



微信公众平台：海利普变频器



# HLP-SK180 Series Operating Manual





# HLP-SK180 Series Operating Manual





## Introduction

Thank you for purchasing and using the general-purpose inverter of HLP-SK180 series of multi-functions and high performance.

Please read carefully the operation manual before putting the inverter to use so as to correctly install and operate the inverter, give full play to its functions and ensure the safety. Please keep the operation manual handy for future reference, maintenance, inspection and repair.

Due to the inverter of a kind of power electronics product it must be installed, tested and adjusted with specialized electrical engineering workers.

The marks of  (Danger) ,  (Caution) and other symbols in the manual remind you of the safety and prevention cautions during the handling, installation, running and inspection. Please follow these instructions to make sure the safe use of the inverter. In case of any doubt please contact our local agent for consultation. Our professional persons are willing and ready to serve you.

The manual is subject to change without notice.



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## Chapter 1 Safty Precautions



**Caution** Indicates misuse may damage the inverter or mechanical system .



**Danger** Misuse may result in casualty.

### 1.1 Before power-up

#### Caution

- Check to be sure that the voltage of the main circuit AC power supply matches the input voltage of the inverter.
- Install the inverter in a safe location, avoiding high temperature, direct sunlight, humid air or water.
- The inverter can only be used at the places accredited by our company. Any unauthorized working environment may have the risks of fire, gas explosion, electric shock and other incidents.
- If more than one drive installed on the same control cabinet, make additional cooling fan, so that the inside temperature is lower than 40 in order to prevent overheating or fire occurs.
- It will affect the service life of the inverter if a contactor is installed on the input side to control the start and stop. Generally it is required to control it through terminal commands. Special attention should be paid to its use in the case of the start and stop more frequently places.
- Do not install any switch component like circuit breaker or contactor at the output of the inverter. If any of such components must be installed due process and other needs, it must be ensured that the inverter has no output when the switch acts. In addition, it is forbidden to install any capacitor for improvement of power factor or any varistor against thunder at the output. Otherwise it will cause malfunctions, tripping protection and damages of components of the inverter.
- Please use an independent power supply for the inverter. Do avoid using the common power supply with an electrical welder and other equipment with strong disturbance. Otherwise it will cause the drive to protect or even damage the drive.
- Motor overload protection is not included in the default settings. If this function is desired,, set C01.09(motor thermal protection) to date value ETR trip or date value ETR warning.




- Do not make any high voltage test with any component inside the inverter. These semi-conductor parts are subject to the damage of high voltage.
- The IC board of the inverter are susceptible to the effect and damage of static electricity. Don't touch the main circuit board.
- Installation, commissioning and maintenance must be performed by qualified professional personnel.
- Don't carry the front cover of the inverter directly when handling. It should be handled with the base to prevent the front cover off and avoid the dropping of the inverter, which may possibly cause the injuries to people and the damages to the inverter.

 **Danger**


- Be sure to turn off the power supply before wiring.
- Mount the drive in the metal and other non-combustible materials to avoid the risk of fire.
- Don't install the drive in a space with explosive gas, otherwise, they lead to explosion.
- R, S, T terminals are power input terminals, never mixed with U.V.W terminals. Be sure that the wiring of the main circuit is correct. Otherwise it will cause damages of the inverter when the power is applied to it.
- The terminal of ⊕ must be grounded separately and never connected to N-line. Otherwise it will easily cause the protection or errors of the inverter.
- Do not disassemble or modify any internal connecting cord, wiring or component of the inverter by yourself.
- Never remodel it or exchange control boards and components by yourself. It may expose you to an electrical shock or explosion, etc.
- Keep the inverter from the reach of children or persons not concerned.

## 1.2 During the power-up

 **Danger**

- Do not plug the connectors of the inverter during the power up to avoid any surge into the main control board due to plugging, which might cause the damage of the inverter.
- Always have the protective cover in place before the power up to avoid electrical shock injury.

### 1.3 During the operation


 **Caution**

- Do not measure the signals on circuit boards while the inverter is running to avoid danger.
- The drive has been optimized before sold. Please make proper adjustments according to the desired functions.
- Do consider the vibration, noise and the speed limit of the motor bearings and the mechanical devices.

