350	350	≧21	≧3.7
CT100E-4T-132G/160P	150	400	400	≧26	≧3.3
CT100E-4T-160G/185P	185	500	400	≧31	≧3.0

Inverter mode	Cables (m^2)	Circuit breaker (A)	Contactor (A)	Braking units &resistors	
				Power (KW)	Resist (Ω)
CT100E-4T-185G/200P	240	630	400	External braking units and resistors are chosen according to braking units.	
CT100E-4T-200G/220P	150*2	630	630		
CT100E-4T-220G/250P	150*2	630	630		
CT100E-4T-250G/285P	185*2	800	630		
CT100E-4T-285G/315P	150*3	800	800		
CT100E-4T-315G/355P	150*3	800	800		
CT100E-4T-355G	150*3	1280	960		
CT100E-4T-400G	150*4	1380	1035		
CT100E-4T-450G	150*4	1580	1185		
CT100E-4T-500G	150*4	1720	1290		
CT100E-4T-560G	185*4	2030	1525		
CT100E-4T-630G	240*4	2400	1800		
CT100E-6T-22G	6	63	40	≧15	≧15
CT100E-6T-30G	6	100	65		
CT100E-6T-37G	10	100	65		
CT100E-6T-45G	16	125	80		
CT100E-6T-55G	16	160	80	External braking units and resistors are chosen according to braking units.	
CT100E-6T-75G	25	200	95		
CT100E-6T-90G	35	200	125		
CT100E-6T-110G	50	250	160		
CT100E-6T-132G	70	250	160		
CT100E-6T-160G	95	350	350		
CT100E-6T-185G	150	400	400		
CT100E-6T-200G	185	500	400		
CT100E-6T-220G	240	630	400		
CT100E-6T-250G	150*2	630	630		
CT100E-6T-280G	150*2	630	630		
CT100E-6T-315G	185*2	800	630		
CT100E-6T-355G	150*3	800	800		
CT100E-6T-400G	150*3	800	800		
CT100E-6T-450G	150*3	1280	960		
CT100E-6T-500G	150*3	1280	960		
CT100E-6T-560G	150*4	1380	1035		
CT100E-6T-630G	150*4	1720	1290		

Note: When a braking unit is built in, the power and resistance of the braking resistor should meet the requirements in the table, otherwise the product may be damaged. When the braking resistor is external, it needs to be purchased by the customer.

2.3 Main electric loop terminal

2.3.1 Functions of the main circuit terminals

Table 2-3 Functions of the main circuit terminals

Terminals	Function
R, S, T	Three-phase power input terminals
(+), (-)	Reserved terminals for external braking units, common DC bus terminals
(+), PB	Reserved terminals for external braking resistors
P1, (+)	Reserved terminals for external DC reactors
(-)	DC negative bus output terminal
U, V, W	Three-phase AC output terminals
⏚	Grounding terminal (PE)

2.3.2 Standard wiring diagram

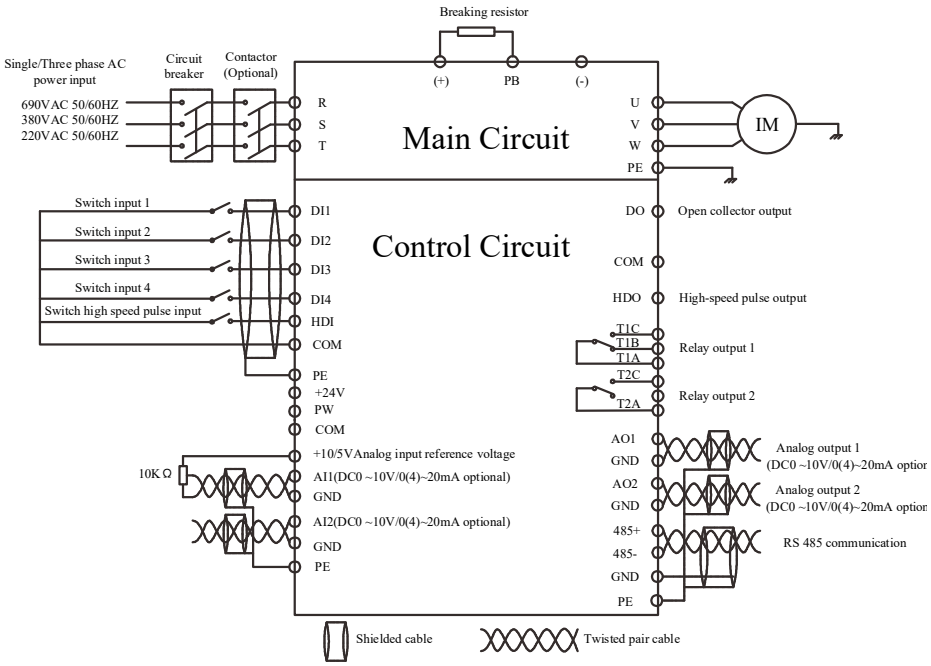


Figure 2-2 Standard wiring diagram

2.4 Control circuit connection

2.4.1 Precautions

Please apply the multi-core shielded cable or twisted pair to connect the control terminals. When using the shielded cable (near one side of the inverter), connect it to the PE terminal of the inverter. Keep the control cable away from the main circuit and strong power circuit (including power cables, motor cables, relays, contactors, etc.) more than 20cm. Vertical wiring is recommended instead of parallel wiring to prevent the inverter malfunction caused by external interference.

2.4.2 Schematic diagram of the control plate

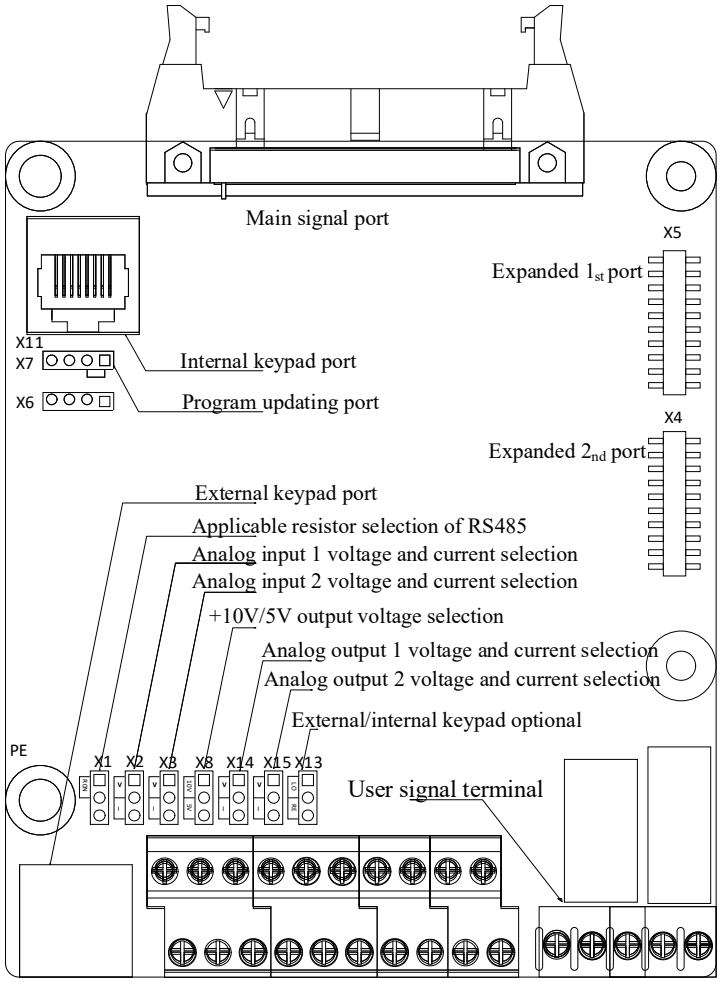


Figure 2-3 Schematic diagram of the CT100G&CT100E control plate

2.4.3 Pins of the control plate

Table 2-4 Pin instructions of the control plate

No.	Instructions	
X1	RS485 terminating resistor setting	
		Short circuit the pins 1 and 2 of X1 by short-circuit module, the terminating resistor of 120Ω is used for RS485 bus; Short circuit the pins 2 and 3 of X1 by short-circuit module, the terminating resistor is not used for RS485 bus; When the short-circuit module is not used, the terminating resistor is not used for RS485 bus.
X2	Analog input 1 voltage and current selection	
		Short circuit the pins 1 and 2 of X2 by short-circuit module, the analog input 1 is voltage input (0～10V); Short circuit the pins 2 and 3 of X2 by short-circuit module, the analog input 1 is current input (0/4～20mA); When the short-circuit module is not used, the analog input 1 is voltage input (0～10V).
X3	Analog input 2 voltage and current selection	
		Short circuit the pins 1 and 2 of X3 by short-circuit module, the analog input 2 is voltage output (0～10V); Short circuit the pins 2 and 3 of X3 by short-circuit module, the analog input 2 is current output (0/4～20mA). When the short-circuit module is not used, the analog input 2 is voltage input (0～10V).
X8	+10V/5V output voltage selection	
		Short circuit the pins 1 and 2 of X8 by short-circuit module, the terminal +10V/5V provide +10v power output. Short circuit the pins 2 and 3 of X8 by short-circuit module, the terminal +10V/5V provide +5v power output.
X13	External/internal keypad optional	
		Short circuit the pins 1 and 2 of X13 by short-circuit module, internal keypad(X11) is active,the external keypad(X10) is only to display. Short circuit the pins 2 and 3 of X13 by short-circuit module, the internal keypad(X11) is only to display,the external keypad(X10) is active.
X14	Analog output 1 voltage and current selection	
		Short circuit the pins 1 and 2 of X14 by short-circuit module, the analog output 1 is voltage output (0～10V); Short circuit the pins 2 and 3 of X14 by short-circuit module, the analog output 1 is current output (0/4～20mA). When the short-circuit module is not used, the analog output 1 is voltage output (0～10V).
X15	Analog output 2 voltage and current selection	
		Short circuit the pins 1 and 2 of X15 by short-circuit module, the analog output 2 is voltage output (0～10V); Short circuit the pins 2 and 3 of X15 by short-circuit module, the analog output 2 is current output (0/4～20mA). When the short-circuit module is not used, the analog output 2 is voltage output (0～10V).

2.4.4 Terminals of control circuit

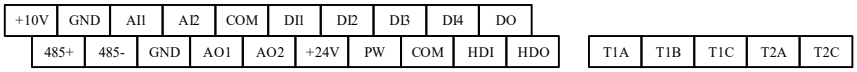


Figure 2-4 control board terminal label

2.4.5 Functions of the main circuit terminals

Table 2-5 Functions of the control board terminals

Category	Terminal name	Terminal function	Technical specification
Switch input	+24V	+24V power supply	24V±10%, internal isolation from GND. Max. load 200mA
	PW	External power input terminal (power supply of digital input terminal)	Short circuit with +24V by default
	DI1～DI4	Switch input terminals 1～4	Input specifications: 24V, 5mA
	HDI	High speed pulse input or switch input	Pulse input frequency range: 0～50kHz High level voltage: 24V
	COM	+24V power supply or external power ground	Internal isolation from GND
Switch output	DO	Open collector output, common CME terminal	External voltage range: 0～24V
	HDO	High speed pulse output or open collector output, common COM terminal	Pulse output frequency range: 0～50kHz
	COM	HDO common terminal	Internal isolation from GND
Analog input	+10V	The local supplies +10V or 5V power output	Output voltage: 10V or 5V available via X13, optional Output current range: 0～50mA (If the potentiometer is connected between +10V and GND, the resistance should not be less than 2kΩ.)
	AI1/AI2	Analog input terminal 1	Input voltage and current are optional Input voltage range: 0～10V Input current range: 0/4～20mA
	GND	Analog ground	Internal isolation from COM
Analog output	AO1/AO2	Analog output terminal	Output voltage and current are optional Output voltage range: 0～10V Output current range: 0/4～20mA
	GND	Analog ground	Internal isolation from COM
Relay output	T1A/TIB/TIC	Relay output	T1A-T1B: normally closed T1A-T1C: normally open Contact capacity: 250VAC/3A, 30VDC/1A
	T2A/T2C	Relay output	T2A-T2C: normally open Contact capacity: 250VAC/3A, 30VDC/1A
Communication interface	485+/485-	RS485 communication interface	RS485 communication interface

2.4.6 Wiring of switch inputs

By using the internal +24V power supply of the inverter, the wiring of the external controller for the NPN type sink current is as shown below:

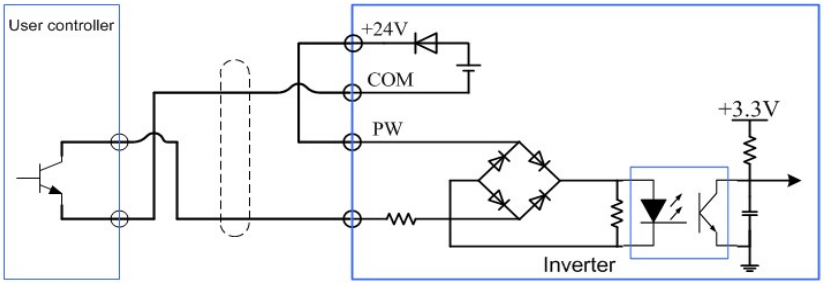


Figure 2-5 Wiring of NPN type sink current

By using the internal +24V power supply of the inverter, the wiring of the external controller for the PN type source current is as shown below:

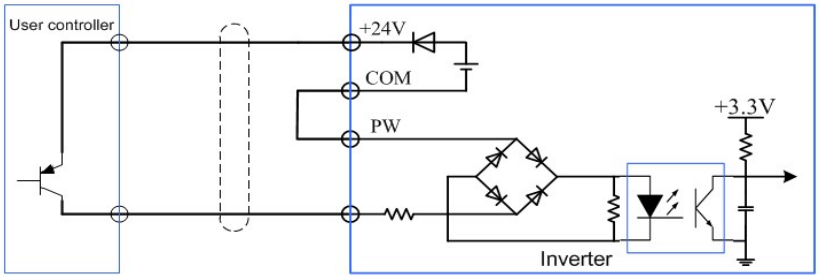


Figure 2-6 Wiring of PNP type source current

Note: Be sure to remove the short-circuit plate between +24V and PW and connect the plate between PW and COM.

By using the external power supply, the wiring of the external controller for the NPN type sink current is as shown below:

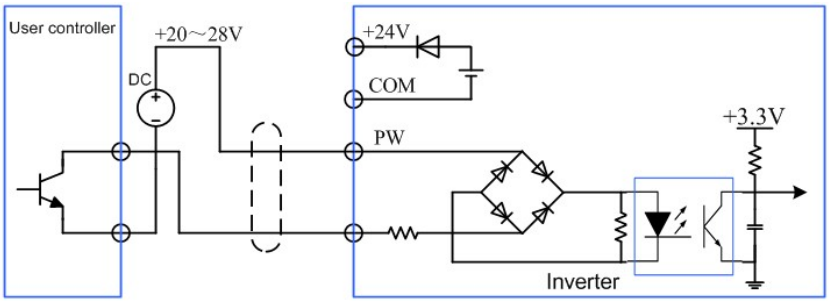


Figure 2-7 Wiring of NPN type sink current

Note: Be sure to remove the short-circuit plate between +24V and PW.

By using the external power supply, the wiring of the external controller for the PNP type source current is as shown below:

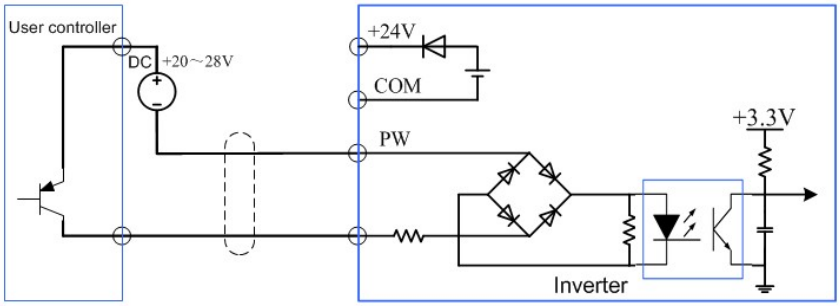


Figure 2-8 Wiring of PNP type source current

Note: Be sure to remove the short-circuit plate between +24V and PW.

CHAPTER 3 OPERATION AND POWER ON EXPLAIN

3.1 Keypad explain

The keypad consists of three parts for unit/status LEDs displaying, parameters displaying and key operation, as shown below.

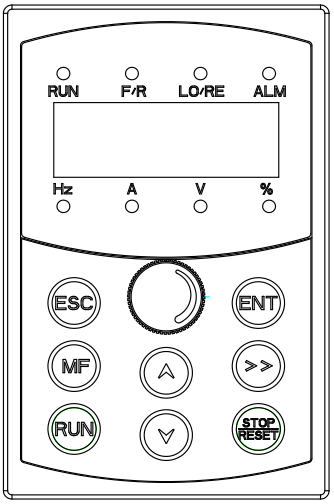


Figure 3-1 Keypad

3.1.1 Unit and status LED

Table 3-1 Unit and status LED indicator

Symbol		Name	meaning
Unit LEDs	Hz	Frequency LED	The unit of the current displayed parameter is Hz.
	A	Current LED	The unit of the current displayed parameter is A.
	V	Voltage LED	The unit of the current displayed parameter is V.
	%	Percentage LED	The current displayed parameter is a percentage.
Status LEDs	RUN	Run status LED	On: The inverter is running. Off: The inverter stopped. Blinking: The inverter is in dormant state.
	F/R	Forward/Reverse LED	On: The inverter is in the reverse running state. Off: The inverter is in the forward running state or stopped.
	LO/RE	Run command reference LED	Off: keypad run command reference mode Blinking: terminal run command reference mode On: communication run command reference mode
	ALM	Alarm LED	Off: no fault alarm Blinking: fault alarm or automatic study parameter On: torque control

3.1.2 Code displaying zone

5-figure LED display can display the monitoring data such as the set frequency and the output frequency and alarm codes.

3.1.3 Buttons

Table 3-2 Functions of buttons

Button	Name	Function
	Programming/ Exit key	Enter or exit the 1st level menu; Return to the 1st level menu from the 2nd level menu; Return to the 2nd level menu from the 3rd level menu.
	Multi-function key	Operate according to multi-function selection [2]
	Run key	In the keypad run command reference mode, the key is used for start control of the inverter. After setting the parameter self-identification, the key is used to start the inverter for parameter self-identification.
	Enter key	After function group confirmation of the 1st level menu, enter the 2nd level menu; After function group confirmation of the 2nd level menu, enter the 3rd level menu; After function parameters setting confirmation of the 3rd level menu, return to the 2nd level menu; In password verification state, the password input is completed.
	Right-shift key	Function group edit step [1] selection in the 1st/2nd level menu; Function parameters settings edit step selection in the 3rd level menu; In stop parameter display status, running parameter display status and fault display state, display parameters selection; Edit bit selection in password verification state.
	Stop/Reset key	In keypad run command reference mode, the key is used for stop control of the inverter; In other run command reference modes, the key is used for stop protection of the inverter [3]; At fault or stop state, the key is used as a reset key to clear the fault alarm information.
	UP key	Increase function group in the 1st/2nd level menu progressively; Increase function parameters settings in the 3rd level menu progressively; Increase the set frequency progressively.
	DOWN key	Decrease function group in the 1st/2nd level menu progressively; Decrease function parameters settings in the 3rd level menu progressively; Decrease the set frequency progressively.
	Potentiometer	Adjust the frequency; Adjust the torque.

Note: 1. Select the edit step to be ones, tens or hundreds via the right-shift key.

2. See function code (F05.04) for multi-function selection.

3. After sending a stop command, you need to run the clear command in the current run command reference mode.

3.2 Operation process

3.2.1 Parameter setting

The three-level menu is:

1. Group number of function code (first-level menu);
2. Tab of function code (second-level menu);
3. Set value of function code (third-level menu).

Note: 8.8.8.8.8 is displayed initially after power on and the digital reference frequency is displayed after initialization. When you need to modify the parameters, press ESC to enter the first-level menu and F00 will be displayed. Modify the function group by ⌒ or ⌣ to F00-F15, press ENT to enter the second-level menu, press ENT key again to enter the third-level menu, modify the parameters by ⌒ or ⌣, press ENT to write into the control board and press ESC to return.