 **Danger**

- Never connect or disconnect the motor set while the inverter is in running. Otherwise it will cause over-current trip and even burn up the main circuit of the inverter.
- Never remove the front cover of the inverter while the inverter is powered up to avoid any injury of electric shock.
- Do not come close to the machine when the Reset Function is used to avoid anything unexpected. The motor may automatically recover from fault.

### 1.4 After the power-off

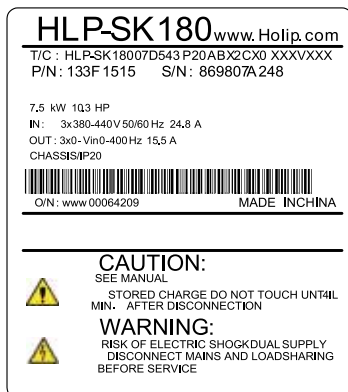
 **Caution**

- Even in the case of the main power, the other voltage inputs and the share load (linkage of DC intermediate circuit) all have been disconnected from the mains, the internal of the drive may still have residual energy. Before touching any potentially live parts of the inverter, please wait at least 4 minutes for the drives of less than 7.5KW (including 7.5KW), and wait at least 15 minutes for the drive between 11KW and 22KW. Otherwise, it may expose you to a risk of electrical shock.

The user must strictly follow the instruction to operate and make wire connection. Otherwise HOLIP will not responsible for the damages due to wrong operation. The user will responsible for the damages themselves.

## Chapter 2 Standards and Specifications

### 2.1 Nameplate Description



### Significance of the type code:

**T/C: HLP-SK180 07 D543 P20 ABX2 CX0 XXXVXXX**

	1-9	10-12	13-14	15 -18	19-21	22 23	24 25	26-28	29-32
1-9	HLP-SK180								
10-12	07D5								
13-14	21								
	31								
	43								
15-18	P20								
19-21	ABX								
22	X								
	1								
	2								
23	C								
24	x								
25	0								
	1								
26-28	XXX								
29-32	VXXX								

## 2.2 Particular Specifications

Model	Input voltage	Input current/ A	Output current/ A	Rated power/ KW	Suitable motor/ KW	Net weight/ KG
HLP-SK18007D543	3×380-440V50/60HZ	248	155	7.5	7.5	3.52
	3×440-480V50/60HZ	214	14.0			
HLP-SK180001I43	3×380-440V50/60HZ	330	230	11	11	5.92
	3×440-480V50/60HZ	290	21.0			
HLP-SK180001543	3×380-440V50/60HZ	42.0	31.0	15	15	5.92
	3×440-480V50/60HZ	36.0	27.0			
HLP-SK18018D543	3×380-440V50/60HZ	34.7	37.0	18.5	18.5	9.94
	3×440-480V50/60HZ	31.5	34.0			
HLP-SK180002243	3×380-440V50/60HZ	41.2	43.0	22	22	9.94
	3×440-480V50/60HZ	37.5	40.0			
HLP-SK180003043	3×380-440V50/60HZ	57	61	30	30	25.4
	3×440-480V50/60HZ	49	52			
HLP-SK180003743	3×380-440V50/60HZ	70	73	37	37	25.4
	3×440-480V50/60HZ	61	65			
HLP-SK180004543	3×380-440V50/60HZ	84	90	45	45	50
	3×440-480V50/60HZ	73	80			
HLP-SK180005543	3×380-440V50/60HZ	103	106	55	55	50
	3×440-480V50/60HZ	89	105			
HLP-SK180007543	3×380-440V50/60HZ	140	147	75	75	50
	3×440-480V50/60HZ	121	130			
HLP-SK180009043	3×380-440V50/60HZ	175	180	90	90	60
	3×440-480V50/60HZ	154	160			
HLP-SK180011043	3×380-440V50/60HZ	206	215	110	110	60
	3×440-480V50/60HZ	183	190			
HLP-SK180013243	3×380-440V50/60HZ	251	260	132	132	60
	3×440-480V50/60HZ	231	240			
HLP-SK180016043	3×380-440V50/60HZ	304	315	160	160	99
	3×440-480V50/60HZ	291	302			
HLP-SK180018543	3×380-440V50/60HZ	350	365	185	185	99
	3×440-480V50/60HZ	320	335			
HLP-SK1800020043	3×380-440V50/60HZ	381	395	200	200	99
	3×440-480V50/60HZ	348	361			
HLP-SK180022043	3×380-440V50/60HZ	420	435	220	220	99
	3×440-480V50/60HZ	383	398			

## 2.3 Technical Specifications

Item	Specification	
Power supply	Supply voltage	Single/Three phase 200-240 V $\pm 10\%$ ; Three phase 380-480 V $\pm 10\%$ ;
	Frequency	48-62Hz;
	Max. imbalance	3%;
Motor output	Output voltage	Three phase 0-100% of supply voltage;
	Output frequency	V/F : 0-400Hz , VVC $\pm$ : 0-200Hz;
Main control functions	Control mode	V/F, VVC $\pm$ ;
	Start torque	0.5Hz 150%;
	Overload capacity	150% rated output current (60s), 180% rated output current(1s);
	PWM switch frequency	2K-16KHz;
	Speed setting resolution	Digital: 0.001Hz ; analog: 0.5‰ of the max. operating frequency ;
	Speed open-loop control accuracy	30 - 4000 rpm: error $\pm 8$ rpm;
	Speed closed-loop control accuracy	0 - 6000 rpm: error $\pm 0.15$ rpm;
	Control command source	LCP , digital terminal, local bus;
	Frequency setting source	LCP , Analog, impulse, local bus;
	Ramp time	4 group ramp times 0.05-3600.00s;
Basic Functions	AMA Function; Motor Pre-excitation; Slip Compensation; Torque compensation; Automatic Voltage Regulation; V/F Control, DC Brake; AC brake; Speed Limit; Current Limit; Flying Start; Automatic Reset and Restart; Counter; Timer; Internal PI Controller.	
Application Functions	Speed Open-loop Process Closed-loop Control; Jogging ; Multi-speed Internal Control; Multi-speed External Control; SLC(including Order Control , Parallel Control); Mechanical Braking; UP/DOWN ; Catch up /Slow down; Relative proportional setting etc.	

Item	Specification		
Protection Functions	Missing Motor Phase Protection; Low-voltage Protection; Over-voltage Protection; Over-current Protection; Output Phase Loss Protection; Output Short Circuit Protection; Output Grounding Fault Protection; Motor Thermal Protection; Live Zero Timeout Function; AMA Fails; CPU Fault; EEPROM Faults; Button freeze; Duplicate Fails; LCP Invalid; LCP Incompatible; Parameter Read-only; Value Out of Range; Unable to execute during running; Password Error etc.		
Control Terminals	Digital input	Number	6 digital inputs, up to 39 different feature selections;
		Scanning time	1ms;
	Analog input	Number of input	2 analog inputs(VI, AI), both can receive voltage or current signals.
		Input accuracy	Max.error: 0.5% of full scale
		Resolution	11bit;
		Scanning time	1ms;
	Pulse input	Input number	1 pulse input(DI4), pulse range:20HZ-50HZ;
		Input accuracy	Max.error:0.5% of full scale;
		Resolution	11bit;
		Scanning time	16ms;
	Digital output	Output number	2 digital outputs(DO1, DO2), up to 67 different feature selections;
		Relay output	2 relay outputs(KA-KB, FA-FB-FC), up to 67 different feature selections;
Scanning time		1ms;	

Item		Specification	
Control Terminals	Analog output	Output number	2 analog outputs(VO, AO), VO can output voltage signals as well as current signals, AO can only output current signals, up to 11 different feature selections;
		Output accuracy	Max. error: 4‰ of full scale;
		Resolution	11bit;
		Scanning time	16ms;
	Pulse output	Output number	1 impulse output(DOI), up to 12 status display;
		Output accuracy	Max.error: 0.5‰ of full scale;
		Resolution	11bit;
		Scanning time	16ms;
	Power supply	VDD	24VDC power supply;
		+10V	10VDC power supply;
	RS485 serial communication	Terminal number	1, RS+(TX+,RX+), RS-(TX-,RX-);
Ground for RS485		COM;	
Display	8 segments, 5 numeric displays	Display frequency, warnings, status and so on;	
	Indicator	Light FWD, REV, HZ, A, R/MIN display various status of the inverter;	
	Monitoring	Frequency setting, output frequency, feedback value, output current, DC link voltage, output voltage, output power, input terminals state, output terminals state, analogue input , analogue output, I-O fault records and accumulated working time etc;	