In the third-level menu, if the bit of the parameter is not blinking, it is unmodifiable, the reasons may be:

1) The function code is an unmodifiable parameter, such as the actual detection parameters, fault record parameters, operating record parameters etc.

2) The function code cannot be modified in the running state.

3.2.2 Fault reset

After the inverter has fault, the inverter will inform the relevant fault information. You can reset the inverter via the STOP/RESET key or the fault reset terminal (F6). The inverter will be in standby mode after fault reset. If the inverter is in a fault state and you do not reset it, the inverter cannot run and remains in the running protection state.

3.2.3 Motor parameter self-identification

To obtain good control performance, the motor must be self-identification of the parameters to obtain the exact parameters of the controlled motor; you must input correct motor parameters according to the name plate before identification, CT series inverters will match the parameters with the standard motor parameters.

The operation procedures for motor parameters identification are as follows:

First, select the keypad run command mode for the run command (F00.01).

Then enter the following parameters according to the actual motor parameters:

F01.02: Rated motor power;

F01.03: Rated motor frequency;

F01.04: Rated motor speed;

F01.05: Rated motor voltage;

F01.06: Rated motor current.

Note: The motor should be decoupled from the load. Otherwise, the identification parameters may be incorrect. Set F01.12 to 1, if the motor is not decoupled from the load, set F01.12 to 2 (see description of Function code F01.12 for detailed motor identification) and then press the RUN key, the inverter will automatically calculate the following parameters of the motor:

F01.07: Motor stator resistance;

F01.08: Motor rotor resistance;

F01.09: Motor stator and rotor inductance;

F01.10: Motor stator and rotor mutual inductance;

F01.11: Motor no-load current;

After the motor parameter identification is completed, the digital tube displays END, otherwise the self-identification failed.

3.2.4 Password setting

The inverters provide user password protection function. When F05.03 is set to non-zero, which is the user password. Exit the editing status of function code and password protection will take effect in 60s. Press the ESC key again to enter the editing status of function code and "8.8.8.8.8" will be displayed. You need to input correct user password, or cannot enter.

To disable the password protection function, set F05.03 to 0.

3.3 Display parameter

3.3.1 Running state

In the running state, the inverter has a total of 32 state parameters to be selected whether to display, including the running frequency, set frequency, bus voltage, output current, output voltage, running speed, linear speed, output power, output torque, input and output terminal status, PID reference, PID feedback, high speed pulse HDI frequency, count value, PLC and multi-step speed, torque setting, potentiometer value, AI1, AI2, motor overload percentage, inverter overload percentage etc. The parameters can be selected by F05.08 and F05.09 in binary bit. Press the 》 key to switch to the right to display the selected parameters, press the MF key to switch the left to display the selected parameters.

3.3.2 Standby state

In the stop, fault and running state, a variety of status parameters can be displayed. The parameter can be selected by F05.10 in binary bit.

In the stop state, the inverter has a total of 13 state parameters to be selected whether to display, including the set frequency, bus voltage, input and output terminal status, potentiometer value, AI1 , AI2, high speed pulse HDI frequency, PID reference, PID feedback, PLC or multi-step speed etc. The parameters can be selected by F05.10 in binary bit. Press the 》 key to switch the selected parameters in the right and press the MF key to switch the selected parameter in the left.

3.3.3 Fault state

In the fault state, both the fault state and the stop state will be displayed. Press the 》 key to switch to the right to display the selected parameters, press the MF key to switch the left to display the selected parameters.

Inverters provide a variety of fault information. Please refer to Chapter 7 fault reason and solution.

3.4 Keypad LED display meaning

Table 3-3 Displayed words

Displayed word	Meaning	Displayed word	Meaning	Displayed word	Meaning	Displayed word	Meaning
	0		1		2		3
	4		5		6		7
	8		9		A		b
	C		d		E		F
	H		I		L		N
	o		P		S		T
	U		V		.		

3.5 First time power on

Please carry out wiring in accordance with the technical requirements in Chapter 2. The flow time power on at the first time is as follows:

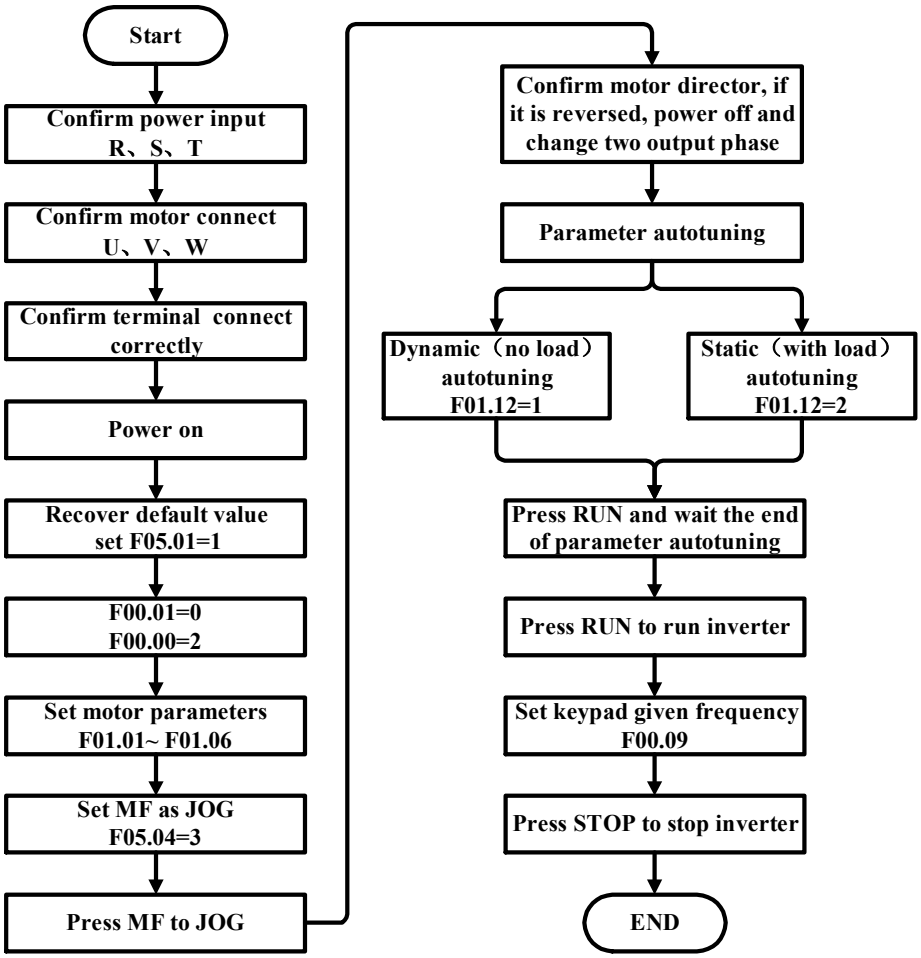


Figure 3-3 First power flow chart

CHAPTER 4 FUNCTION PARAMETER TABLE

CT100G&CT100E series inverters have some groups of function codes and factory group F15. The function codes have been divided into three levels. For example, “F08.08” means the eighth function code in the F8 function group. F15 group is factory group, and users are forbidden to access these parameters.

For the convenience of function codes setting, the function group number corresponds to the first level menu, the function code corresponds to the second level menu and the function code parameter corresponds to the third level menu.

1. Below are the instructions of the tables for function codes:

The first line “Function code”: codes of function parameter group and parameters

The second line “Name”: full name of function parameters

The third line “Detailed instruction of parameters”: Detailed illustration of the function parameters

The forth line “Default value”: the original factory set value of the function parameters

The fifth line “Modify”: the modifying character of function codes (the parameters can be modified or not and the modifying conditions), below are the instructions:

“○”: means the set value of the parameter can be modified in stop and running state;

“☆”: means the set value of the parameter cannot be modified in running state;

“●”: means the value of the parameter is the real detection value which cannot be modified.

(The inverter has limited the automatic inspection of the modifying character of the parameters to help users avoid modifying by mistake)

The sixth line “No.”: the serial number of the function parameters

2. “Parameter radix” is decimal (DEC), if the parameter is expressed by hex, then the parameter is separated from each other when editing. The setting range of certain bits are hex (0～F).

3. “Default value” means the function parameter will restore to the default value during default parameters restoring. But the detected parameter or recorded value will not be restored.

4. For a better parameter protection, the inverter provides password protection to the parameters and only factory and administrator can modify the function codes. After setting the user password (F05.03 is non-zero) and press the ESC key to enter into the parameter editing state, the system goes into user password verification and displays “0. 0. 0. 0. 0.”. You can enter only by inputting the correct user password. For the factory setting parameter zone, only factory can enter. (Remind that the users cannot modify the factory parameters by themselves; otherwise, if the parameter setting is incorrect, damage to the system may occur). If the password protection is unlocked, the user can modify the password freely and the user password will be subject to the last one. When F05.03=0, the user password is disabled.

5. When modifying the function parameters through 485 communication, the function of user password follows the above rules.

Table 4-1 Parameter table

Function code	Function	Detailed instruction of parameters	Default value	
F00 Group Basic function				
F00.00	Motor control mode	0:speed sensorless vector control 1:reserved 2:V/F control	2	☆
F00.01	Run command channel	0: keypad run command channel(LED off) 1: terminal running command channel(LED oflickering) 2: 485 run comm1: and channel (LED on)	0	○
F00.02	Main frequency source X	0:digital setting (pre-set frequency F00.09,UP/DOWN change, no power down memory) 1:digital setting (pre-set frequency F00.09,UP/DOWN change, with power down memory) 2:AI1 3:AI2 4:keypad potentiometer AI0 5:high speed pulse input (HDI) 6:multi-step speed 7:simple PLC 8:PID 9:485 communication	0	☆
F00.03	Auxiliary frequency source Y	Same as F00.02 main frequency	0	☆
F00.04	Reference object of Y frequency source	0: relative to the max frequency 1: relative to frequency source X	0	○
F00.05	Frequency source selection	Unit: frequency source selection 0: main 1: main and auxiliary operation (decided by ten) 2: main<--> auxiliary 3: main<-->main and auxiliary operation 4:auxiliary<-->main and auxiliary operation Ten: main and auxiliary operation relationship 0:main + auxiliary 1:main- auxiliary 2:max 3:min	00	○
F00.06	Max. frequency	50.00Hz～500.00Hz	50.00	☆
F00.07	Upper limit frequency	F00.08～F00.06(Max. frequency)	50.00	○
F00.08	Lower limit frequency	0.00Hz～F00.07(upper limit of running frequency)	0.00	○
F00.09	Frequency pre-setting	0.00Hz～F00.06(Max. frequency)	50.00	○
F00.10	Run direction	0: positive 1: reverse	0	○
F00.11	Carrier frequency	0.5kHz～16.0kHz	6.0	○
F00.12	Carrier frequency adjusted according to temperature	0:no 1:yes	1	○

Function code	Function	Detailed instruction of parameters	Default value	
F00.13	Motor selection	0:motor 1 1:motor 2	0	☆
F00.14	ACC time 1	0.00s～650.00s (F00.16=2) 0.0s～6500.0s (F00.16=1) 0s～65000s (F00.16=0)	20.0	○
F00.15	DEC time 1	0.00s～650.00s (F00.16=2) 0.0s～6500.0s (F00.16=1) 0s～65000s (F00.16=0)	20.0	○
F00.16	Unit of ACC/DEC time	0:1s 1:0.1s 2:0.01s	1	☆
F00.17	Auxiliary frequency source Y range	0%～150%	100	○
F00.18	Upper limit frequency source	0:F00.07set 1:AI1 2:AI2 3:reserve 4:high speed pulse input 5:485 communication	0	☆
F00.19	Upper limit frequency offset	0.00Hz～max frequencyF00.06	0.00	○
F00.20	Superimposed auxiliary frequency source offset	0.00Hz～max frequencyF00.06	0.00	○
F00.21	Decimal point of frequency instruction	1:0.1Hz 2:0.01Hz	2	☆
F00.22	Digital setting frequency memory selection	0: not save memory 1: save memory	0	○
F00.23	Basis frequency of ACC/DEC time	0:Max frequency(F00.06) 1:setting frequency 2:100Hz	0	☆
F00.24	Basis frequency of running frequencyUP/DOWN	0:running frequency 1:setting frequency	0	☆
F00.25	Command source binding frequency source	Unit: keypad command, binding frequency source selection 0: no binding 1: digital setting frequency 2:AI1 3:AI2 4:reserve 5:high speed pulse input(HDI) 6:multi-step speed 7:simple PLC 8:PID 9:485 communication Ten: Terminal command binding frequency source selection Hundreds:communication command binding frequency source selection	000	○
F00.26	Serial communication protocol selection	0:Modbus-RTU protocol 1:reserve	0	☆

Function code	Function	Detailed instruction of parameters	Default value	
F01 Group Motor 1 parameters				
F01.00	G/Ptype	0:G type 1:P type	0	☆
F01.01	Motor type	0: normal asynchronous motor 1: change frequency asynchronous motor	0	☆
F01.02	Rated power of asynchronous motor	Depend on model		☆
F01.03	Rated frequency of asynchronous motor	0.01Hz~ (Max. frequency)F00.06	50.00	☆
F01.04	Rated speed of asynchronous motor	1rpm～65535rpm	1460	☆
F01.05	Rated voltage of asynchronous motor	1V～2000V	380	☆
F01.06	Rated current of asynchronous motor	0.01A～655.35A	9.00	☆
F01.07	Stator resistance of asynchronous motor	0.001Ω～65.535Ω	1.204	☆
F01.08	Rotor resistance of asynchronous motor	0.001Ω～65.535Ω	0.908	☆
F01.09	Inductance of asynchronous motor	0.01mH～655.35mH	5.28	☆
F01.10	Mutual inductance of asynchronous motor	0.1mH～6553.5mH	158.6	☆
F01.11	Non-load current of asynchronous motor	0.01A～F01.03	4.24	☆
F01.12	Motor parameters auto-tuning	0: no actuation 1: dynamic auto-tuning (no load) 2: static auto-tuning 1 (with load) 3: static auto-tuning 2 (with load)	0	☆
F01.13	Encoder pulse quantity		1024	☆
F01.14	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver encoder 3: Sin-Cos encoder 4: Line-saving UVW encoder	0	☆
F01.15	Speed feedback PG selection	0:local PG 1:expand PG 2:HDI high speed pulse input	0	☆
F01.16	ABZ encoder AB phase sequence	0:positive 1:negative	0	☆
F01.17	encoder install position angle	0.0 ~ 359.9°	0.0	☆
F01.18	UVW signal phase sequence	0:positive 1:negative	0	☆
F01.19	UVW signal 0 position angle	0.0 ~ 359.9°	0.0	☆
F01.20	Resolver pole pair number	1~65535	1	☆
F01.21	reserve	reserve	0	☆
F01.22	speed feedback PG disconnection detection time	0.0 : no action 0.1s ~ 10.0s	0.0	☆

Function code	Function	Detailed instruction of parameters	Default value	
F01.23 ~F01.38	reserve	reserve	0	●
F02 Group Start and stop control				
F02.00	Start mode	0: start at the starting frequency 1: start after rotating speed tracking 2: Pre excitation	0	○
F02.01	Start delay time	0.0s～1000.0s	0.0	○
F02.02	Starting frequency	0.00Hz～10.00Hz	0.00	○
F02.03	Hold time of starting frequency	0.0s～100.0s	0.0	☆
F02.04	Start DC braking/Pre excitation current	0%～100%	0	☆
F02.05	Start DC braking/Pre excitation time	0.0s～100.0s	0.0	☆
F02.06	ACC and DEC mode	0: linear type 1: S curve A 2: S curve B	0	☆
F02.07	Terminal DI1 characteristic selection after power on	0: invalid 1:valid	0	☆
F02.08	Restart after power off	0: invalid 1:valid	0	☆
F02.09	Waiting time for restart	0.0s～100.0s	0.0	☆
F02.10	Stop mode	0: decelerate to stop 1: coast to stop	0	○
F02.11	Dead time of FWD/REV	0.0s～3000.0s	0.0	○
F02.12	Starting frequency before stop DC braking	0.00Hz～max frequency F00.06	0.00	○
F02.13	Waiting time before stop DC braking	0s～100.0s	0.0	○
F02.14	Stop DC braking current	0.0%～100%	0	○
F02.15	Stop DC braking time	0.0s～100.0s	0.0	○
F02.16	Braking use reate	0%～100%	100	○
F02.17	Delay time of dormancy	0.0～6500.0s	0.0	○
F02.18	Actuation when running frequency is less than lower limit frequency	0: run at lower limit frequency 1: stop 2: 0 speed run	0	○
F02.19	Delay time of dormancy wake up	0.0s～6500.0s	0.0	○
F02.20	Speed track mode	0:start from stop frequency 1:start from working frequency 2: start from max frequency	0	☆
F02.21	Quick or slow speed track	1～100	20	○
F02.22	Speed track KP	0～1000	500	○
F02.23	Speed track KI	0～1000	800	○
F02.24	Speed track current	30%～200%	100	☆
F02.25	Speed track low limit	10～100%	30	☆

Function code	Function	Detailed instruction of parameters	Default value	
F02.26	Speed track voltage rise time	5～30	11	☆
F02.27	Demagnetizing time	0.00～5.00s	1.00	☆
F02.28	S curve first phase time rate	0.0%~(100.0%-F06.29)	30.0	☆
F02.29	S curve final phase time rate	0.0%~(100.0%-F06.28)	30.0	☆
F03 Group V/F control				
F03.00	V/F curve	0: straight line V/F curve 1: multi-dots V/F curve 2: square V/F curve 3: 1.2th V/F curve 4: 1.4th V/F curve 6: 1.6th V/F curve 8: 1.8th V/F curve 10: VF total separate mode 11: VF half separate mode	0	☆
F03.01	Torque compensation	0.0%:automatic 0.1%～30.0% VF separate invalid	1.0	○
F03.02	Torque compensation cut-off frequency	0.00Hz~max frequency F00.06	50.00	☆
F03.03	V/F frequency 1	0.00Hz～F03.05	0.00	☆
F03.04	V/F voltage 1	0.0%～100.0%	0.0	☆
F03.05	V/F frequency 2	F03.03～F03.07	0.00	☆
F03.06	V/F voltage 2	0.0%～100.0%	0.0	☆
F03.07	V/F frequency 3	F03.05～motor rated voltage (F01.03)	0.00	☆
F03.08	V/F voltage 3	0.0%～100.0%	0.0	☆
F03.09	Slip compensation gain	0.0%～200.0%	0.0	○
F03.10	VF over excitation gain	0～200	64	○
F03.11	Oscillation suppression gain	0～100	0	○
F03.12	Oscillation suppression gain mode	0～4	3	☆
F03.13	VF separate voltage source	0:digital setting(F03.14) 1:AI1 2:AI2 3:reserve 4:HDI high speed pulse setting 5:multi-step 6:simple PLC 7:PID 8:communication setting 100.0% refer to motor rated voltage	0	○
F03.14	VF separate voltage source setting	0V～motor rated voltage F01.05	0	○
F03.15	VF separate voltage ACC time	0.0s～1000.0s It means time from 0v to motor rated voltage	0.0	○
F03.16	VF separate voltage DEC time	0.0s～1000.0s It means time from motor rated voltage to 0v	0.0	○
F03.17	VF separate stop model	0:frequency/voltage reduce to 0 separately	0	☆