Item		Specification
Accessory	Remote mounting kit for LCP	Available when the control panel for external use;
	Copy card	Copy parameters from one inverter to another ;
Environment	Enclosure	IP20;
	Ambient temperature	-10 -40 ;
	Humidity	5%-85%(95% without condensation);
	Vibration test	114g;
	Max. altitude above sea level	1000m, derating use when more than 1000 meters;
	Motor cable length	Shield cable: 5 meters, unshield cable: 50 metres;

Attention : Inverter under special environment (derating):

- Derating for ambient temperature: If the frequency converter is operated over 40 °C ambient temperature, the continuous output current should be decreased. The frequency converter has been designed for operation at max 50 °C ambient temperature with one motor size smaller than normal. Continuous operation at full load at 50 °C ambient temperature will reduce the lifetime of the frequency converter.
- Derating for low air pressure: The cooling capability of air is decreased at low air pressure. Below 1000m altitude no de-rating is necessary but above 1000m the ambient temperature or the maximum output current should be decreased. Decrease the output by 1% per 100m altitude above 1000m or reduce the max. ambient temperature by 1 degree per 200m.



## Chapter 3 Installation and wiring

### 3.1 Checks before Installation

The inverter has been strictly and well packed before sold. In consideration of various factors during the transportation special attention should be paid to the following points before the assembly and installation. If there is anything abnormal please notify the dealer or the relevant people of our company.

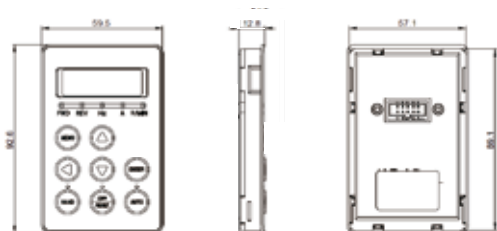
- Check if the inverter has got any damage or deformation during the transportation and handling;
- Check if there is one piece of HLP-SK180 series inverter and one copy of the instruction manual available when unpacking it;
- Check the information on the nameplate to see if the specifications meet your order (Operating voltage and KW value);
- Check if the optional components you ordered are contained;
- Check if there is a certificate of qualification and a warranty card.

### 3.2 Installation Dimensions

#### 3.2.1 Dimensions of LCP

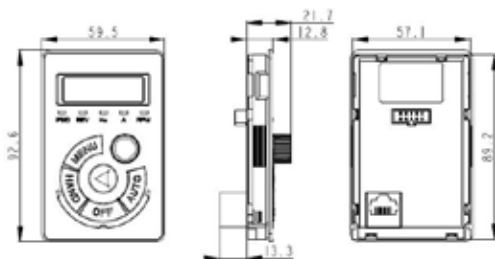
There are two kinds of LCP, mounting dimensions of the LCP are as shown in the following illustrations (unit: mm);

LCP 1 dimensions:



below 90kw

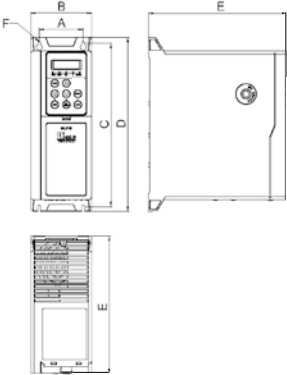
LCP 2 dimensions:

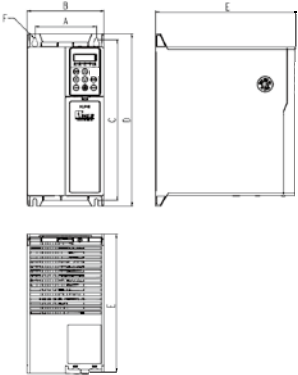
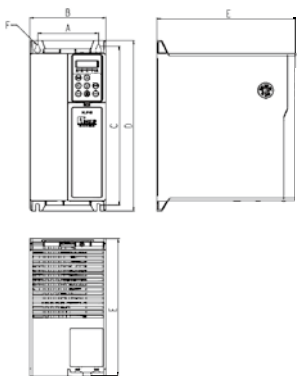


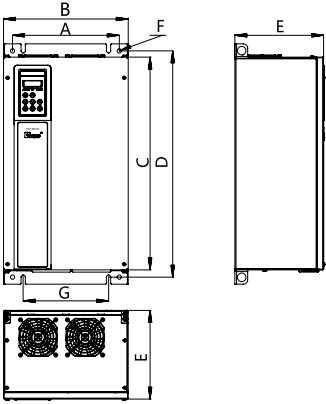
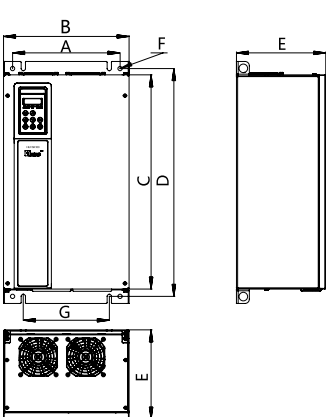
Upper 75kw

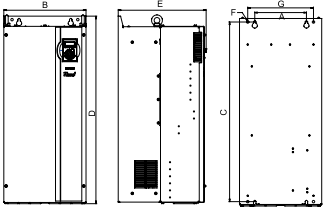
### 3.2.2 Dimensions of the inverter

Shapes of the inverter:

Item	Model	Shape and Installation Dimension
SK2	HLP-SK18007D543	

Item	Model	Shape and Installation Dimension
SK3	HLP-SK180001143 HLP-SK180001543	
SK4	HLP-SK18018D543 HLP-SK180002243	

Item	Model	Shape and Installation Dimension
SK5	HLP-SK180003043 HLP-SK180003743	 <p>Technical drawing of the SK5 unit. The front view shows a control panel on the left side. Dimensions are labeled: A (inner width), B (outer width), C (inner height), D (outer height), E (depth), F (top flange thickness), and G (bottom flange width). The side view shows the depth E. The rear view shows two fans and the depth E.</p>
SK6	HLP-SK180004543 HLP-SK180005543 HLP-SK180007543	 <p>Technical drawing of the SK6 unit. The front view shows a control panel on the left side. Dimensions are labeled: A (inner width), B (outer width), C (inner height), D (outer height), E (depth), F (top flange thickness), and G (bottom flange width). The side view shows the depth E. The rear view shows two fans and the depth E.</p>

Item	Model	Shape and Installation Dimension
SK7	HLP-SK180009043 HLP-SK180011043 HLP-SK180013243	
SK8	HLP-SK180016043 HLP-SK180018543 HLP-SK180020043 HLP-SK180022043	

Installation dimensions of the inverter:

TYPE	DIMENSIONS						
	A(MM)	B(MM)	C(MM)	D(MM)	E(MM)	F(MM)	
SK2	65	90	241	255	210	4.5	
SK3	91	125	275	295	260	5.5	
SK4	120	150	313	335	262	7	
TYPE	DIMENSIONS						
	A(MM)	B(MM)	C(MM)	D(MM)	E(MM)	F(MM)	G(MM)
SK5	250	292	500	530	210	10	200
SK6	280	330	630	680	300	10.5	215
SK7	220	350	765	799	375	10.5	280
SK8	345	486	863	900	390	10.5	410

### 3.3 Installation and Wiring

#### 3.3.1 Electrical Installation in General

#### Caution

- All cabling must comply with national and local regulations on cable cross-sections and ambient temperature. Copper conductors required, and ambient temperature(60-75 ) recommended.

Details of terminal tightening torques :

Power(KW)and Voltage levels			Torque(Nm)		
3×380-480V	Line	Motor	DC connection/ Brake	Control terminals	Relay
7.5	14	0.8	0.8	0.15-0.4	0.4
11-15	12	1.2	1.2	0.15-0.4	0.4
18.5	12	1.2	1.2	0.15-0.4	0.4
22	12	1.2	1.2	0.15-0.4	0.4

### 3.3.2 Fuse Specifications

Model	Fuse size (Rated current/A)
HLP-SK18007D543	40
HLP-SK180001143	63
HLP-SK180001543	63
HLP-SK18018D543	63
HLP-SK180002243	63

### 3.3.3 Installation and Direction

#### Single Installation

The inverter must be installed vertically with smooth ventilation. Enough space must be left around the inverter to ensure good cooling, as shown below:



Fig1 Single installation

#### Side by Side Installation

HLP-SK180series inverter can be mounted side by side, a minimum space must be reserved above and below the enclosure, as shown



### Upper and Lower Installation

If several inverters need to be installed together in one cabinet, upper and lower installation can be adopted. Enough space must be reserved to ensure effective cooling, as shown right:

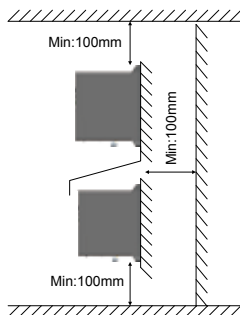
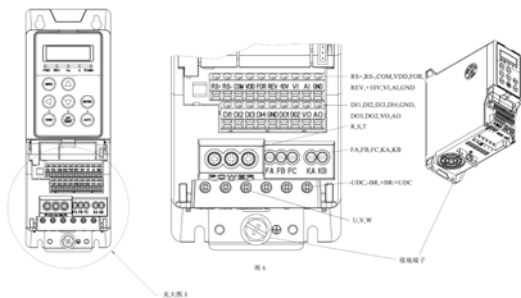


Fig. 3 Upper and Lower installation

**Note:** Install the unit and make sure that it is free from high moisture、high temperature、heavy dust、more metal fragments and high oil mist.

### 3.3.4 Wiring terminal













**Note:** SK3、SK4 frequency converter and SK2 frequency converter ground terminals have different positions.

### 3.3.4.1 Main Circuit Terminals

Terminals of the main circuit:


22KW及以下:

R	S	T					
							
-UDC	-BR	+BR/ +UDC	U	V	W		
							

30KW 及以上:




















R	S	T	+UDC	-UDC	U	V	W
---	---	---	------	------	---	---	---

Description of main circuit terminals:

Symbol	Function
R、S、T	Power input: 380V class Three phase 380-480V50/60Hz
U、V、W	Power output,connect to the motor
-BR、+BR	Connect the brake resistor, make sure to set C02.10、C02.11 etc.
+UDC、-UDC	Connector for DC reactor
	Ground terminal






### 3.3.4.2 I/O Control Terminals

Control terminals:

RS+	RS-	COM	VDD	FOR	REV	+10V	VI	AI	GND
									
	DI1	DI2	DI3	DI4	GND	DO1	DO2	VO	AO
									



## Control terminals

FA	FB	FC	KA	KB
				

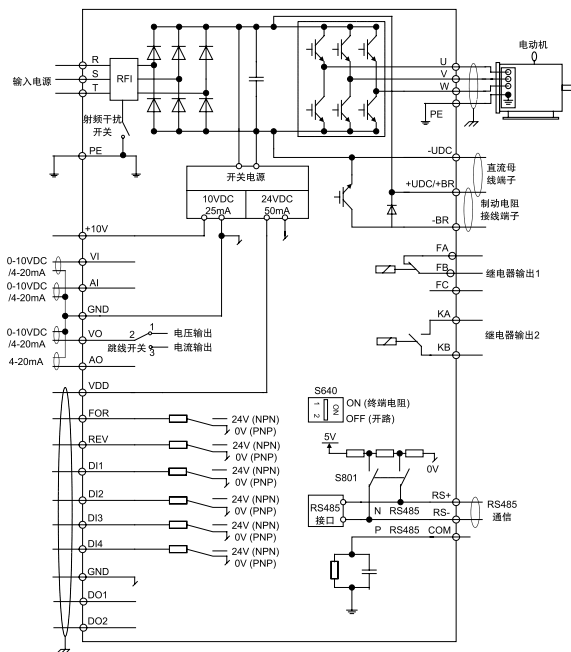
## Description of I/O control terminals :

Symbol	Description	Specification
VDD	24V Power supply	Max.load 50ma,have over load and short circuit protection functions;
10V	10V Power supply	Max.load 25 ma,have over load and short circuit protection functions;
Digital input ( For, DI1,DI2, DI3,DI4 )	Digital control terminals	<p>1, logic:            pnp &lt;dc5v logic '0';                &gt;dc10v logic '1';            npn &gt;dc19v logic '0';                &lt;dc14v logic '1';</p> <p>2, voltage: dc 0-24v;            3, input resistance: 4k<math>\omega</math>;            4, input voltage rang: max <math>\pm</math>28v; when the voltage is <math>\pm</math>37v may bear 10 seconds.            5, when di4 is defined as the motor thermal protection signal, ptc resistance:            - fault : &gt;29 k<math>\omega</math>;            - normal: &lt;800<math>\omega</math>;</p>
Analog input (VI, AI)	Analog setting/ feedback	<p>setted by the related parameter, analog input channel can be configurated to 0-20ma or 0-10v :</p> <p>voltage input            1, input impedance: about 10 k<math>\omega</math>;            2, maximum withstand voltage is 20v, duration of 2 seconds, the maximum reverse voltage is -15v, duration of 2seconds.</p> <p>current input:            1, input impedance<math>\leq</math>500<math>\omega</math>;            2, maximum withstand current is 29 ma duration of 2 seconds.</p>