Function code	Function	Detailed instruction of parameters	Default value	
		1:voltage reduce to 0, than frequency reduce		
F03.18	Current compensation coefficient of double speed over-current stall action	50～200%	130	☆
F03.19	over-current stall enable	0:invalid 1:valid	1	☆
F03.20	over-current stall Benefit	0～100	20	○
F03.21	Current compensation coefficient of double speed over-current stall action	50～200%	50	☆
F03.22	Overvoltage stall action voltage	200.0v～2000.0v set according to model 220V:380V 380V:760V	760.0	☆
F03.23	Overvoltage stall enable	0:invalid 1:valid	1	☆
F03.24	Overvoltage stall suppression frequency gain	0～100	30	○
F03.25	Overvoltage stall suppression voltage gain	0～100	30	○
F03.26	Overvoltage stall max frequency rise limit	0～50Hz	5	☆
F03.27	Slip compensation time constant	0.1～10.0s	0.5	○
F03.28	Automatic increase frequency enable	0: invalid 1: valid	0	☆
F03.29	Min electric torque current	10%～100%	50	☆
F03.30	Max power torque current	10%～100%	20	☆
F03.31	Automatic increase frequency KP	0～100	50	☆
F03.32	Automatic increase frequency KI	0～100	50	☆
F03.33	On line torque compensation gain	80%～150%	100	☆
F04 Group Motor 1 Vector control				
F04.00	Speed loop proportional gain 1	1～100	30	○
F04.01	Integral time of speed loop 1	0.01s～10.00s	0.50	○
F04.02	Switch frequency1	0.00～F04.05	5.00	○
F04.03	Speed loop proportional gain 2	1～100	20	○
F04.04	Integral time of speed loop 2	0.01s～10.00s	1.00	○
F04.05	Switch frequency2	F04.02~max frequency F00.06	10.00	○
F04.06	Slip gain of vector control	50%～200%	100	○
F04.07	SVC Speed feedback filtering time	0.000s～1.000s	0.050	○
F04.08	Overexcitation gain of vector control	0～200	64	○
F04.09	Speed control (drive) torque	0.0%～200.0%	150.0	○

Function code	Function	Detailed instruction of parameters	Default value	
	max limit digital setting			
F04.10	Speed control(drive) torque max limit source	0:F04.09 set 1:AI1 2:AI2 3:reserve 4:HDI high speed pulse setting 5:communication setting 6:min (AI1,AI2) 7:MAX (AI1,AI2) 1-7 Full scale corresponding to F04.09	0	○
F04.11	Speed control(braking) torque max limit source	0:F04.12 set 1:AI1 2:AI2 3:reserve 4:HDI high speed pulse setting 5:communication setting 6:min (AI1,AI2) 7:MAX (AI1,AI2) 1-7 Full scale corresponding toF04.12	0	○
F04.12	Speed control(braking) torque max limit digital setting	0.0%～200.0%	150.0	○
F04.13	Proportional gain of excitation regulation	0～60000	2000	○
F04.14	Integral gain of excitation regulation	0～60000	1300	○
F04.15	Proportional gain of torque regulation	0～60000	2000	○
F04.16	Integral gain of torque regulation	0～60000	1300	○
F04.17	Integral attribute of speed loop	Unit place:integral separation 0: Integral always valid 1: speed loop integral separation	0	○
F04.18	Vector control mode weak magnetic mode selection	0:no weak magnetic 1:direct calculate 2:Automatic adjust	0	○
F04.19	Over modulation enable selection	0:disable 1:enable	0	○
F04.20	Maximum output voltage coefficient	100%～110%	105	☆
F04.21	Maximum torque coefficient in weak magnetic region	50%～200%	100	○
F04.22	Selection of generation (braking) torque enabling under speed model	0:disable 1:enable	0	○
F05 Group Keypad and display				
F05.00	reserve	0～65535	0	●
F05.01	Parameter initialization	0: no actuation 01: recover default value, not include motor parameters	0	☆

Function code	Function	Detailed instruction of parameters	Default value	
		02: clear fault records 04:backup user parameters 501: recover user parameters		
F05.02	reserved	0～65535	0	●
F05.03	User password	0～65535	0	○
F05.04	Functions of MF key	0: MF disable 1:switch between keypad command and remote command 2:FWD/REV switch 3:FWD jog 4:REV jog	0	☆
F05.05	Stop function of STOP/RERST key	0: only valid for keypad control 1: valid for all control modes	1	○
F05.06	Rotating speed display correction	0.0001～6.5000	1.0000	○
F05.07	Linear speed display correction	0.0001～6.5000	1.0000	○
F05.08	Displayed parameters 1 when running	0000～FFFF BIT00: running frequency (Hz) BIT01: set frequency (Hz) BIT02: bus voltage (V on) BIT03: output voltage (V) BIT04: output current (A) BIT05: output power(kW) BIT06: output torque(%) BIT07: DI output state BIT08: DO output state BIT09: AI1 voltage (v) BIT10: AI2 voltage (v) BIT11: reserve BIT12: Count value BIT13: Length value BIT14: load speed display BIT15: PID set	0x001F	○
F05.09	Displayed parameters 2 when running	0000～FFFF BIT00: PID feedback BIT01: PLC stage BIT02: high speed pulse input pulse frequency (kHz) BIT03: running frequency 2(Hz) BIT04:Remaining run time BIT05: AI1 voltage before correction BIT06: AI2 voltage before correction BIT07: reserve BIT08: linear speed BIT09: current power on time BIT10: current running time BIT11: high speed pulse input pulse frequency, unit:1Hz BIT12: communication set	0x0000	○

Function code	Function	Detailed instruction of parameters	Default value	
		BIT13: encoder feedback speed BIT14: main frequency X display BIT15: auxiliary frequency Y display		
F05.10	LED display at stop	0000～FFFF BIT00: set frequency (Hz) BIT01: bus voltage (v) BIT02: DI input state BIT03: DO output state BIT04: AI1 voltage (v) BIT05: AI2 voltage (v) BIT06: reserve BIT07: Count value BIT08: Length value BIT09: PLC stage BIT10: load speed BIT11: PID set BIT12: high speed pulse input pulse frequency (kHz)	0x0033	○
F05.11	Software version 1	v0.0x	0.00	●
F05.12	Software version 2	v0.0x	0.00	●
F05.13	Product name	Depend on product	0	●
F05.14	Inverter module radiator temperature	0.0℃～100.0℃	0	●
F05.15	Cumulative running time	0h～65535h	0	●
F05.16	Load speed display decimal places	Unit place:B00.14 decimal places 0:0 1:1 2:2 3:3 Ten place:B00.19/B00.29 decimal places 1:1 2:2	21	○
F05.17	Cumulative power on time	0h～65535h	0	●
F05.18	Cumulative power consumption	0～65535°	0	●
F06 Group Input terminals				
F06.00	Functions of DI1 terminal	0: invalid 1: forward running 2: reverse running 3: Three line operation control 4: forward jogging 5: reverse jogging 6: terminal UP 7: terminal DOWN 8: coast to stop 9: fault reset 10: run pause 11: external fault constant open input 12: multi-step speed terminal 1	1	☆
F06.01	Functions of DI2 terminal		4	☆
F06.02	Functions of DI3 terminal		9	☆
F06.03	Functions of DI4 terminal		12	☆
F06.04	reserve		13	☆
F06.05	reserve		0	☆
F06.06	reserve		0	☆
F06.07	HDI terminal function		0	☆
F06.08	reserved		0	☆

Function code	Function	Detailed instruction of parameters	Default value	
		13: multi-step speed terminal 2 14: multi-step speed terminal 3 15: multi-step speed terminal 4 16: ACC/DEC selection 1 17: ACC/DEC selection 2 18: frequency source switch 19: UP/DOWN setting clear(terminal, keypad) 20: running command switch 21: ACC/DEC forbid 22: PID pause 23: PLC reset 24: wobble pause 25: counter input 26: counter reset 27: length count input 28: length reset 29: torque control forbid 30: high speed pulse(pulse) frequency input 31:reserved 32:Immediate DC braking 33:external fault constant open input 34: frequency set being valid terminal (if terminal set as this function. The terminal will be used to control what time the frequency change setting start to work) 35:negative PID direction 36: external stop terminal 1 (under keypad control mode, use this terminal to stop as the STOP key on keypad) 37: control command switch terminals 2 (switch between terminal control and communication control) 38:PID integral pause 39:X setting and pre-setting switch 40:Y setting and pre-setting switch 41: motor selection terminal 1 42: reserve 43: PID parameter switch terminal 44: user define fault 1 45: user define fault 2 46: speed control/ torque control switch 47: emergency stop 48: external stop terminal 2(under any control mode, this terminal can be used to stop as DEC time 4) 49: DEC DC braking 50: this running time to 0 51: two/three wire mode switch 52: forbid REV 53～59:reserved		
F06.09	reserve		0	☆

Function code	Function	Detailed instruction of parameters	Default value	
F06.10	DI filter time	0.000s～1.000s	0.010	○
F06.11	Terminal control running mode	0: two-wire control mode 1 1: two-wire control mode 2 2: three-wire control mode 1 3: three-wire control mode 2	0	☆
F06.12	Terminal UP/DOWN change rate every s	0.001Hz/s～65.535Hz/s	1.000	○
F06.13	Curve 1 minimum input	0.00V～F06.15	0.00	○
F06.14	Curve 1 minimum input corresponding setting	-100.0%～100.0%	0.0	○
F06.15	Curve 1 maximum input	F06.13～10.00V	10.00	○
F06.16	Curve 1 maximum input corresponding setting	-100.0%～100.0%	100.0	○
F06.17	AI1 filter time	0.00s～10.00s	0.10	○
F06.18	Curve 2 minimum input	0.00V～F06.20	0.00	○
F06.19	Curve2 minimum input corresponding setting	-100.0%～100.0%	0.0	○
F06.20	Curve 2 maximum input	F06.18～10.00V	10.00	○
F06.21	Curve 2 maximum input corresponding setting	-100.0%～100.0%	100.0	○
F06.22	AI2 filter time	0.00s～10.00s	0.10	○
F06.23	Curve 3 minimum input	-10,00V～F06.25	-10.00	○
F06.24	Curve 3 minimum input corresponding setting	-100.0%～100.0%	-100.0	○
F06.25	Curve 3 maximum input	F06.23～10.00V	10.00	○
F06.26	Curve 3 maximum input corresponding setting	-100.0%～100.0%	100.0	○
F06.27	reserve	0.00s～10.00s	0.10	○
F06.28	PULSE minimum input	0.00kHz～F06.30	0.00	○
F06.29	PULSE minimum input corresponding setting	-100.0%～100.0%	0.0	○
F06.30	PULSE maximum input	F06.28～100.00kHz	50.00	○
F06.31	PULSE maximum input setting	-100.0%～100.0%	100.0	○
F06.32	PULSE filter time	0.00s～10.00s	0.10	○
F06.33	AI setting curve selection	Unit place:AI1curve selection 1:curve1 (2point, referF06.13～F06.16) 2:curve2 (2point, referF06.18～F06.21) 3:curve3 (2point, referF06.23～F06.26) 4:Curve 4 (4point, referA06.00～A06.07) 5:Curve 5 (4point, referA06.08～A06.15) Ten place:AI2curveselection,same as AI1 Hundred place: reserve	321	○
F06.34	AI lower than minimum input setting selection	Unit place:AI1 lower than minimum input setting selection 0: set minimum input correspondingly 1:0.0%	000	○

Function code	Function	Detailed instruction of parameters	Default value	
		Ten place:AI2 lower than minimum input setting selection,same as AI1 Hundred place:reserve		
F06.35	DI1delay time	0.0s～3600.0s	0	○
F06.36	DI2delay time	0.0s～3600.0s	0	○
F06.37	DI3delay time	0.0s～3600.0s	0	○
F06.38	DI1-DI4input terminal valid selection	0:high level 1:low level Unit place:DI1 Ten place:DI2 hundred place:DI3 Thousand place:DI4 Ten thousand place:reserve	00000	☆
F06.39	reserve	reserve	00000	☆
F07 Group Output terminals				
F07.00	HDO output mode	0:pulse output 1:switch output	0	○
F07.01	HDO switch output selection	0: no output	0	○
F07.02	Relay T1 output selection	1: running	2	○
F07.03	Relay T2 output selection	2: fault output	0	○
F07.04	D0 output selection	3: frequency level detection FDT1 output 4: frequency arrival 5: zero speed running 1(no output at stop) 6: motor over load pre-alarm 7: inverter over load pre-alarm 8: set count value arrival 9: specified count value arrival 10: length arrival 11: simple PLC cycle is completed 12: running time arrival 13: frequency is limited 14: torque is limited 15: ready to run 16: AI1>AI2 17: upper limit frequency arrival 18: lower limit frequency arrival(related to running) 19: under voltage state output 20: communication set 21: location finished(reserved) 22: location approach(reserved) 23: zero speed running 2 (output at stop) 24: power on time arrive 25: frequency level detection FDT2 output 26: frequency arrive 1 output 27: frequency arrive 2 output 28: current arrive 1 output 29: current arrive 2 output 30: time arrive output 31: AI1 input out of limit	1	○

Function code	Function	Detailed instruction of parameters	Default value	
		32: loss load 33: REV running 34: 0 current state 35: module temperature arrive 36: output current over limit 37: lower frequency arrive (not related to running) 38: fault output (all faults) 39: motor over heat pre-alarm 40: current running time arrive 41: fault output(free stop faults and not output under voltage		
F07.05	reserve	reserve	4	○
F07.06	HDO pulse output selection	0: running frequency 1: set frequency 2: output current 3: output torque 4: output power 5: output voltage 6: high speed pulse output(100.0% corresponding to 100.0kHz) 7: AI1 8: AI2 9: reserve 10: length 11: count value 12: communication set 13: motor speed 14: output current(100.0% corresponding to 1000.0A) 15: output voltage(100.0% corresponding to 1000.0V) 16: motor output torque(true value, percentage of rated current relative to motor) 17: inverter output torque(true value, percentage of rated current relative to inverter)	0	○
F07.07	AO1 output selection		0	○
F07.08	AO2 output selection		1	○
F07.09	HDO pulse output max frequency	0.01kHz～100.00kHz	50.00	○
F07.10	AO1 bias coefficient	-100.0%～100.0%	0.0	○
F07.11	AO1 gain	-10.00～10.00	1.00	○
F07.12	AO2 bias coefficient	-100.0%～100.0%	0.0	○
F07.13	AO2 gain	-10.00～10.00	1.00	○
F07.14	HDO switch output delay time	0.0s～3600.0s	0.0	○
F07.15	Relay 1 output delay time	0.0s～3600.0s	0.0	○
F07.16	Relay 2 output delay time	0.0s～3600.0s	0.0	○
F07.17	DO output delay time	0.0s～3600.0s	0.0	○
F07.18	reserve	reserve		
F07.19	DO output terminal valid state selection	0-positive logic 1:negative logic	00000	○

Function code	Function	Detailed instruction of parameters	Default value	
		unit place:HDO ten place: relay 1 hundred place: relay 2 thousand place:DO ten thousand place:reserve		
F08 Group Fault and protection				
F08.00	Motor overload protection selection	0: disabled 1: enabled	1	○
F08.01	Motor overload protection gain	0.20～10.00	1.00	○
F08.02	Motor overload pre-alarm coefficient	50%～100%	80	○
F08.03	Motor overload pre-alarm detection time	0.20s～10.00s	1.00	○
F08.04	Motor overload pre-alarm act selection	0: no detection 1: overload warning is valid in running, continue to run 2: overload warning is valid in running, alarm (OL3) and stop 3: overload warning is valid in constant speed running, continue to run after detection 4: overload warning is valid in constant speed running, alarm(OL3) and stop after detection	1	○
F08.05	Over-voltage stall gain	0～100	0	○
F08.06	Over-voltage stall protection voltage	200.0～2000.0v set according to different models 220V:380V 380V:760V	760.0	☆
F08.07	Over-current stall gain	0～100	20	○
F08.08	Over-current stall protection current	100%～200%	150	☆
F08.09	Instant stop not stop gain Kp	0～100	40	○
F08.10	Instant stop not stop Integral coefficient Ki	0～100	30	○
F08.11	Instant stop not stop act DEC time	0.0～300.0s	20.0	☆
F08.12	Input phase loss / contactor protection	Unit place: input phase loss protection selection Ten place: contactor protection selection 0: disabled 1: enabled	01	○
F08.13	Output phase loss protection selection	0: disabled 1: enabled	1	○
F08.14	Automatic reset times	0～20	0	○
F08.15	Automatic reset interval	0.1s～100.0s	1.0	○
F08.16	First fault type	0: no fault 1: inverter unit U phase protection(E.oUt1) 2: inverter unit V phase protection(E.oUt2) 3 :inverter unit W phase protection(E.oUt3) 4: ACC over current(E.oC1)	0	●

Function code	Function	Detailed instruction of parameters	Default value	
		5: DEC over current(E.oC2) 6: constant speed over current(E.oC3) 7: ACC over voltage (E.oU1) 8: DEC over voltage (E.oU2) 9: constant speed over voltage(E.oU3) 10: bus under voltage fault(E.Lv) 11: motor overload(E.oL1) 12: inverter overload(E.oL2) 13: input side phase loss(E.ILF) 14: output side phase loss(E.oLF) 15: rectifier radiator overheating(E.oH1) 16: inverter radiator overheating(E.oH2) 17: external fault(E.EF) 18: communication failure(E.485) 19: current detection fault(E.ItE) 20: motor parameter learning fault(E.AUt) 21:EEFROM operation fault(E.EEP) 22: PID disconnection fault(E.PIDE) 23: braking unit fault(E.bC) 24: run time arrival (E.ENd) 25: electric overload(E.oL3) 26: keypad communication fault(E.FCE) 27: parameter upload fault(E.UFE) 28: parameter download fault(E.dNE) 29: reserve 30: reserve 31: reserve 32: earth fault 1(E.EAH1) 33: earth fault 2(E.EAH2) 34: speed bias fault(E.dEU) 35: mis-adjust fault(E.Sto) 36: under load fault(E.LL) 37: reserved 38: Buffer resistance overload fault(E.BoL) 39: contactor fault(E.CEr) 40: quick limit third fault(E.CBC) 41: switch motor while running(E.CrP) 42: user define fault 1(E.uD1) 43: user difin fault 2(E.uD2) 44: power on time arrive(E.PTo)		
F08.17	Second fault type		0	●
F08.18	Third fault type(latest fault)		0	●
F08.19	Frequency at third fault		0.00	●
F08.20	Current at third fault		0.00	●
F08.21	Bus voltage at third fault		0.0	●
F08.22	Input terminal status at third fault		0	●
F08.23	Output terminal status at third fault		0	●
F08.24	Inverter status at third fault		0	●

Function code	Function	Detailed instruction of parameters	Default value	
F08.25	Third fault time(count from latest power on)		0	●
F08.26	Third fault time(count from latest start running)		0.0	●
F08.27	Frequency at second fault		0.00	●
F08.28	Current at second fault		0.00	●
F08.29	Bus voltage at second fault		0.0	●
F08.30	Input terminal status at second fault		0	●
F08.31	Output terminal status at second fault		0	●
F08.32	Inverter status at second fault		0	●
F08.33	Second fault time(count from latest power on)		0	●
F08.34	Second fault time(count from latest start running)		0.0	●
F08.35	Frequency at first fault		0.00	●
F08.36	Current at first fault		0.00	●
F08.37	Bus voltage at first fault		0.0	●
F08.38	Input terminal status at first fault		0	●
F08.39	Output terminal status at first fault		0	●
F08.40	Inverter status at first fault		0	●
F08.41	First fault time(count from latest power on)		0	●
F08.42	First fault time(count from latest start running)		0.0	●
F08.43	Power one earth protection selection	0:disable 1:enable	1	○
F08.44	Braking start voltage	200.0～2000.0v set according different models 220V:360V 380V:690V	690.0	○
F08.45	DO act selection while fault automatic reset period	0:not act 1:act	0	○
F08.46	Fault protection act selection 1	Unit place: motor over load(E.oL1) 0:free stop 1:stop as stop mode 2:continue running Ten place: input phase loss(E.ILF) hundred place: output phase loss(E.oLF) Thousand: external fault(E.EF) Ten thousand: communication failure(E.485)	00000	○
F08.47	Fault protection act selection 2	Unit place: encoder fault(E.PGL) 0:free stop Ten place:reserve 0:free stop 1:stop as stop mode Ten place:reserve	00000	○

Function code	Function	Detailed instruction of parameters	Default value	
		Thousand place:reserve Ten thousand place:running time arrive(E.ENd)		
F08.48	Fault protection act selection 3	Unit place: user define fault 1(E.uD1) 0:free stop 1:stop as stop mode 2:continue running Ten place: user define fault 2(E.uD2) 0:free stop 1:stop as stop mode 2:continue running ten place:power on time arrive(E.PTo) 0:free stop 1:stop as stop mode 2:continue running Thousand place:reserved 0:free stop 1:DEC stop 2: DEC to 7% of motor rated frequency and run. Automatic back to set frequency if not loss load Ten thousand place: PID feedback disconnect fault(E.PIdE) 0:free stop 1:stop as stop mode 2:continue running	00000	○
F08.49	Fault protection act selection 4	Unit place:too big speed bias(E.dEU) 0:free stop 1:stop as stop mode 2:continue running ten place:reserve hundred place:reserve	000	○
F08.50	reserve			
F08.51	Continue running (while fault) frequency selection	0:running as current frequency 1:running as set frequency 2:running as upper limit frequency 3:running as lower limit 4:running as abnormal standby frequency	0	○
F08.52	Abnormal standby frequency setting	0.0%～100.0% (current aim frequency)	100	○
F08.53	Motor temperature sensor types	0:no temperature sensor 1:PT100 2:PT1000	0	○
F08.54	Motor over heat protection value	0℃～200℃	110	○
F08.55	Motor over heat pre alarm value	0℃～200℃	90	○
F08.56	Instant stop not stop act selection	0:disbale 1:DEC 2:DEC to stop	1	☆
F08.57	Judging voltage for suspended stop instant stop act	80.0%～100.0%	85.0	☆

Function code	Function	Detailed instruction of parameters	Default value	
F08.58	Judging time for instant stop not stop voltage rise	0.0s～100.0s	0.5	☆
F08.59	Judging voltage for instant stop not stop act	60.0%～100.0% (standard bus voltage)	80.0	○
F08.60	Loss load protection selection	0:disable 1:enable	0	○
F08.61	Detection lever for loss load	0.0～100.0%	10.0	○
F08.62	Detection time for loss load	0.0～60.0s	1.0	○
F08.63	reserved	0～65536	0	●
F08.64	Over speed detection value	0.0%～50.0% (max frequency)	20.0	○
F08.65	Over speed detection time	0.0s: no detection 0.1～60.0s	1.0	○
F08.66	Detection value for too big speed bias	0.0%～50.0% (max frequency)	20.0	○
F08.67	Detection time for too big speed bias	0.0s: no detection 0.1～60.0s	5.0	○
F09 Group PID function				
F09.00	PID reference channel	0: F09.01 set 1: AI1 2: AI2 3: reserve 4: High speed pulse set 5: communication set 6: multi step speed set 7.pressure set	0	○
F09.01	PID digital give	0.0%～100.0%	50.0	○
F09.02	PID feedback channel	0: AI1 1: AI2 2: reserve 3: AI1-AI2 4: high speed pulse 5: communication 6: AI1+AI2 7: MAX (|AI1|,|AI2|) 8: min (|AI1|,|AI2|)	0	○
F09.03	PID direction	0: positive 1: negative	0	○
F09.04	PID feedback range	0～65535	1000	○
F09.05	PID REV stop frequency	0.00Hz～max frequency F00.06	0.00	○
F09.06	Proportional gain P1	0.0～100.0	20.0	○
F09.07	Integral time I1	0.01s～10.00s	0.20	○
F09.08	Differential time D1	0.000s～10.000s	0.000	○
F09.09	reserved	0～65535	0	●
F09.10	PID control deviation limit	0.0%～100.0%	0.0	○
F09.11	Feedback loss detection value	0.0%: not judge feedback loss 0.1%～100.0%	0.0	○
F09.12	Feedback loss detection time	0.0s～20.0s	0.0	○

Function code	Function	Detailed instruction of parameters	Default value	
F09.13	PID Differential limit	0.00%～100.00%	0.10	○
F09.14	PIDgive change time	0.00～650.00s	0.00	○
F09.15	PID feedback filter time	0.00～60.00s	0.00	○
F09.16	PID output filter time	0.00～60.00s	0.00	○
F09.17	Proportional gain P2	0.0～100.0	20.0	○
F09.18	Integral time I2	0.01s～10.00s	2.00	○
F09.19	Differential time D2	0.000s～10.000s	0.000	○
F09.20	PID parameter change term	0: not change 1: DI terminal 2: Automatic change according to bias 3: Automatic change running frequency	0	○
F09.21	PID parameter change bias 1	0.0%～F10.22	20.0	○
F09.22	PID parameter change bias 2	F10.21～100.0%	80.0	○
F09.23	PID initial value	0.0%～100.0%	0.0	○
F09.24	PID initial value keep time	0.00～650.00	0.00	○
F09.25	FWD max bias of two output	0.00～100.00%	1.00	○
F09.26	REV max bias of two output	0.00%～100.00%	1.00	○
F09.27	PID Integral attribute	Unit place: integral attribute 0: disable 1: enable Ten place: output arrive limit, stop integral or not 0: not stop 1:stop	00	○
F09.28	PID stop calculation	0: disable at stop 1: calculate at stop	0	○
F10 Group Wobble, step length and count value				
F10.00	Wobble set mode	0:Corresponding to centre frequency 1:Corresponding to maximum frequency	0	○
F10.01	Wobble range	0.0%～100.0%	0.0	○
F10.02	Saltation frequency amplitude	0.0%～50.0%	0.0	○
F10.03	Wobble cycle	0.1s～3000.0s	10.0	○
F10.04	Wobble triangular wave rise time	0.1%～100.0%	50.0	○
F10.05	Set length	0m～65535m	1000	○
F10.06	Actual length	0m～65535m	0	○
F10.07	Pulse per meter,unit:0.1	0.1～6553.5	100.0	○
F10.08	Set count value	1～65535	1000	○
F10.09	Designated count value	1～65535	1000	○
F11 Group Multi-step speed and PLC				
F11.00	Multi-step speed command 0	-100.0%～100.0% (100.0% corresponding to maximum frquencyF00.06)	0	○
F11.01	Multi-step speed command 1	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.02	Multi-step speed command 2	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○

Function code	Function	Detailed instruction of parameters	Default value	
F11.03	Multi-step speed command 3	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.04	Multi-step speed command 4	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.05	Multi-step speed command 5	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.06	Multi-step speed command 6	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.07	Multi-step speed command 7	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.08	Multi-step speed command 8	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.09	Multi-step speed command 9	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.10	Multi-step speed command 10	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.11	Multi-step speed command 11	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.12	Multi-step speed command 12	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.13	Multi-step speed command 13	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.14	Multi-step speed command 14	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.15	Multi-step speed command 15	-100.0%～100.0% (100.0% of max frequency F00.06)	0	○
F11.16	PLC work mode	0: stop after a single run 1: run at the final value after a single run 2: circulate to run	0	○
F11.17	PLC power failure memory	Unit place: 0:no power failure memory 1:with power failure memory Ten place: 0:no inverter stop memory 1:with inverter stop memory	0	○
F11.18	Step 0 running time	0.0s (h)～6553.5s (h)	0	○
F11.19	PLC step 0 ACC/DEC time selection	0～3	0	○
F11.20	Step 1 running time	0.0s (h)～6553.5s (h)	0	○
F11.21	PLC step 1 ACC/DEC time selection	0～3	0	○
F11.22	Step 2 running time	0.0s (h)～6553.5s (h)	0	○
F11.23	PLC step 2 ACC/DEC time selection	0～3	0	○
F11.24	Step 3 running time	0.0s (h)～6553.5s (h)	0	○
F11.25	PLC step 3 ACC/DEC time selection	0～3	0	○

Function code	Function	Detailed instruction of parameters	Default value	
F11.26	Step 4 running time	0.0s (h)～6553.5s (h)	0	○
F11.27	PLC step 4 ACC/DEC time selection	0～3	0	○
F11.28	Step 5 running time	0.0s (h)～6553.5s (h)	0	○
F11.29	PLC step 5 ACC/DEC time selection	0～3	0	○
F11.30	Step 6 running time	0.0s (h)～6553.5s (h)	0	○
F11.31	PLC step 6 ACC/DEC time selection	0～3	0	○
F11.32	Step 7 running time	0.0s (h)～6553.5s (h)	0	○
F11.33	PLC step 7 ACC/DEC time selection	0～3	0	○
F11.34	Step 8 running time	0.0s (h)～6553.5s (h)	0	○
F11.35	PLC step 8 ACC/DEC time selection	0～3	0	○
F11.36	Step 9 running time	0.0s (h)～6553.5s (h)	0	○
F11.37	PLC step 9 ACC/DEC time selection	0～3	0	○
F11.38	Step 10 running time	0.0s (h)～6553.5s (h)	0	○
F11.39	PLC step 10 ACC/DEC time selection	0～3	0	○
F11.40	Step 11 running time	0.0s (h)～6553.5s (h)	0	○
F11.41	PLC step 11 ACC/DEC time selection	0～3	0	○
F11.42	Step 12 running time	0.0s (h)～6553.5s (h)	0	○
F11.43	PLC step 12 ACC/DEC time selection	0～3	0	○
F11.44	Step 13 running time	0.0s (h)～6553.5s (h)	0	○
F11.45	PLC step 13 ACC/DEC time selection	0～3	0	○
F11.46	Step 14 running time	0.0s (h)～6553.5s (h)	0	○
F11.47	PLC step 14 ACC/DEC time selection	0～3	0	○
F11.48	Step 15 running time	0.0s (h)～6553.5s (h)	0	○
F11.49	PLC step 15 ACC/DEC time selection	0～3	0	○
F11.50	PLC running time unit	0:s 1:h	0	○
F11.51	Multi-step 0 give command mode	0:F11.00 1:AI1 2:AI2 3:reserve 4:high speed pulse 5:PID 6:F00.09 gived, UP/DOWN can be modified	0	○
F12 Group 485 communication				
F12.00	Local address	1～247, 0 broadcast address	1	○

Function code	Function	Detailed instruction of parameters	Default value	
F12.01	Baud rate	Unit place:MODBUS 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS Ten place:reserved Hundred place:reserved Thousand place:reserved	5006	○
F12.02	Data check	0: no check (8-N-2) 1:even check(8-E-1) 2:odd check(8-O-1) 3:8-N-1	1	○
F12.03	Response delay	0ms～20ms	2	○
F12.04	Communication timeout detection time	0.0(disable),0.1s～60.0s	0.0	○
F12.05	Data transfer format selection	Unit position: MODBUS-RTU protocol 0:not standard MODBUS-RTU protocol 1:standard MODBUS-RTU protocol Ten position:reserved	31	○
F12.06	Communication read current resolution	0:0.01A 1:0.1A	0	○
F12.07	reserve			
F13 Group Auxiliary function				
F13.00	Jogging frequency	0.00Hz～max frequencyF00.06	2.00	○
F13.01	Jogging running ACC time	0.0s～6500.0s	20.0	○
F13.02	Jogging running DEC time	0.0s～6500.0s	20.0	○
F13.03	ACC time 2	0.0s～6500.0s	20.0	○
F13.04	DEC time 2	0.0s～6500.0s	20.0	○
F13.05	ACC time 3	0.0s～6500.0s	20.0	○
F13.06	DEC time 3	0.0s～6500.0s	20.0	○
F13.07	ACC time 4	0.0s～6500.0s	20.0	○
F13.08	DEC time 4	0.0s～6500.0s	20.0	○
F13.09	Jump frequency 1	0.00Hz～Max. Frequency F00.06	0.00	○
F13.10	Jump frequency 2	0.00Hz～Max. Frequency F00.06	0.00	○
F13.11	Jump frequency range	0.00Hz～Max. Frequency F00.06	0.00	○
F13.12	REV control	0:permit REV 1: forbid REV	0	○
F13.13	Droop control	Slip when the torque current is equal to the rated current of the motor 0.00Hz～10.00Hz	0.00	○
F13.14	Set power on arrive time	0h～65535h	0	○
F13.15	Set running arrive time	0h～65535h	0	○

Function code	Function	Detailed instruction of parameters	Default value	
F13.16	Protection selection	0:not protect 1:protect	0	○
F13.17	Frequency detection value (FDT1)	0.00Hz～max frequency F00.06	50.00	○
F13.18	Frequency detection delay value (FDT1)	0.0%～100.0%(FDT1 level)	5.0	○
F13.19	Frequency arrival detection amplitude	0.0～100.0%(Max. frequency)	0.0	○
F13.20	Jump frequency valid or not while ACC/DEC	0: invalid 1: valid	0	○
F13.21	Running time arrive action	0: keep running 1: alarm fault	0	○
F13.22	Power on time arrive action	0: keep running 1: alarm fault	0	○
F13.23	Switch frequency of ACC time 1/2	0.00Hz～Max. Frequency F00.06	0.00	○
F13.24	Switch frequency of DEC time 1/2	0.00Hz～Max. Frequency F00.06	0.00	○
F13.25	Terminal JOG priority	0: invalid 1: valid	0	○
F13.26	Frequency detection value(FDT2)	0.00Hz～Max. Frequency F00.06	50.00	○
F13.27	Frequency detection delay value (FDT2)	0.0%～100.0%(FDT2 level)	5.0	○
F13.28	Any arrival detection frequency value 1	0.00Hz～Max frequency F00.06	50.00	○
F13.29	Frequency arrival detection amplitude1	0.0%～100.0%(Max frequency)	0.0	○
F13.30	Any arrival detection frequency value 2	0.00Hz～Max frequency F00.06	50.00	○
F13.31	Any arrival detection frequency range 2	0.0%～100.0% (Max frequency)	0.0	○
F13.32	0 current detection level	0.0%～300.0% 100.0% corresponding motor rated current, no output at stop.	5.0	○
F13.33	0 current detection delay time	0.01s～600.00s	0.10	○
F13.34	Output current over limit	0.0% (no detection) 0.1%～300.0% (motor rated current)	200.0	○
F13.35	Output current over limit detection delay time	0.00s～600.00s	0.00	○
F13.36	Any arrival current 1	0.0%～300.0% (motor rated current)	100.0	○
F13.37	Any arrival current 1range	0.0%～300.0% (motor rated current)	0.0	○
F13.38	Any arrival current 2	0.0%～300.0% (motor rated current)	100.0	○
F13.39	Any arrival current 2 range	0.0%～300.0% (motor rated current)	0.0	○
F13.40	Timing function selection	0:invalid 1:valid	0	☆
F13.41	Timer running time selection	0: F13.42 setting 1: AI1	0	☆

Function code	Function	Detailed instruction of parameters	Default value	
		2: AI2 3: reserved Analog input range corresponding to F13.42		
F13.42	Timer running time	0.0min～6500.0min	0.0	☆
F13.43	AI1input voltage protection value high limit	0.00V～F13.44	3.10	○
F13.44	AI1input voltage protection value low limit	F13.43～11.00V	6.80	○
F13.45	Module temperature arrive	0℃～100℃	75	○
F13.46	Radiate fan control	0: fan runs while inverter running 1: fan always run	0	○
F13.47	Wake up frequency	Sleep frequency (F13.48)～Max frequency (F00.06)	0.00	○
F13.48	Sleep frequency	0.00Hz～Wake up frequency(F13.47)	0.00	○
F13.49	Current running arrive time	0.0s～6500.0Mins	0.0	○
F13.50	Output power correction factor	0.0～200.0%	100.0	○
F14 Group User define functions				
F15 Group Factory parameters				
F16 Group User parameters				
F16.00	Display of function parameters	Unit place: B00 parameter group display selection 0: not display 1: display Ten place: A00-A15 parameter group display selection 0: not display 1: display	11	○
F16.01	Display of special parameters	Unit place: user determine parameter group display selection 0: not display 1: display Ten place: user change parameter group display selection 0: not display 1: display	01	○
F16.02	Function parameter modify control	0: can modify 1: can not modify	0	○
A00 Torque control and limited parameter				
A00.00	Speed/Troque control mode	0: speed control 1: torque control	0	☆
A00.01	Drive torque high limit source	0: number setting(A00.03) 1: AI1 2: AI2 3: reserved 4: high speed pulse setting 5: communication setting 6: min (AI1,AI2) 7: MAX (AI1,AI2)	0	☆

Function code	Function	Detailed instruction of parameters	Default value	
		1-7 full range corresponding to A00.03		
A00.02	Braking torque high limit source	0 :number setting (A00.03) 1: AI1 2: AI2 3: reserved 4: high speed pulse setting 5: communication setting	0	☆
A00.03	Drive torque high limit number setting	-200.0%～200.0%	150.0	○
A00.04	Torque filter			●
A00.05	Torque control FWD Max frequency	0.00Hz～Max frequency F00.06	50.00	○
A00.06	Torque control REV Max frequency	0.00Hz～Max frequency F00.10	50.00	○
A00.07	Torque ACC time	0.00s～650.00s	0.00	○
A00.08	Torque DEC time	0.00s～650.00s	0.00	○
A01 Vitual I/DO parameters				
A01.00	Vitual VDI1 terminal function selection	0~59	59	☆
A01.01	Vitual VDI2 terminal function selection	0~59	59	☆
A01.02	Vitual VDI3 terminal function selection	0~59	59	☆
A01.03	Vitual VDI4 terminal function selection	0~59	59	☆
A01.04	Vitual VDI5 terminal function selection	0~59	59	☆
A01.05	VDI terminal valid state source	0: inner connect vitual Dox 1: function code set valid or not Unit place: vitual VDI1 Ten place: vitual VDI2 Hundred place: vitual VDI3 Thousand place: vitual VDI4 Ten thousand place: vitual VDI5	11111	☆
A01.06	Vitual VDI terminal function code set valid state	0: invalid 1: valid Unit place:vitual VDI1 Ten place:vitual VDI2 Hundred place:vitual VDI3 Thousand place:vitual VDI4 Ten thousand place:vitual VDI5	11111	○
A01.07	AI1 terminal function selection (be DI)	0~59	59	☆
A01.08	AI2 terminal function selection (be DI)	0~59	59	☆
A01.09	AI3 terminal function	0~59	59	☆

Function code	Function	Detailed instruction of parameters	Default value	
	selection (be DI)			
A01.10	A1 be DI valid state selection	0: high electrical level 1: low electrical level Unit place: AI1 Ten place: AI2 Hundred place: reserve	111	☆
A01.11	Vitual VDO1 output selection	0~41(can be selected as communication control)	41	○
A01.12	Vitual VDO2 output selection	0~41(can be selected as communication control)	41	○
A01.13	Vitual VDO3 output selection	0~41(can be selected as communication control)	41	○
A01.14	Vitual VDO4 output selection	0~41(can be selected as communication control)	41	○
A01.15	Vitual VDO5 output selection	0~41(can be selected as communication control)	41	○
A01.16	VDO1 output delay time	0.0s ~ 3600.0s	3600.0	○
A01.17	VDO2 output delay time	0.0s ~ 3600.0s	3600.0	○
A01.18	VDO3 output delay time	0.0s ~ 3600.0s	3600.0	○
A01.19	VDO4 output delay time	0.0s ~ 3600.0s	3600.0	○
A01.20	VDO5 output delay time	0.0s ~ 3600.0s	3600.0	○
A01.21	VDO output terminal valid state selection	0-positive logic; 1-nagetive logic Unit place:VDO1 Ten place:VDO2 Hundred place:VDO3 Thousand place:VDO4 Ten thousand place:VDO5	11111	☆
A02 Group Motor 2 parameters				
A02.00	Motor type	0: normal asynchronous motor 1: change frequency asynchronous motor	0	☆
A02.01	Rated power of asynchronous motor	0.1kW~1000.0kW(Depend on model)	3.7	☆
A02.02	Rated frequency of asynchronous motor	0.01Hz~ (Max. frequency)F00.06	50.00	☆
A02.03	Rated speed of asynchronous motor	1rpm～65535rpm	1460	☆
A02.04	Rated voltage of asynchronous motor	1V～2000V	380	☆
A02.05	Rated current of asynchronous motor	0.01A~655.35A (inverter power <=55kw) 0.1A~6553.5A (inverter power >55kW)	9.00	☆
A02.06	Stator resistance of asynchronous motor	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	1.204	☆
A02.07	Rotor resistance of asynchronous motor	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	0.908	☆
A02.08	Inductance of asynchronous motor	0.01mH~655.35mH (inverter power <=55kW) 0.001mH~65.535mH (inverter power >55kW)	5.28	☆
A02.09	Mutual inductance of asynchronous motor	0.1mH~6553.5mH(inverter power <=55kW) 0.01mH~655.35mH(inverter power >55kW)	158.6	☆
A02.10	Non-load current of asynchronous motor	0.01A~A02.03(inverter power <=55kw) 0.1A~A02.03(inverter power >55kW)	4.24	☆
A02.11	Motor parameters autotuning	0: no actuation 1: dynamic autotuning (no load) 2: static autotuning 1 (with load)	0	☆

Function code	Function	Detailed instruction of parameters	Default value	
		3: static autotuning 2 (with load)		
A02.12	Encoder pulse quantity	1~65535	1024	☆
A02.13	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver encoder 3: Sin-Cos encoder 4: Line-saving UVW encoder	0	☆
A02.14	Speed feedback PG selection	0: local PG 1: expand PG 2: HDI high speed pulse input	0	☆
A02.15	ABZ encoder AB phase sequence	0: positive 1: negative	0	☆
A02.16	Encoder install position angle	0.0 ~ 359.9°	0.0	☆
A02.17	UVW signal phase sequence	0: positive 1: negative	0	☆
A02.18	UVW signal 0 position angle	0.0 ~ 359.9°	0.0	☆
A02.19	Resolver pole pair number	1~65535	1	☆
A02.20	Reserve			●
A02.21	Speed feedback PG disconnection detection time	0.0: no action 0.1s~10.0s	0.0	☆
A02.22	Speed loop proportional gain 1	1~100	30	○
A02.23	Integral time of speed loop 1	0.01s ~ 10.00s	0.50	○
A02.24	Switch frequency1	0.00 ~ A02.27	5.00	○
A02.25	Speed loop proportional gain 2	1~100	20	○
A02.26	Integral time of speed loop 2	0.01s~10.00s	1.00	○
A02.27	Switch frequency2	A02.24~max frequency F00.06	10.00	○
A02.28	Slip gain of vector control	50%~200%	100	○
A02.29	SVC Speed feedback filtering time	0.000s~1.000s	0.050	○
A02.30	Overexcitation gain of vector control	0~200	64	○
A02.31	Speed control (drive) torque max limit digital setting	0.0%~200.0%	150.0	○
A02.32	Speed control (drive) torque max limit source	0: A02.31 set 1: AI1 2: AI2 3: reserved 4: HDI high speed pulse setting 5: communication setting 6: min(AI1,AI2) 7: MAX(AI1,AI2) 1-7 Full scale corresponding to A02.31	0	○
A02.33	Speed control (braking) torque max limit source	0: A02.34 set 1: AI1 2: AI2 3: reserved	0	●

Function code	Function	Detailed instruction of parameters	Default value	
		4: HDI high speed pulse setting 5: communication setting 6: min(AI1,AI2) 7: MAX(AI1,AI2) 1-7 Full scale corresponding to A02.34		
A02.34	Speed control (braking) torque max limit digital setting	0.0%～200.0%	150.0	●
A02.35	Proportional gain of M axis	0～60000	2000	○
A02.36	Integral gain of M axis	0～60000	1300	○
A02.37	Proportional gain of T axis	0～60000	2000	○
A02.38	Integral gain of T axis	0～60000	1300	○
A02.39	Integral attribute of speed loop	Unit place:integral separation 0: Integral always valid 1: speed loop integral separation	0	○
A02.40	Synchronous motor weak magnetic mode selection	0: no weak magnetic 1: direct calculate 2: Automatic adjust	0	○
A02.41	Over modulation enable selection	0: forbid 1: enable	0	○
A02.42	Maximum output voltage coefficient	100%～110%	105	☆
A02.43	Maximum torque coefficient in weak magnetic region	50%～200%	100	○
A02.44	Selection of generation (braking) torque enabling under speed model	0:disable 1:enable	0	○
A02.45	Motor control mode	0:sensorless vector control (SVC) 1:vector control with sensor (FVC) 2:V/F control	2	☆
A02.46	ACC time / DEC time selection	0: same as motor 1 1: ACC time / DEC time 1 2: ACC time / DEC time 2 3: ACC time / DEC time 3 4: ACC time / DEC time 4	0	○
A02.47	Motor torque magnify	0.0%: automatic torque magnify 0.1%~30.0%	1.0	○
A02.48	reserve	reserve	0	●
A02.49	Oscillation suppression gain	0~100	0	○
A03 Group Reserve				
A04 Group Reserve				
A05 Group Control Optimization Parameters				
A05.00	DPWM switch high limit frequency	5.00Hz～max frequencyF00.06	8.00	○
A05.01	PWM modulate mode	0: Asynchronous modulate 1: Synchronous modulate	0	○
A05.02	Dead zone compensation mode selection	0: no compensation 1: compensation mode 1	1	○

Function code	Function	Detailed instruction of parameters	Default value	
		2: compensation mode 2		
A05.03	Random PWM	0: not choose 1～10: random depth selection	0	○
A05.04	Cycle by cycle current limiting enabling	0: disable 1: enable	1	○
A05.05	Current detection delay compensation	0～100	5	○
A05.06	Under voltage point setting	200.0v～2000.0v set by model 220v:200v 380v:350v 480v:350v 690v:650v 1140v:1100v	350.0	○
A05.07	reserved	reserved	2	☆
A05.08	Dead zone time adjust	100%～200%	150	☆
A05.09	Over voltage point setting	200.0v～2200.0vset by models 220v:400v 380v:810v	810.0	☆
A06 Group AI curve setting				
A06.00	Curve 4 min input	-10.00～A06.02	0.00	○
A06.01	Curve 4 min input set	-100.0%～100.0%	0.0	○
A06.02	Curve 4 inflection point 1input	A06.00～A06.04	3.00	○
A06.03	Curve 4 inflection point 1input set	-100.0%～100.0%	30.0	○
A06.04	Curve 4 inflection point 2input	A06.02～A06.06	6.00	○
A06.05	Curve 4 inflection point 2input set	-100.0%～100.0%	60.0	○
A06.06	Curve 4 Max input	A06.04～10.00	10.00	○
A06.07	Curve 4 Max input set	-100.0%～100.0%	100.0	○
A06.08	Curve 5 min input	-10.00～A06.10	-10.00	○
A06.09	Curve 5 min input set	-100.0%～100.0%	-100.0	○
A06.10	Curve 5 inflection point 1input	A06.08～A06.12	-3.00	○
A06.11	Curve 5 inflection point 1input set	-100.0%～100.0%	-30.0	○
A06.12	Curve 5 inflection point 2input	A06.10～A06.14	3.00	○
A06.13	Curve 5 inflection point 2input set	-100.0%～100.0%	30.0	○
A06.14	Curve 5 Max input	A06.12～10.00	10.00	○
A06.15	Curve 5 Max input set	-100.0%～100.0%	100.0	○
A06.16～23	Reserve	Reserve	0	●
A06.24	AI1set jump point	-100.0%～100.0%	0.0	○
A06.25	AI1set jump range	0.0～100.0%	0.5	○

Function code	Function	Detailed instruction of parameters	Default value	
A06.26	AI2set jump point	-100.0%～100.0%	0.0	○
A06.27	AI2set jump range	0.0～100.0%	0.5	○
A06.28	Reserve	Reserve	0.0	○
A06.29	Reserve	Reserve	0.5	○
A07 Group Reserved				
A08 Group Point-to-point communication				
A08.00	Main-slave control function selection	0: invalid 1: valid	0	☆
A08.01	Main-slave selection	0: main machine 1: slave machine	0	☆
A08.02	Main-slave information interaction	Unit place: slave machine command follow 0: slave machine not follow main machine run command to run 1: slave machine follow main machine run command to run Ten place: slave machine fault information transmit 0: slave machine fault information not transmit 1: slave machine fault information transmit Hundred place: main machine display slave machine off line 0: slave machine off line main machine not alarm fault 1: slave machine off line main machine alarm fault (Err16)	11	☆
A08.03	Main machine send data function selection	0: run frequency 1: aim frequency	0	☆
A08.04	Receive data 0 bias	-100.00%~100.00%	0.00	○
A08.05	Receive data gain	-10.00~10.00	1.00	○
A08.06	point-to-point communication disconnection detection time	0.0~10.0s	1.0	☆
A08.07	point-to-point communication main machine data send cycle	0.001~10.000	0.001	☆
A08.08	Frequency receive data 0 bias	-100.00%~100.00%	0.00	○
A08.09	Frequency receive data gain	-10.00~10.00	1.00	○
A08.10	Slave machine frequency FWD max bias	0.00~100.00%	10.00	○
A08.11	Window	0.20Hz~10.00Hz	0.50	○
A09 group Water supply parameters				
A09.00	Set pressure	0.000~60.000Mpa	0.000	○
A09.01	Feedback full range max pressure	0.000~60.000Mpa	1.000	○
A09.02	Lower limit pressure	0.000~60.000Mpa	0.000	○
A09.03	Upper limit pressure	0.000~60.000Mpa	1.000	○
A09.04	Wake up pressure	0.000~60.000Mpa	0.000	○
A09.05	Dormancy pressure	0.000~60.000Mpa	1.000	○
A09.06	Process time of feedback pressure bigger than	0.0s~2500.0s	10.0	○

Function code	Function	Detailed instruction of parameters	Default value	
	dormancy pressure			
A09.07	Frequency dormancy	0.0Hz~max frequency(F00.06)	20.00	○
A09.08	Keep time of frequency lower than dormancy frequency	0.0s~2500.0s	10.0	○
A09.09	Wake up delay time	0.0s~2500.0s	0.0	○
A09.10	Reserved			
A09.11	Dormancy selection	0: frequency Dormancy valid ; 1: pressure Dormancy valid ;	0	○
A09.12	Keypad analog filter	0~8	3	○
A10~A15 group Reserved				
B00 group Display				
b00.00	Running frequency	Unit:Hz	0.01	●
b00.01	Set frequency	unit:Hz	0.01	●
b00.02	Bus voltage	unit:V	0.1	●
b00.03	Output voltage	unit:V	1	●
b00.04	Output current	unit:A	0.01	●
b00.05	Output power	unit:kw	0.1	●
b00.06	Output torque	unit:%	0.1	●
b00.07	DI input state		0x0000	●
b00.08	DO output state		0x0000	●
b00.09	AI1voltage	unit:V	0.01	●
b00.10	AI2voltage/current	unit:V/mA	0.01	●
b00.11	Reserved	Reserved	0.01	●
b00.12	Count value		1	●
b00.13	Depth value		1	●
b00.14	Load speed display		1	●
b00.15	PID set	unit:%	1	●
b00.16	PID feedback	unit:%	1	●
b00.17	PLC steps		1	●
b00.18	Input pulse frequency	unit:kHz	0.01	●
b00.19	Feedback speed	unit:Hz	0.01	●
b00.20	Remaining running time	unit:min	0.1	●
b00.21	AI1 before correction voltage	unit:V	0.001	●
b00.22	AI2 before correction voltage/current	unit:V/mA	0.001	●
b00.23	Reserved	unit:V	0.001	●
b00.24	Linear speed	unit:m/min	1	●
b00.25	Current power on time	unit:min	1	●
b00.26	Current running time	unit:min	0.1	●
b00.27	Input pulse frequency	unit:kHz	1	●
b00.28	Communication setting	unit:Hz	0.01	●
b00.29	Reserved			●
b00.30	Main frequency X display	unit:Hz	0.01	●
b00.31	Auxiliary frequency Y display	unit:Hz	0.01	●
b00.32	Check any memory address value		1	●
b00.33	Synchronous machine rotor	unit:°	0.1	●

Function code	Function	Detailed instruction of parameters	Default value	
	position			
b00.34	Reserved		1	●
b00.35	Aim torque	unit:%	0.1	●
b00.36	Reserved		1	●
b00.37	Power factor angle	unit:°	0.1	●
b00.38	Reserved		1	●
b00.39	VF separation aim voltage	unit:V	1	●
b00.40	VF separation output voltage	unit:V	1	●
b00.41	DI input state visual display		1	●
b00.42	DO input state visual display		1	●
b00.43	DI function state visual display1(function 01～function 40)		1	●
b00.44	DI function state visual display (function 41～function 80)		1	●
b00.45	Fault information		1	●

CHAPTER 5 PARAMETER EXPLAIN

5.1 Run command set mode

Run command is used to control inverter start, stop, FWD, REV, JOG etc. It can be set one channel by F00.01 of 3 channels.

Function code	Name	Default value	Set range	Explain
F00.01	Run command channel	0	0	Keypad
			1	Terminal
			2	485 communication

If F00.01=0, RUN, STOP/RESET keys on keypad can be used to give run command. Press RUN, inverter will run. Press STOP/RESET key while inverter is running, it will DEC to stop or free stop. RUN indicator will be off while inverter totally stop.

If F00.01=1, terminals control inverter start and stop. F06.11 can be set for control mode.

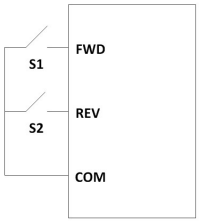
Function code	Name	Default value	Set range	Explain
F06.11	Terminal control running mode	0	0: two-wire control mode 1 1: two-wire control mode 2 2: three-wire control mode 1 3: three-wire control mode 2	4 control modes by terminals

DI1 to DI4 terminals can be defined to be any input terminals by F06.00 to F06.03.

- F06.11=0: two-wire control mode 1 is most popular in terminals channel.

Function code	Name	Set value	Explain
F06.11	Terminal control running mode	0	Two-wire control mode 1
F06.00	Functions of DI1 terminal	1	Forward (FWD)
F06.01	Functions of DI2 terminal	2	Reverse (REV)

For example, enable and direction are one. This mode is the most commonly used two-wire mode. The forward and reverse rotation of the motor is determined by the defined DI1 (FWD) and DI2 (REV) terminal commands. When the control switch S1 is closed and S2 is open, the motor rotates forward, when the control switch S1 is open, S2 is closed, the motor reverses. When both S1 and S2 are open, the motor stops, and when both S1 and S2 are closed, the motor maintains the previous state. As shown below:



FWD	REV	Run command
OFF	OFF	Stop
ON	OFF	FWD
OFF	ON	REV
ON	ON	Hold

Figure 5-1 Two-wire control mode 1

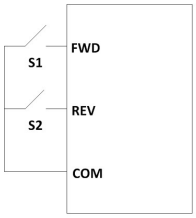
- F06.11=1: two-wire control mode 2

For example, the DI1 terminal is assigned the function of running command, and the DI2 terminal is assigned the function of forward and reverse running direction. Enable is separated from direction. The FWD defined in this mode is the enable terminal. The

direction is determined by the state of the defined REV.

The parameters are set as follows:

Function code	Name	Set value	Explain
F06.11	Terminal control running mode	1	Two-wire control mode 2
F06.00	Functions of DI1 terminal	1	Forward running (FWD)
F06.01	Functions of DI2 terminal	2	Reverse running (REV)



FWD	REV	RUN COMMAND
OFF	OFF	Stop
ON	OFF	FWD
OFF	ON	Stop
ON	ON	REV

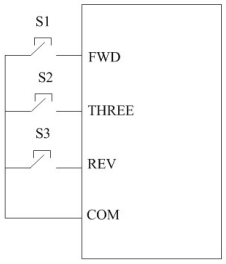
Figure 5-2 Two-wire control mode 2

As shown in the figure above, this control mode is in the state, when S1 is closed, S2 closes the inverter to run forward, S2 opens the inverter to reverse, and S1 opens the inverter to stop running.

- F06.11=2: three-wire control mode 1

Function code	Name	Set value	Explain
F06.11	Terminal control running mode	2	Three-wire control mode 1
F06.00	Functions of DI1 terminal	1	Forward running (FWD)
F06.01	Functions of DI2 terminal	2	Reverse running (REV)
F06.02	Functions of DI3 terminal	3	Three line operation control

This mode defines the three-wire running terminal (THREE) enable terminal, the running command is generated by FWD, REV pulse, and both control the running direction at the same time. The inverter operation requires the terminal (THREE) to be in the closed state, and the disconnection generates a (THREE) stop command.



THREE	FWD	REV	Run direction
ON	OFF→ ON	---------	FWD
ON	---------	ON→ OFF	REV
ON→ OFF	---------	---------	DEC stop

Figure 5-3 Three-wire control mode 1

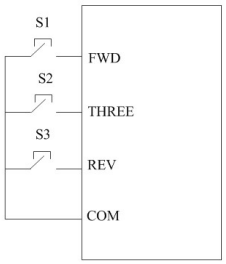
As shown in the figure above, in this control mode, when the S2 button is closed, press the S1 button to run the inverter, and by changing the S3 state, the inverter is controlled to rotate forward and reverse.

➢ F06.11=3 three-wire control mode 2

This mode defines the three-wire running terminal (THREE) enable terminal, the running command is generated by FWD, REV pulse, and both control the running direction at the same time. Inverter operation requires terminal (THREE) to be in closed state, and (THREE) to be disconnected to generate a stop command.

The parameters are set as follows

Function code	Name	Set value	Explain
F06.11	Terminal control running mode	3	Three-wire control mode 2
F06.00	Functions of DI1 terminal	1	Forward running (FWD)
F06.01	Functions of DI2 terminal	2	Reverse running (REV)
F06.02	Functions of DI3 terminal	3	Three line operation control



THREE	FWD	REV	Run direction
ON	OFF→ ON	---------	FWD
ON	---------	ON→ OFF	REV
ON→ OFF	---------	---------	DEC stop

Figure 5-4 Three-wire control mode 2

As shown in the figure above, in this control mode, when the S2 button is closed, press the S1 button to rotate forward, press the S2 button to reverse, and the inverter will stop when S2 is disconnected.

➢ 485 run command channel.

Control inverter to start or stop by Modbus communication.

5.2 Frequency input mode

There are four input methods for the frequency command, namely, select the main frequency command, select the auxiliary frequency command, select the superposition of the main and auxiliary frequency commands, and select the command source to bind the main frequency command. 4 frequency source input modes: main frequency source, auxiliary frequency source, main +auxiliary frequency source and source

➢ Select the input method of the main frequency command

Set parameter F00.02 to select the input of main frequency command. There are 10 main frequency sources of the inverter, which are digital setting (no memory when power off), digital setting (memory when power off), AI1, A12, panel potentiometer AI0, high-speed pulse input, multi-step speed command, simple PLC, PID, communication given.

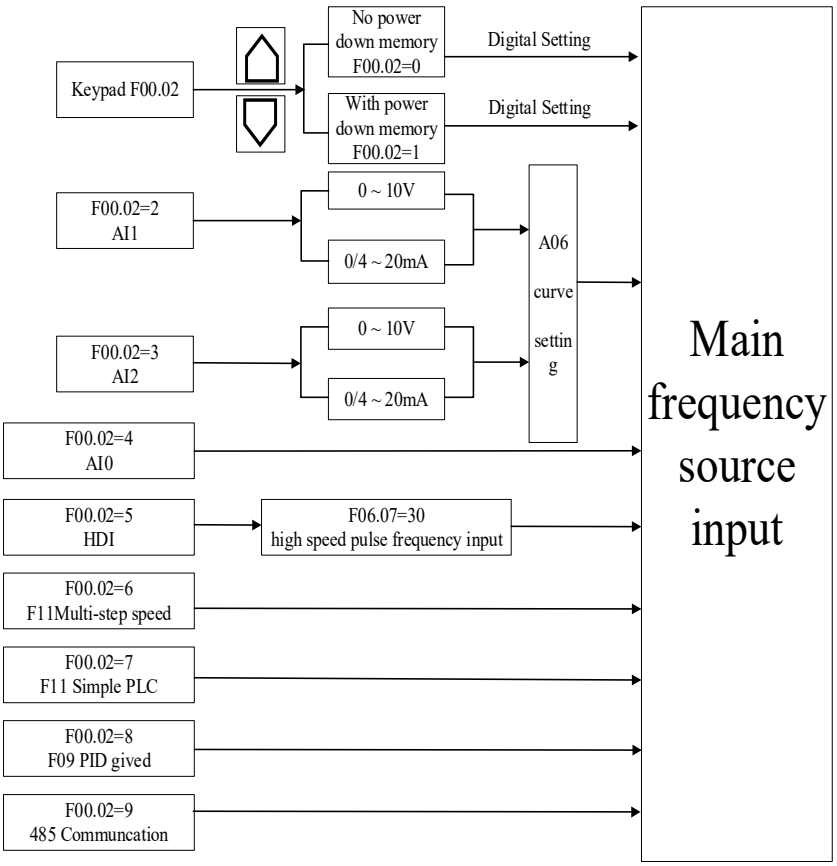


Figure 5-5 Frequency source input

Function code	Name	Default value	Set range	Explain
F00.02	Main frequency source	0	0	digital setting (pre-set frequency F00.09, UP/DOWN change, no power down memory)
			1	digital setting (pre-set frequency F00.09, UP/DOWN change, with power down memory)
			2	AI1
			3	AI2
			4	keypad potentiometer AI0
			5	high speed pulse input
			6	multi-step speed
			7	simple PLC
			8	PID
			9	485 communication

➢ Set the main frequency through the “operation panel” (digital setting)

There are two cases for setting the main frequency with the operation panel:

F00.02=0 (no memory after power failure), and F00.22=0, that is, after the inverter is stopped or powered on again after power failure, the set frequency value will return to the “preset frequency” (F00.09) setting value.

F00.02=1 (power-off memory), and F00.22=1, that is, when the inverter is powered on again after power-off, the set frequency is the frequency set value at the last power-off time.

Set the main frequency via "analog"

Set the main frequency through the analog input, AI0, AI1, AI2, three terminals can be selected.

F00.02=4 Panel potentiometer AI0 terminal input setting frequency;

F00.02=2 AI1 terminal input setting frequency;

F00.02=3 AI2 terminal input setting frequency.

The AI terminal is used as the given frequency source, and each AI terminal can select 5 different AI curves. Therefore, first introduce the setting method of AI curve, and then introduce how to select the corresponding AI curve for the AI terminal. The setting steps are as follows:

<table>
<tr><td>Setting steps</td><td>Related parameters</td><td colspan="2">Related parameters Description</td></tr>
<tr><td rowspan="5">(Step 1) AI curve setting method: F06.33 AI setting curve selection</td><td>F06.13～F06.16</td><td>Curve 1 setting</td><td>Commonly used</td></tr>
<tr><td>F06.18～F06.21</td><td>Curve 2 setting</td><td>Commonly used</td></tr>
<tr><td>F06.23～F06.26</td><td>Curve 3 setting</td><td>Commonly used</td></tr>
<tr><td>A06.00～A06.07</td><td>Curve 4 setting</td><td></td></tr>
<tr><td>A06.08～A06.15</td><td>Curve 5 setting</td><td></td></tr>
<tr><td rowspan="2">(Step 2) AI terminal selection AI curve method: AI terminal select curve and filter time setting</td><td>F06.33</td><td colspan="2">AI1 curve selection (AI terminal can select any AI curve. Generally, the default value F06.33=321 is used, that is, AI1 selects curve 1, AI2 selects curve 2)</td></tr>
<tr><td>F06.17, F06.22</td><td colspan="2">AI1, AI2 filter time</td></tr>
<tr><td></td><td></td><td>F00.02=4</td><td>Choose to use panel potentiometer</td></tr>
<tr><td rowspan="2">(Step 3) AI terminal as frequency source setting: select the AI input terminal of the frequency source command according to the terminal characteristics.</td><td rowspan="2">F00.02 (main frequency command input selection) current input)</td><td>F00.02=2</td><td>Select to use AI1 (voltage or current input can be selected by jumper cap)</td></tr>
<tr><td>F00.02=3</td><td>Select to use AI2 (voltage or current input can be selected by jumper cap)</td></tr>
</table>

➢ AI curve setting method:

There are 5 types of AI curves, of which curve 1, curve 2 and curve 3 are all 2-point curves, and the relevant parameters are F06.13~F06.16. The curves 4 and 5 are both 4-point curves, and the relevant parameters are in the A06 group. The setting of the AI curve is actually to set the relationship between the analog input voltage (or analog input current) and the set value it represents.

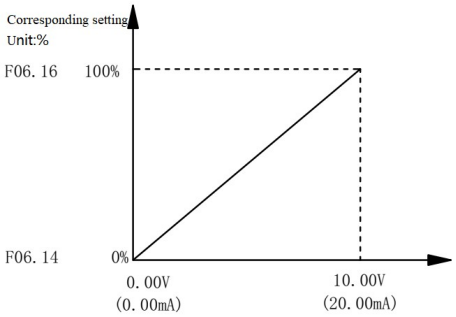


Figure 5-6 Schematic diagram of AI1 curve setting

Function code	Explain	Default value	Set range
F06.13	Curve 1 minimum input	0.00	0.00V～F06.15
F06.14	Curve 1 minimum input corresponding setting	0.0	-100.0%～100.0
F06.15	Curve 1 maximum input	10.00	F06.13～10.00V
F06.16	Curve 1 maximum input corresponding setting	100.0	-100.0%～100.0%

When AI is given as frequency, the voltage or current input corresponds to 100% of the setting, which refers to the percentage relative to "maximum frequency F00.06". When the analog input is current, 1mA current is equivalent to 0.5V voltage, and 0~20mA is equivalent to 0~10V voltage.

The setting method of curve 2 and curve 3 is the same as that of curve 1. The relevant parameters of curve 2 are F06.18~F06.21, and the relevant parameters of curve 3 are F06.23~F06.26. As shown in the figure below, it corresponds to the setting of AI curve 2, in which, F06.18=2, F06.19=0, F06.20=10, F06.21=100%, generally used for 4~20mA current input occasions.

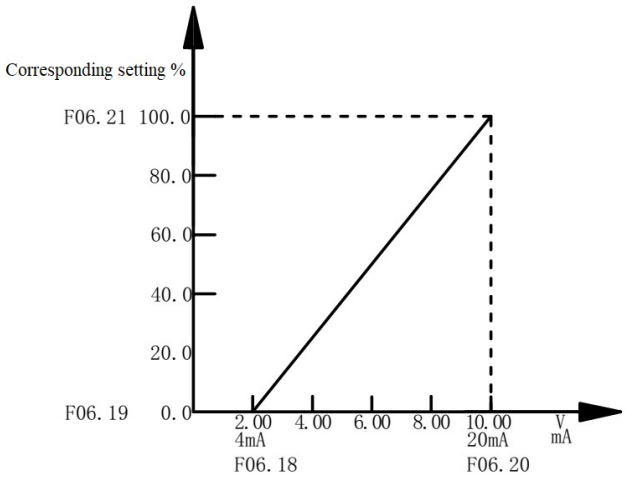


Figure 5-7 Schematic diagram of AI2 curve setting

Curve AI2 setting

Function code	Explain	Defaul t value	Set range
F06.18	Curve 2 minimum input	0.00	0.00V～F06.20
F06.19	Curve 2 minimum input corresponding setting	0.0	-100.0%～100.0%
F06.20	Curve 2 maximum input	10.00	F06.18～10.00V
F06.21	Curve 2 maximum input corresponding setting	100.0	-100.0%～100.0%
F06.23	Curve 3 minimum input	-10.00	-10,00V～F06.25
F06.24	Curve 3 minimum input corresponding setting	-100.0	-100.0%～100.0%
F06.25	Curve 3 maximum input	10.00	F06.23～10.00V
F06.26	Curve 3 maximum input corresponding setting	100.0	-100.0%～100.0%

The functions of curve 4 and curve 5 are similar to those of curve 1 to curve 3, but curve 1 to curve 3 are straight lines, while curve 4 and curve 5 are 4-point curves, which can realize a more flexible correspondence. The following figure is a schematic diagram of the setting of curve 4 and curve 5.

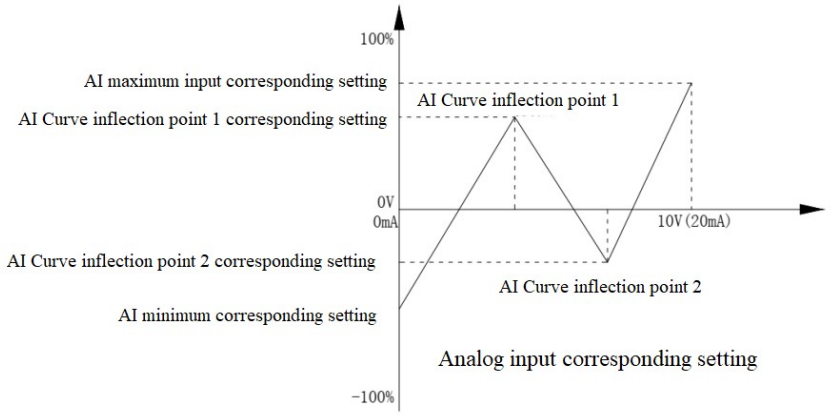


Figure 5-8 Schematic diagram of setting curve 4 and curve 5

Function code	Explain	Defaul t value	Set range
A06.00	Curve 4 minimum input	0.00	-10.00～A06.02
A06.01	Curve 4 minimum input setting	0.0	-100.0%～100.0%
A06.02	Curve 4 Knee 1 Input	3.00	A06.00～A06.04
A06.03	Curve 4 inflection point 1 input setting	30.0	-100.0%～100.0%
A06.04	Curve 4 Knee 2 Input	6.00	A06.02～A06.06
A06.05	Curve 4 inflection point 2 input setting	60.0	-100.0%～100.0%
A06.06	Curve 4 maximum input	10.00	A06.04～10.00
A06.07	Curve 4 maximum input setting	100.0	-100.0%～100.0%
A06.08	Curve 5 minimum input	-10.00	-10.00～A06.10
A06.09	Curve 5 minimum input setting	-100.0	-100.0%～100.0%
A06.10	Curve 5 Knee 1 Input	-3.00	A06.08～A06.12
A06.11	Curve 5 inflection point 1 input setting	-30.0	-100.0%～100.0%

A06.12	Curve 5 Knee 2 Input	3.00	A06.10～A06.14
A06.13	Curve 5 inflection point 2 input setting	30.0	-100.0%～100.0%
A06.14	Curve 5 maximum input	10.00	A06.12～10.00
A06.15	Curve 5 maximum input setting	100.0	-100.0%～100.0%

➢ Set the main frequency by "pulse"

Set the parameters and select the input pulse as the main frequency. When the main frequency is "pulse given (HDI)", the pulse given can only be input from the multi-function input terminal HDI. Pulse given signal specifications: voltage range 9V~30V, frequency range 0 kHz~50 kHz.

Function code	Explain	Default value	Set range	Explain
F06.28	High-speed pulse minimum input	0.00	0.00kHz～F06.30	
F06.29	High-speed pulse minimum input setting	0.0	-100.0%～100.0%	Percentage of relative maximum frequency F00.06
F06.30	High-speed pulse maximum input	50.00	F06.28～100.00kHz	
F06.31	High-speed pulse maximum input setting	100.0	-100.0%～100.0%	Percentage of relative maximum frequency F00.06
F06.32	High-speed pulse filter time	0.10	0.00s~10.00s	

The relationship between the input pulse frequency of HDI terminal and the corresponding setting is set through F06.28~F06.31. The corresponding relationship is a straight line corresponding relationship between two points. The setting corresponding to the pulse input is 100.0%, which refers to the percentage of the relative maximum frequency F00.06. The specific settings are as follows:

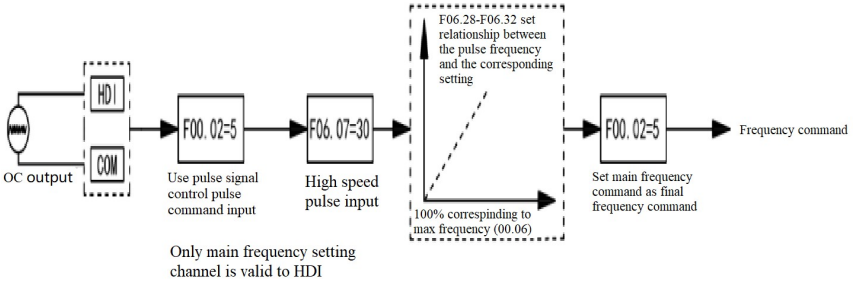


Figure 5-9 Pulse given input main frequency parameter setting

➢ Set the main frequency through " multi-step speed command"

Set the parameters, and select the multi-step speed command as the main frequency. It is suitable for applications that do not need to continuously adjust the operating frequency of the inverter and only need to use several frequency values.

This series of inverters can set up to 16 steps of operating frequency, which can be selected by the combination of 4 DI terminal input signals. It is also allowed that less than 4 terminals are used for multi-step speed frequency setting. For the missing setting bits, it is always calculated according to state 0. The corresponding relationship between the step number of multi-step speed and the number of DI terminals:

2-step speed: 1 DI terminal

3 to 4 step speeds: 2 DI terminals;

5~8 step speed: 3 DI terminals,

9~16 step speed: 4 DI terminals.

The required multi-step speed frequency is set by the multi-step frequency table of group F11, and the parameters are as follows.

Function code	Name	Explain	Default value
F11.00	Multi-step speed command 0	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.01	Multi-step speed command 1	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.02	Multi-step speed command 2	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.03	Multi-step speed command 3	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.04	Multi-step speed command 4	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.05	Multi-step speed command 5	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.06	Multi-step speed command 6	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.07	Multi-step speed command 7	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.08	Multi-step speed command 8	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.09	Multi-step speed command 9	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.10	Multi-step speed command 10	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.11	Multi-step speed command 11	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.12	Multi-step speed command 12	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.13	Multi-step speed command 13	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.14	Multi-step speed command 14	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.15	Multi-step speed command 15	-100.0%～100.0% (100.0% corresponding maximum frequency F00.06)	0
F11.51	Multi-step 0 given command mode	0: F11.00 1:AI1 2:AI2	0

		3: reserved 4: high speed pulse 5: PID 6: F00.09 given, UP/DOWN can modify	

In the above figure, DI1, DI2, DI3, DI4 are selected as the signal input terminals for multi-step frequency designation, and they are sequentially composed of 4 as a binary number, and the multi-step frequency is selected by combining the values according to the state. When (DI1, DI2, DI3, DI4) = (0, 1, 0, 0), the number of state combinations formed is 4, and the frequency value set by the parameter will be selected (see the table below for the selection method) By (F11 .04)*(F00.6) The target frequency is automatically calculated. The detailed settings are shown in the figure below:

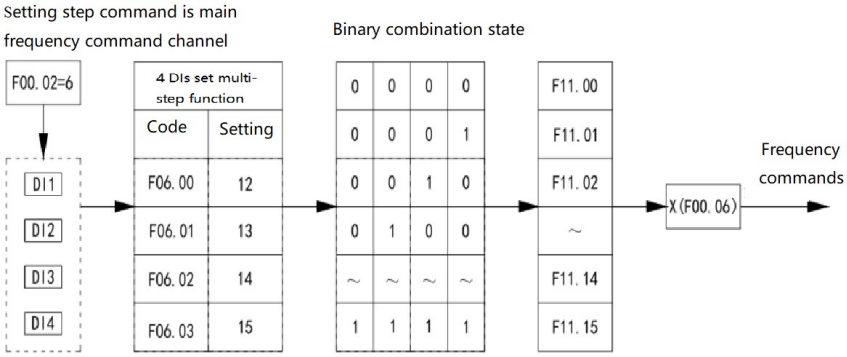


Figure 5-10 Setting of multi-speed mode

4 multi-step command terminals can be combined into 16 states, and these 16 states correspond to 16 command set values. The details are shown in the following table:

Table 5-1 Multi-step instruction function description table

Multi-stage command terminal 3 Multi-stage command terminal 2 Multi-stage command terminal 1 Multi-stage setting

Multi-step command terminal 4	Multi-step command terminal 3	Multi-step command terminal 2	Multi-step command terminal 1	Multi-step setting
OFF	OFF	OFF	OFF	Multi-step command 0
OFF	OFF	OFF	ON	Multi-step command 1
OFF	OFF	ON	OFF	Multi-step command 2
OFF	OFF	ON	ON	Multi-step command 3
OFF	ON	OFF	OFF	Multi-step command 4
OFF	ON	OFF	ON	Multi-step command 5
OFF	ON	ON	OFF	Multi-step command 6
OFF	ON	ON	ON	Multi-step command 7

ON	OFF	OFF	OFF	Multi-step command 8
ON	OFF	OFF	ON	Multi-step command 9
ON	OFF	ON	OFF	Multi-step command 10
ON	OFF	ON	ON	Multi-step command 11
ON	ON	OFF	OFF	Multi-step command 12
ON	ON	OFF	ON	Multi-step command 13
ON	ON	ON	OFF	Multi-step command 14
ON	ON	ON	ON	Multi-step command 15

➢ Set frequency through "Simple PLC"

Set parameter F00.02=7, and select simple PLC as the main frequency.

When simple PLC is used as the main frequency, parameters F11.16~F11.18 need to be set (see the table below for the setting method), and F11.19~F11.20 are used to set the acceleration and deceleration time of each step

F11.16	PLC work mode	Setting range: 0～2	Factory default: 0

0: stop after a single run

The inverter will automatically stop after completing a single cycle, and it needs to give the running command again to start.

1: run at the final value after a single run

After the inverter completes a single cycle, it will automatically keep the running frequency and direction of the last step.

2: circulate to run

After the inverter completes a single cycle, it will automatically start the next cycle, until there is a stop command, the inverter will stop.

F11.17	PLC power failure memory	Setting range: 0～1	Factory default: 0

0:no power failure memory

1: with power failure memory

PLC power failure memory refers to the memory of the PLC's running stage and operating frequency before power-off.

F11.18	PLC section 0 running time	Setting range：0～6553.5	Factory default：0
F11.19	The selection of acceleration and deceleration time of PLC segment 0	Setting range：0～3	Factory default：0
F11.50	Simple PLC time unit selection	Setting range：0～1	Factory default：0

0：second (s)

1：hour (h)

F11.18	Simple PLC step 0 running time	Setting range：0.0～6553.5s(h)	Factory default ：0000.0s(h)

F11.20	Simple PLC step 1 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.22	Simple PLC step 2 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.24	Simple PLC step 3 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.26	Simple PLC step 4 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.28	Simple PLC step 5 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.30	Simple PLC step 6 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.32	Simple PLC step 7 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.34	Simple PLC step 8 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.36	Simple PLC step 9 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.38	Simple PLC step 10 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.40	Simple PLC step 11 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.42	Simple PLC step 12 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.44	Simple PLC step 13 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.46	Simple PLC step 14 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)
F11.48	Simple PLC step 15 running time	Setting range: 0.0～6553.5s(h)	Factory default : 0000.0s(h)

This group of function codes respectively sets the running time of different segment speeds in simple PLC mode.

5.3 PID control

PID control is a common method used for process control. It adjusts the inverter's operation by performing proportional (P), integral (I), and differential (D) operations on the difference between the feedback signal of the controlled variable and the target signal. The output frequency forms a negative feedback system to stabilize the controlled quantity on the target quantity. It is suitable for process control such as flow control, pressure control and temperature control. The basic control block diagram is as follows:

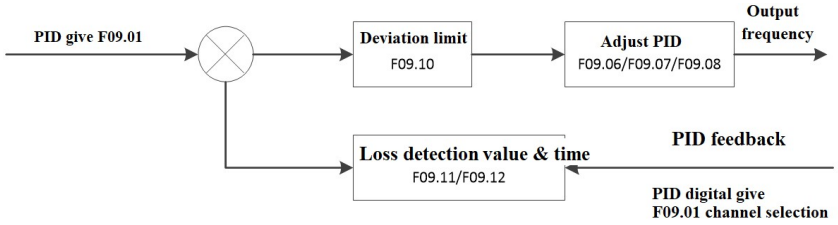


Figure 5-11 PID control principle

In the system, PID control is valid only when X frequency source reference selection (F00.02) or Y frequency source reference selection (F00.03) is PID control reference.

F09.00	PID given channel	Setting range：0 ～ 7	Factory default：0

0: Digital given (F09.01).
1: Analog input AI1
2: Analog input AI2
3: reserved
4: High-speed pulse given
5:485 communication given
6: Multi-step instruction given
7: Pressure setting

When the frequency source selects PID, this parameter determines the target given channel of the process PID. The set target of the process PID is the relative value, and the set 100.0% corresponds to 100.0% of the feedback signal of the controlled system; the range of the PID is not necessary, because no matter how much the range is set, the system is based on the relative value (0.0～ 100.0%) for operation.

F09.02	PID feedback channel	Setting range：0 ～ 8	Factory default：0

0: Analog AI1 feedback
1: Analog AI2 feedback
2: reserved
3: AI1 - AI2 feedback
4: High-speed pulse setting
5: Communication given
6: AI1 + AI2 feedback
7: MAX(|AI1|, |AI2|)
8: MIN(|AI1|, |AI2|)

F09.03	PID action direction	Setting range：0 ～ 1	Factory default：0

0: positive action

When the feedback signal is greater than the given PID, the output frequency of the inverter is required to decrease, so that the PID can reach a balance, such as the tension PID control of the winding.

1: Reverse action

When the feedback signal is greater than the given PID, the output frequency of the inverter is required to increase, so that the PID can be balanced, such as the tension PID control of the unwinding.

F09.06, F09.17	Proportional gain P	Setting range：0.00 ～ 100.00	Factory default：0.10
F09.07. F09.18	Integration time I	Setting range：0.01 ～ 10.00s	Factory default：0.10s
F09.08, F09.19	Differential time D	Setting range：0.00 ～ 10.00s	Factory default：0.00s

Proportional gain P:

The role of the proportional link is to react instantaneously to deviations. Once the deviation occurs, the controller will immediately take control, so that the control amount changes in the direction of reducing the deviation. The larger the proportional gain, the stronger the control effect and the faster the transition process. However, if the proportional gain is too large, it is easy to generate vibration and destroy the stability of the system.

Integration time I:

The function of the integral link is to eliminate the static error, but it will also reduce the response speed of the system and increase the overshoot of the system. The longer the integration time is, the longer it takes for the system to eliminate the deviation, but the overshoot will be reduced and the transition will be smoother.

Differential time D:

The function of the differential link is to speed up the adjustment process, and to give appropriate corrections in advance according to the change trend of the deviation to suppress the deviation change. The longer the differentiation time, the stronger the effect of suppressing the variation of the deviation.

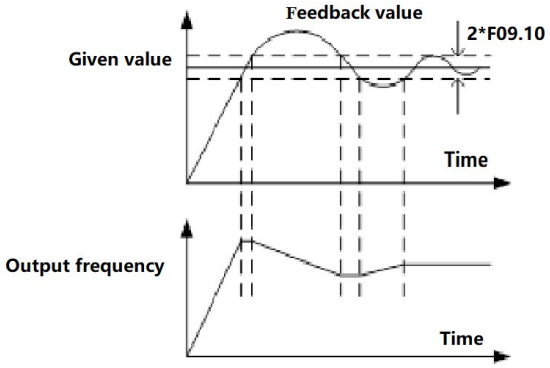


Figure 5-12 Process PID control example

When the PID feedback value is less than the feedback loss detection value (F09.11), the loss detection timing starts. If the anti-loss detection time (F09.12) is reached, the inverter will report the PID feedback loss fault (E.PIDE).

5.4 Start and stop mode

The inverter has three starting methods, namely direct start, speed tracking start, and pre-excitation start. Set parameter F02.00 to select the starting method of the inverter.

Function code	Name	Default value	Setting range	Parameter explain
F02.00	Start mode	0	0: start at the starting frequency 1: start after rotating speed tracking 2: Pre excitation	If you need to start a motor that is rotating at a high speed, it is recommended to use the speed tracking restart Pre-excitation start (only for AC asynchronous machines)
F02.20	Speed track mode	0	0: start from stop frequency 1: start from working frequency 2: start from max frequency	—
F02.21	Quick or slow speed track	20	1～100	—
F02.02	Starting frequency	0.00	0.00～10.00Hz	When the given frequency is less than the starting frequency, the inverter will not start and is in the standby state.
F02.03	Hold time of starting frequency	0.0	0.0s～100.0	During the forward/reverse switching process, this parameter has no effect. The starting frequency holding time is not included in the acceleration time. But it is included in the running time of simple PLC.
F02.04	Start DC braking/Pre excitation current	0	0～100%	The greater the DC braking current, the greater the braking force, 100% corresponds to the rated current of the motor (the current upper limit is 80% of the rated current of the inverter)
F02.05	Start DC braking/Pre excitation time	0.0s	0.0s～100.0s	Start DC braking is only valid when the start mode is direct start.

➢ Direct start

Set the parameters, the inverter will start directly, which is suitable for most loads, as shown in Figure 5-13. Adding "start frequency" before starting is suitable for lifting loads such as elevators and hoists, as shown in Figure 5-14. Adding "DC braking" before starting is suitable for occasions where the motor may rotate during starting, as shown in Figure 5-15.

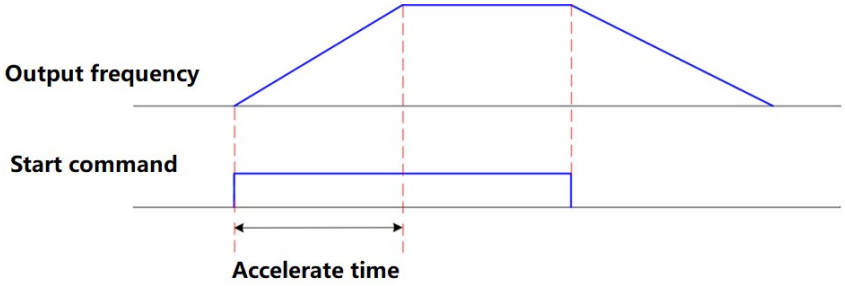


Figure 5-13 Direct start sequence diagram

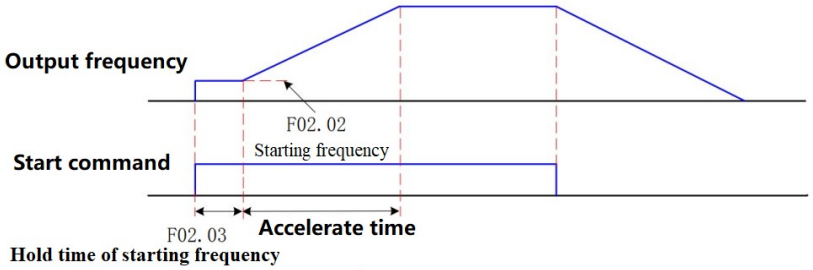


Figure 5-14 Startup sequence diagram with startup frequency

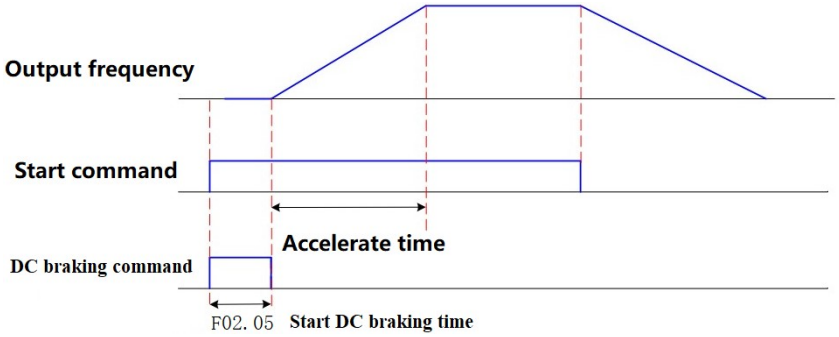


Figure 5-15 Startup sequence diagram with DC braking

➢ Speed tracking restart

Set F02.00=1, the inverter starts after speed tracking (the inverter first judges the speed and direction of the motor, and then starts with the tracked motor frequency), which is suitable for the drive of large inertia mechanical loads. If the inverter starts When running, the load motor is still running in inertia, and the speed tracking is adopted to start, which can avoid the occurrence of overcurrent at the start. The frequency curve of the startup process is shown in the following figure:

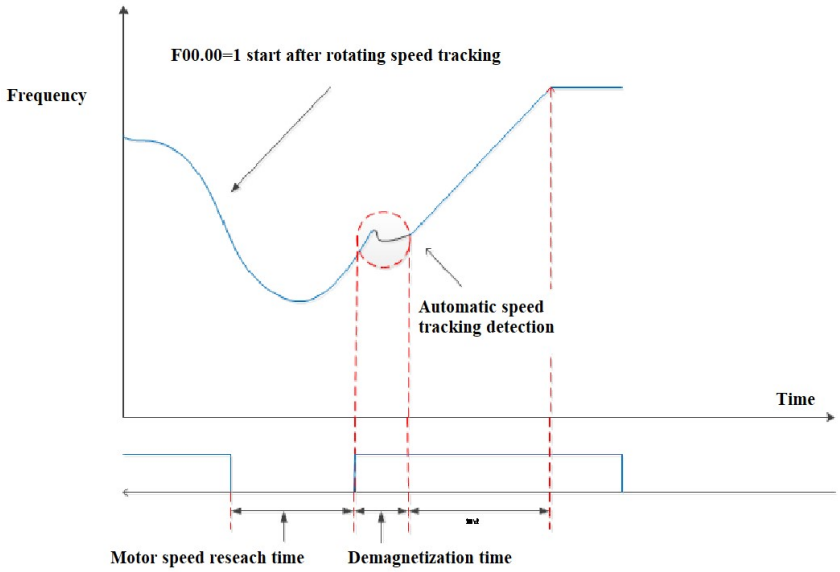


Figure 5-16 Speed tracking restart mode

➢ Pre-excitation start

Setting parameters, the inverter starts with pre-excitation. This method is only applicable to the SVC and FVC control modes of asynchronous motors. Pre-excitation of the motor before starting can improve the rapid response of the motor and reduce the starting current. It is the same after moving and restarting.

5.5 Jog operation

In some application sites, the inverter is required to run at a low speed for a short time to test the operation status of the equipment, and jog operation can be used. The start mode adopts direct start (F02.00=0), and the stop mode adopts deceleration stop (F02.10=0).

Function code	Name	Default value	Setting range	Parameter explain
F00.23	Basis frequency of ACC/DEC time	0	0: Max frequency (F00.06) 1: setting frequency 2:100Hz	-
F13.00	Jogging frequency	2.00	0.00Hz ～ max frequencyF00.06	-
F13.01	Jogging running ACC time	20.0s	0.0～6500.0s	It refers to the time it takes for the inverter to accelerate from 0Hz to " Basis frequency of ACC/DEC time F00.23".
F13.02	Jogging running DEC time	20.0s	0.0～6500.0s	Refers to the time required for the inverter to decelerate from " Basis frequency of

				ACC/DEC time F00.23" to 0Hz
F13.25	Terminal JOG priority	0	0: invalid 1: valid	When F13.25=1, in the running process, when any DI terminal function (F06.00 ～ F06.06) is set to 4 (forward jog) or 5 (reverse jog), the jog operation is valid immediately.

Parameter setting for jog running of MF key on the operation panel

Function code	Name	Factory default	Setting range	Parameter explain
F05.04	Functions of MF key	0	0: MF invalid 1: switch between keypad command and remote command 2: FWD/REV switch 3: FWD jog 4: REV jog	The forward jog is set to 3, and the reverse jog is set to 4.
F00.01	Run command channel	0	0: keypad run command channel (LED off) 1: terminal command channel (LED on) 2: 485 run comm1: terminal running command channel (LED on) and channel (LED flickering)	When jogging with the MF key, set it to 0.
F13.00	Jogging frequency	2.00Hz	0.00Hz～max frequencyF00.06	-
F13.01	Jogging running ACC time	20.0s	0.0～6500.0s	It refers to the time it takes for the inverter to accelerate from 0Hz to "Acceleration and deceleration time reference frequency F00.23".
F13.02	Jogging running DEC time	20.0s	0.0～6500.0s	Refers to the required time for the inverter to decelerate from "Acceleration and deceleration time reference frequency F00.23" to 0Hz "Acceleration and deceleration time reference frequency F00.23").时间。
F13.25	Terminal JOG priority	0	0: invalid 1: valid	When F13.25=1, in the running process,

				when any DI terminal function (F06.00～F06.06) is set to 4 (forward jog) or 5 (reverse jog), the jog operation is valid immediately.

Using the MF key to jog the operation method: when the inverter is stopped, press the MF key to enter the forward jog or reverse jog running state, press the MF key, the inverter will decelerate and stop.

5.6 Frequency detection technology(FDT)

Used to set the detection value of the output frequency and the hysteresis value of the output action release. Note that the hysteresis value is only valid during deceleration.

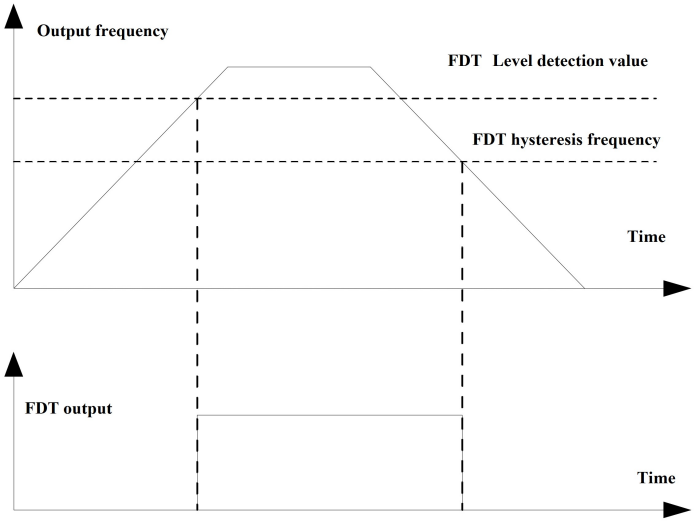


Figure 5-17 Relationship between output frequency and FDT output

The parameter settings are as follows:

Function code	Name	Default value	Setting range	Parameter explain
F13.17	Frequency detection value (FDT1)	50.00Hz	0.00Hz～max frequency F00.06	When the operating frequency is greater than the frequency detection value, the DO or relay outputs a valid signal; When the running frequency is less than the detection value minus the frequency detection hysteresis value, the DO or relay outputs an invalid signal.
F13.18	Frequency detection delay	5.0%	0.0%～100.0%(FDT1 level)	100% corresponds to the frequency detection

	value (FDT1)			value F13.17.
F13.26	Frequency detection value (FDT2)	50.00Hz	0.00Hz～max frequency F00.06	-
F13.27	Frequency detection hysteresis value (FDT2)	5.0%	0.0%～100.0%(FDT2 level)	-

5.7 Frequency arrival detection amplitude

It is used to set the detection range of frequency arrival. The parameter settings are as follows:

Function code	Name	Default value	Setting range	Parameter explain
F13.19	Frequency arrival detection amplitude	0.0%	0.0%～100.0%(max frequency F00.06)	100% corresponds to max frequency F00.06; when the running frequency is within the range of the set frequency ± the maximum frequency F00.06*F13.19 (frequency reaches the detection width), the DO or relay outputs a valid signal.

5.8 Any arrival detection frequency value

Function code	Name	Default value	Setting range	Parameter explain
F13.28	Any arrival detection frequency value 1	50.00Hz	0.00Hz～max frequency F00.06	When the running frequency of the inverter is within the range of the detection value of any arrival frequency ± the detection amplitude of any arrival frequency, the DO or relay outputs a valid signal.
F13.29	Frequency arrival detection amplitude1	0.0%	0.0%～100.0% (max frequency F00.06)	
F13.30	Any arrival detection frequency value 2	50.00Hz	0.00Hz～max frequency F00.06	-
F13.31	Any arrival detection frequency range 2	0.0%	0.0%～100.0% (max frequency F00.06)	-

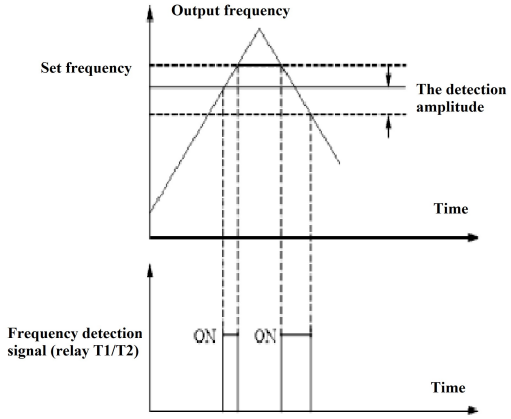


Figure 5-18 Schematic diagram of FDT level

5.9 0 current detection

Function code	Name	Default value	Setting range	Parameter explain
F13.32	0 current detection level	5.0%	0.0%～300.0%	When the output current of the inverter is less than or equal to the zero current detection level F13.32, and the duration exceeds the zero current detection delay time F13.33, the DO or relay outputs a valid signal.
F13.33	0 current detection delay time	0.10s	0.01～600.00s	

5.10 Output current over limit

Function code	Name	Default value	Setting range	Parameter explain
F13.34	Output current over limit	200.0%	0.0%：No-Check; 0.1%～300.0%	When the output current of the inverter is greater than or equal to the output current over limit F13.34, and the duration exceeds the output current over limit detection delay time F13.35, the DO or relay outputs a valid signal.
F13.35	Output current over limit detection delay time	0.00s	0.00～600.00s	

5.11 Power on arrive time

Function code	Name	Default value	Setting range	Parameter explain
F13.14	Set power on arrive time	0	0.0h～6500.0h	When cumulative power on time (F05.17) reaches the power-on time set by F13.14, the inverter DO or relay outputs a valid signal.

5.12 Any arrival current

Function code	Name	Default value	Setting range	Parameter explain
F13.36	Any arrival current 1	100.0 %	0.0%～300.0% (motor rated current)	When the output current of the inverter is within the range of (any arrival current 1 ± any arrival current 1 width) * the rated current of the motor, the DO or relay outputs a valid signal.
F13.37	Any arrival current 1range	0.0%	0.0%～300.0% (motor rated current)	
F13.38	Any arrival current 2	100.0 %	0.0%～300.0% (motor rated current)	-
F13.39	Any arrival current 2 range	0.0%	0.0%～300.0% (motor rated current)	-

5.13 Timing function

Every time the inverter starts, it starts timing from 0, and the remaining time of timing can be checked through b00.20.

Function code	Name	Default value	Setting range	Parameter explain
F13.40	Timing function selection	0	0: invalid 1: valid	When F13.40=1, the inverter starts timing when it starts, and when the timer running time (F13.42) is reached, the inverter automatically stops, and DO or relay outputs valid signals at the same time.
F13.41	Timer running time selection	0	0: F13.42 setting 1: AI1 2: AI2 3: reserved Analog input range corresponding to F13.42	When F13.41=1, timer running time=(AI1 voltage/10V)*F13.42. That is, 100% of the analog input range corresponds to F13.42.
F13.42	Timer running time	0.0	0.0min～6500.0min	The timing operation time is determined by F13.41 and F13.42.

5.14 Running arrive time

Function code	Name	Factory default	Setting range	Parameter explain
F13.15	Set running arrive time	0	0.0h～ 6500.0h	Used to set the running time of the inverter. When the cumulative running time (F05.15) of the inverter exceeds the set power on arrive time (F13.14), the DO or relay will output a valid signal.

CHAPTER 6 COMMUNICATION PROTOCOL

The CT100G&CT100E series inverters provide RS485 communication interface. You can realize centralized control via PC/PLC (set the run commands and function parameters of the inverter, read the work state and fault information of the inverter) to meet the specific requirements.

1. Content

The serial communication protocol defines the content and format of the transmission information for serial communication, including master polling (or broadcast) format, master encoding method including the required function codes, transmission data and error check. The slave response also uses the same structure including actuation confirmation, return data and error check. If an error occurs when the slave receives information or the slave cannot complete the actuation required by the master, it will feedback a response of fault information to the master.

2. Application mode

The inverter has access to "single- master multi-slaves" PC/PLC control network with RS485 bus.

Support Modbus protocol and RTU format; Broadcast address is 0 and slave address can be set to 1~247.

3. Bus structure

(1) interface mode

RS485 (terminals: 485 + and 485-) hardware interface

(2) transmission mode

Asynchronous serial, half duplex transmission. At the same time, only one can send data and the other can receive data for the master and the slave. Data in the serial asynchronous communication process, in the form of a message, can be sent one by one frame.

(3) topology structure

Single-master multi-slaves network, the slave address in the network must be unique.

4. Description of the protocol

Inverter communication protocol is an asynchronous serial master-slave Modbus communication protocol and only one device (master) in the network can establish a protocol (called "query/command"). Other devices (slaves) can only provide data to respond to the master's "query/command" or make the corresponding actuation according to the master's "query/command". The master refers to a personal computer (PC), an industrial control device or a programmable logic controller (PLC), etc. The slave is the inverter. The master can communicate with a single slave as well as send a broadcast message to all slaves. For the master’s single "query/command", the slave has to return a message (called a response), for the master’s broadcast message, the slaves do not need to respond to the master.

5.Communication data format

The Modbus protocol communication data format of CT100G&CT100E series inverters is as follows:

In RTU mode, the minimum interval time should be at least 3.5 bytes for message

transmission, which is the easiest way to achieve a variety of character time at the baud rate. The first transmitted field is the device address. The transmitted characters can be hexadecimal 0...9 and A...F. The network device constantly detects the network bus, even during the interval time. When the first field (address field) is received, the corresponding device decodes next transmitting character. After the last transmitting character, the interval time of at least 3.5 bytes marks the end of the message. A new message can start after this pause.

The whole message frame is a continuous transmitting flow. If there is an interval time of more than 1.5 bytes before the frame is completed, the receiving device will renew the uncompleted message and assume that the next byte is the address field of a new message. As such, if the new message follows the previous message within the interval time of 3.5 bytes, the receiving device will deal with it as the same with the previous message. If these two phenomena all happen during the transmission, the CRC will generate a fault message to respond to the sending devices.

RTU frame format

START	Interval time of 3.5 bytes
ADR	Communication address: 1～247
CMD	03: read slave parameters; 06: write slave parameters
DATA (N-1)	Function parameter address, function parameter number, function parameter value etc.
DATA (N-2)	
……	
DATA (0)	
CRC CHK low bit	Detection value: CRC
CRC CHK high bit	
END	Interval time of 3.5 bytes

CMD (command instruction) and DATA

Command code: 03H, read N words (at most 16 words can be read)

For example: the baud rate 19200bps, even check (E, 8,1) for RTU, read continuous two data from the inverter F06.19 with the slave address of 01.

Master command message

ADR	01H
CMD	03H
High bit of start address	F6H (Function code group)
Low bit of start address	13H (Function code bit)
High bit of register number	00H
Low bit of register number	02H
Low bit of CRC CHK	06H
High bit of CRC CHK	46H

Slave response message

ADR	01H
CMD	03H
The number of bytes	04H
High bit of F06.19 data	00H
Low bit of F06.19 data	00H
High bit of F06.20 data	03H
Low bit of F06.20 data	E8H
Low bit of CRC CHK	FAH
High bit of CRC CHK	8DH

Command code: 06H, write a word

For example: the baud rate 19200bps, even check (E, 8,1) for RTU, write 40.00Hz (communication without decimal point) (0FA0H) to F00.09H address of the inverter whose slave address is 02H, and change the keypad set frequency to 40.00Hz.

Master command message

ADR	02H
CMD	06H
High bit of F00.09 address	F0H (Function code group)
Low bit of F00.09 address	09H (Function code bit)
High bit of F00.09 data	0FH
Low bit of F00.09 data	A0H
Low bit of CRC CHK	6FH
High bit of CRC CHK	73H

Slave response message

ADR	02H
CMD	06H
High bit of F00.09 address	F0H (Function code group)
Low bit of F00.09 address	09H (Function code bit)
High bit of F00.09 data	0FH
Low bit of F00.09 data	A0H
Low bit of CRC CHK	6FH
High bit of CRC CHK	73H

Check mode-CRC (Cyclical Redundancy Check) check

The checkout uses RTU frame format. The frame includes the frame error detection field which is based on the CRC calculation method. The CRC field is two bytes including 16 figure binary values. It is added into the frame after calculated by transmitting device. The receiving device recalculates the CRC of the received frame and compares them with the value in the received CRC field. If the two CRC values are different, there is an error in the communication.

Using the RTU frame format, the message includes an error detection field based on the CRC method. The CRC field detects the contents of the entire message. The CRC field is two bytes and contains a 16-bit binary value. It is added to the message by the transmission device. The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field. If the two CRC values are not equal, the transmission has an error.

During CRC, 0*FFFF will be stored. And then, deal with the continuous 6-above bytes in the frame and the value in the register. Only the 8Bit data in every character is effective to CRC, while the start bit, the end and the odd and even check bit is ineffective.

The calculation of CRC applies the international standard CRC checkout principles. When you are editing CRC calculation, you can refer to the relative standard CRC calculation to write the required CRC calculation program.

Here provided a simple function of CRC calculation for the reference (programmed with C language)

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

```
while(data_length--)
   {
crc_value^=*data_value++;
for(i=0;i<8;i++)
      {
if(crc_value&0x0001)
crc_value=(crc_value>>1)^0xa001;
else
crc_value=crc_value>>1;
      }
   }
return(crc_value);
}
```

Fault message response

The slave uses functional code fields and fault addresses to indicate it is a normal response or some error occurs (named as objection response). For normal responses, the slave shows corresponding function codes, digital address or sub-function codes as the response. For objection responses, the slave returns a code which equals the normal code, but the first byte is logic 1.

For example: when the master sends a message to the slave, requiring it to read a group of address data of the inverter function codes, there will be following function codes:

0 0 0 0 0 0 1 1 (hexadecimal 03H)

For normal responses, the slave responds the same function codes, while for objection responses, it will return:

1 0 0 0 0 0 1 1 (hexadecimal 83H)

Besides the function codes modification for the objection fault, the slave will respond a byte of abnormal code which defines the error reason.

When the master receives the response for the objection, in a typical processing, it will send the message again or modify the corresponding order.

Error code and meaning

Modbus abnormal code		
Code	**Name**	**Meaning**
01H	Illegal command	The command from master cannot be executed. This command is only for new version and this version cannot realize. Slave is in fault state and cannot execute it.
02H	Illegal data address	Some of the operation addresses are invalid or not allowed to access. Especially the combination of the register and the transmitting bytes are invalid.
03H	Illegal value	When there are invalid data in the message framed received by slave. Note: This error code does not indicate the data value to write exceed the range, but indicate the message frame is an illegal frame.
06H	The slave is busy	Inverter is busy (EPPROM is in storage)
10H	Password error	The password written to the password check address is not the same as the password set by P7.00.
11H	Check error	In the frame message sent by the upper monitor, the length of the digital frame is incorrect or the counting of CRC check bit in RTU is different from the lower monitor.

12H	Invalid parameter change	It only happens in write command. The written data exceeds the parameter range. The parameter should not be modified now. The terminal has already been used.
13H	The system is locked	When the upper computer is reading or writing and the user password is set without password unlocking, it will report that the system is locked.

Address definition of communication parameters

It is used to control the inverter operation, inverter status and related parameter settings.

Read and write function parameters (some function codes cannot be changed, only for manufacturers to use):

The rules of parameter address of the function codes:

High byte: group number before the radix point of the function code (00～15) Group 0 to Group 15

Low byte: the number after the radix point (00～FF)

For example, the parameter address of F13.17 is FD11H.

Function code	Communication visit address(write EEPROM)	communication modify function code address in RAM
F00～F15 group	0xF000～0xFFFF	0x0000～0x0EFF
A00～A15 group	0xA000～0xAFFF	0x4000～0x4FFF
b00 group	0x7000～0x70FF	

Table 6-1 485 communication address

Function instruction	Address definition	Data meaning instruction	R/W characteristics
Communication control command	2000H	0001H: FWD	W/R
		0002H: REV	
		0003H: RWD JOG	
		0004H: REV JOG	
		0005H: free stop (emergency stop)	
		0006H: DEC to stop	
		0007H: fault reset	
		0008H: JOG stop	
Communication setting value address	2001H	Communication setting frequency (0~Fmax, unit is 0.01Hz)	W/R
	2002H	PID set value (0～1000,1000 corresponding to 100.0%)	
	2003H	PID feedback value (0～1000,1000 corresponding to 100.0%)	W/R
	2004H	Torque set (-2000～2000,1000 corresponding to 100.0%)	W/R
	200DH	AO output set 1 (0～1000,1000 corresponding to 100.0%)	W/R
	200EH	AO output set 2 (0～1000,1000 corresponding to 100.0%)	W/R

Function instruction	Address definition	Data meaning instruction	R/W characteristics
Inverter state	2100H	0001: FWD running state 0002: REV running state 0003: inverter stop state 0004: inverter fault state	R
Inverter fault code	2102H	See F08 group fault explain parameters	
The address of the running/stopping parameter	3000H	Running frequency (0～Fmax,unit0.01Hz)	R
	3001H	Setting frequency (0～Fmax,unit0.01Hz)	R
	3002H	Bus voltage(0～2000.0,unit0.1V)	R
	3003H	Output voltage(0～1200V,unit1V)	R
	3004H	Output current(0.0～3000.0,unit0.1A)	R
	3005H	Running speed (0～65535,unit1RPM)	R
	3006H	Output power(-300.0～300.0%,unit0.1%,100% corresponding to motor rated power)	R
	3007H	Output torque(-250.0～250.0%,unit0.1%,100% corresponding to motor rated torque)	R
	300AH	Digital input state(000～0FF,unit01H)	R
	300BH	Digital output state(000～0FF,unit01H)	R
	300CH	Analog input 1 value (0.00～10.00V,unit0.01V)	R
	300DH	Analog input 2 value (0.00～10.00V,unit0.01V)	R
	3010H	High speed pulse I input (0.00～50.00kHz,unit0.01kHz)	R
	3012H	PLC step, range 0~15	R
	3013H	External length, range 0~65535	R
	3014H	External count, range 0~65535	R
	3015H	Torque setting value, range -200.0~200.0%, unit 0.1%	R

Note: in the "**Data meaning instruction**" in the table above, the number values such as "10000", "1000" are decimal numbers, which need to be converted to hexadecimal in actual use.

CHAPTER 7 FAULT REASON AND SOLUTION

7.1 Normal fault and solution

The inverter may have following faults during running. Please refer to the following methods for simple fault analysis:

7.1.1 No display after power on

Check that the inverter input power is consistent with the rated voltage of the inverter. If there is a problem with the power supply, please check and remove.

Check whether the three-phase rectifier bridge is intact. If the rectifier bridge is damaged, please ask for service.

Check if the POWER LED is on. If the LED is off, the rectifier bridge or the buffer resistor may be damaged. If the LED is on, the switching power supply may be damaged. Please ask for service.

7.1.2 Automatic power off after power on:

Check whether there is grounded or short circuited among the input power sources.

Check whether the rectifier bridge has been broken down, if damaged, ask for service.

When the inverter runs, the power supply automatically trips; check the input leakage protector.

Check whether there is a short circuit between the output modules. If yes, please ask for service.

Check whether there is a short circuit or ground between the motor leads.

If the trip occasionally occurs and the distance between the motor and the inverter is relatively far, consider adding the output AC reactor.

7.1.3 The motor does not rotate after the inverter is running

Check whether there is a balanced three-phase output between U, V and W. If yes, the motor cable or the motor is damaged, or the motor stalled due to mechanical causes.

There may be three-phase output but unbalanced. The drive board or output module may be damaged, please ask for service.

If there is no output voltage, the drive board or output module may be damaged, please ask for service.

7.2 Fault information and solution

When the inverter has fault in use, refer to the fault codes and fault states of F08.16～F08.23.

Table7 -1 Troubleshooting list

Code	Type	Reason	Solution
E.oC1	ACC running overcurrent	1. The acceleration is too fast 2. The grid voltage is too low 3. The inverter power is too small	1. Increase the ACC time 2. Check the input power 3. Select the inverter of larger power
E.oC2	DEC running overcurrent	1. The deceleration is too fast 2. Load inertia torque is too large 3. The inverter power is too small	1. Increase the DEC time 2. Add the appropriate energy consumption braking components 3. Select the inverter of larger power
E.oC3	Constant speed running overcurrent	1. Load sudden change or abnormal 2. The grid voltage is too low 3. The inverter power is too small	1. Check load or decrease load sudden change 2. Check the input power 3. Select the inverter of larger power
E.oU1	ACC running overvoltage	1. The input voltage is abnormal 2. After instantaneous power failure, restart the rotating motor	1. Check the input power 2. Avoid restart at stop
E.oU2	DEC running overvoltage	1. The deceleration is too fast 2. The load inertia is too large 3. The input voltage is abnormal	1. Increase the DEC time 2. Add the appropriate energy consumption braking components 3. Check the input power
E.oU3	Constant speed running overvoltage	1. The input voltage has changed abnormally 2. The load inertia is too large	1. Install the input reactor 2. Add the appropriate energy consumption braking components
E.Lv	Bus undervoltage	The grid voltage is too low	Check the grid input power
E.oUT1	Converter unit U-phase fault	1. The acceleration is too fast 2. The internal IGBT is damaged 3. Interference causes malfunction 4. The grounding is good	1. Increase the ACC time 2. Ask for service 3. Check if the peripheral devices have a strong interference source
E.oUT2	Converter unit V-phase fault		
E.oUT3	Converter unit W-phase fault		
E.oL1	Motor overload	1. The grid voltage is too low 2. The motor rated current is not set correctly	1. Check the grid voltage 2. Reset the motor rated current 3. Check the load and adjust

Code	Type	Reason	Solution
		3. Motor stall or load sudden change 4. Motor power is much larger than load power	the torque boost 4. Select the appropriate motor
E.oL2	Inverter overload	1. The acceleration is too fast 2. Restart the rotating motor 3. The grid voltage is too low 4. The load is too large	1. Reduce the acceleration speed 2. Avoid restart at stop 3. Check the grid voltage 4. Select the inverter of larger power
E.oL3	Overload pre-warning	1. The load is too heavy 2. The motor parameters are not correct during vector control 3. The grid voltage is too low	1. Select a larger inverter 2. Carry out motor rotation autotuning 3. Check the grid voltage
E.oH1	Rectifier module overheating	1. Instantaneous overcurrent of the inverter 2. Phase or ground short circuit of output three phases 3. The duct is blocked or the fan is damaged 4. The ambient temperature is too high 5. The wiring or connectors of the control board is loose 6. The auxiliary power supply is damaged and the drive voltage is undervoltage 7. The power module bridge is conducted 8. The control board is abnormal	1. Refer to overcurrent solutions 2. Redistribution 3. Dredge the duct or replace the fan 4. Reduce the ambient temperature 5. Check and reconnect 6. Ask for service 7. Ask for service 8. Ask for service
E.oH2	Converter module overheating		
E.ILF	Input phase loss	Input R, S, T phase loss	1. Check the input power 2. Check the installation and wiring
E.OLF	Output phase loss	1. Output U, V, W phase loss 2. Serious asymmetry of load three-phase	1. Check the output wiring 2. Check the motor and cable
E.bC	Braking unit fault	1. Braking wiring fault or braking tube damaged 2. The external braking resistance is too small	1. Check the braking unit and replace a new braking tube 2. Increase the braking resistance

Code	Type	Reason	Solution
E.AUT	Motor autotuning fault	1. The motor capacity does not match with the inverter capacity 2. Incorrect setting of motor rating parameters 3. The deviation between autotuning parameters and standard parameters is too large 4. Autotuning timeout	1. Replace the drive model 2. Set the rated parameters according to the motor name plate 3. Make the motor at no load and re-identification 4. Check the motor wiring and parameters setting
E.PIDE	PID feedback disconnection	1.PID feedback disconnection 2.PID feedback source disappears	1. Check the PID feedback signal cable 2. Check the PID feedback source
E.485	Communication fault	1. Incorrect baud rate setting 2. Communication error when using serial communication 3. Communication interruption for a long time	1. Set the appropriate baud rate 2. Press the STOP/RESET key to reset and ask for service 3. Check the wiring of communication interfaces
E.EF	External fault	SI external fault input terminal operation	1. Check the external device input
E.EEP	EEPROM read and write fault	1. Control parameters read and write error 2.EEPROM damaged	1. Press the STOP/RESET key to reset and ask for service 2. Ask for service
E.END	Running time arrival	User trial time arrival	Ask for service
E.ITE	Current detection circuit fault	1. The connector of the control board is in poor connection 2. The auxiliary power supply is damaged 3. Hall device is damaged 4. Amplifier circuit is abnormal	1. Check the connector and reconnect 2. Ask for service 3. Ask for service 4. Ask for service

Tips: If you cannot perform troubleshooting according to the above solutions, please contact our after-sales service department.

CHAPTER 8 DAILY MAINTAINING

The environmental temperature, humidity, salt mist, dust, cotton or vibration may cause the faults of the inverter. In order to prevent the faults of the inverter and make it run smoothly in high-performance for a long time, you must check the inverter periodically.

Note:The maintenance personnel must follow the specified maintenance methods.

Only qualified technicians can carry out maintenance.

During maintenance, the power supply of the inverter must be cut off, the power LED is off or the DC bus voltage is less than 36VDC.

8.1 Daily maintaining

Table 8-1 Daily maintenance

Check item	Check content	Method	Criterion
Environment	Temperature	Thermometer	-10℃～50℃
	Humidity	Hygrometer	5%～95%, no condensation
	Dust, cotton, oil	See	No dust or cotton
	Vibration	Feel	No abnormal vibration
Inverter	Noise	Hear	No abnormal noise
	Odor	Smell	Odorless
	Appearance	See	No defect or deformation
	Temperature	Feel	No abnormal heating
	Fan	See	Air duct without block, normal air flow and no noise
Motor	Temperature	Feel	No abnormal heating
	Odor	Smell	odorless
	Noise	Hear	No abnormal noise
	Vibration	Feel	No abnormal vibration
Running status parameters	Inverter input current	Ammeter	The parameters meet the requirements of the specifications.
	Inverter input voltage	Voltmeter	
	Inverter output current	Ammeter or displayed parameters	
	Inverter output voltage	Voltmeter or displayed parameters	
	Rectifier bridge, converter module temperature	F05.13 and F05.14	The difference between displayed temperature and ambient temperature is not more than 40℃.

8.2 Periodic maintaining

Table 8-2 Periodic (three months) maintenance

Check item	Check content	Method
Control terminal screws	Whether the screws are loose	Tighten
Main circuit terminal screws	Whether the screws are loose	Tighten
Grounding terminal screws	Whether the screws are loose	Tighten
PCB board	Dust or sundries	Clean up sundries with dry compressed air
Fan	Abnormal noise and vibration, the cumulative time is more than 20,000 hours	1. Clean up sundries 2. Replace the fan
Electrolytic capacitor	Whether to change color, with or without smell	Replace the electrolytic capacitor
Radiator	Dust or sundries	Clean up sundries with dry compressed air
Power components	Dust or sundries	Clean up sundries with dry compressed air

8.3 Replacement of wear parts

The inverter fan and electrolytic capacitor are easy to be damaged. In order to ensure the inverter runs safely without faults for a long term, you need to replace the wear parts periodically. The replacement time for wear parts is as follows:

- Fan: it needs to be replaced after using more than 20,000 hours
- Electrolytic capacitor: it needs to be replaced after using 30,000 to 40,000 hours

8.4 Storage of inverter

The storage environment should meet the following conditions:

Table 8-3 Storage environment

Category	Storage environment
Temperature	-40℃～70℃
Humidity	5%～95%, no condensation
Surroundings	No direct sunlight, dust, corrosive gases or vibration (can be sealed with plastic bags and desiccant)

Note: Long-term storage may cause electrolytic capacitor degradation. The electrolytic capacitor should be energized once in 2 years and the rated voltage should rise slowly by the regulator

WARRANTY CARD & QC CERTIFICATION

User File	User Name：	Contact person：
	Address:	Telephone：
Product File	Model number：	
	Post code：	
	Dealer Company：	
Fault information	Application of environment：	
Maintenance situation describe	Maintenance man： YY/MM/DD:	
Purchase date:	Handling person ： YY/MM/DD:	

Note:Warranty is only valid for products manufactured, sold, and used in China's mainland.

Product Certification

Product Name: _____

Product standard: _____

Product number: _____

Release date: _____

Inspector: _____