Symbol	Description	Specification
Pulse input DI4	Pulse setting/ feedback	1、Pulse input: 0.020-50.000Khz; 2、Voltage range: $24v \pm 20\%$ ; 3、Input duty ratio: 40%-60%;
Digital output (DOI, DO2)	Digital output	1、Output voltage range: 0-24v; 2、Output current range: 0-50ma; 3、Max. Resistant load: 600 $\omega$ ; 4、The software is configured to pnp or npn output.
Analog output (VO, AO)	Analog output	Vo is selected to the current output or voltage output via jumper switch in the control board. Ao can only be selected as current output: 1、Output mode: 0-20ma or 0-10v; 2、Voltage output: load larger than 500 $\omega$ ; 3、Current output: load larger than 500 $\omega$ ;
Pulse output DOI	Pulse output	DOI can also be configured as pulse output channels: 1、Pulse output range: 0.020-50.000Khz; 2、Voltage range: 0-24v; 3、Duty ratio: 40%-60%; 4、Resistive load >1k $\omega$ , capacitive load < 10nf;
Gnd	Digital or analog ground	Isolated from internal com;
Relay output (K A-KB, FA- FB-FC)	Relay output	1、Resistive load: 250vac 3a/30vdc 3a; 2、Inductive load: 250vac 0.2A/24vdc 0.1A(cos $\phi$ =0.4);
Rs485	Rs485 communication	485 + And 485- ;
com	ground for communication	isolated from internal gnd;

### 3.3.5 Wiring

Basic Connection Diagram of HLP-SK180 series inverter:



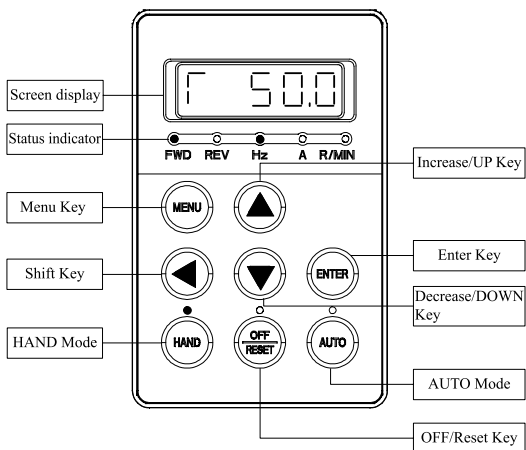
#### Precautions for the main circuit wiring:

- While wiring the sizes and specifications of wires should be selected and the wiring should be executed according to the electrical engineering regulations to ensure the safety.
- It is better to use shielded wire or wire conduit for power cord and ground the shielded layer or two ends of wire conduit.
- Be sure to install a circuit Breaker between the power supply and the input terminals (R,S,T). (If using RCD, please choose B type)
- Phase-shifting capacitors, LC, RC noise filters etc, can never be connected to the output terminals of the inverter.
- Please lower the inverter switching frequency when there is a longer distance between the inverter and the motor.

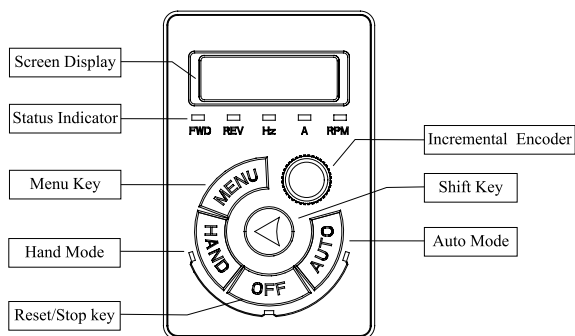
- Drive earth leakage current is greater more than 35 mA. According to the requirments of IEC 61800-5-1 , must use the following ways to enhance the protection of ground: minimum 10mm<sup>2</sup> cross sectional area of copper, or additional PE line, its cross sectional area and the main power cable should be the same, must be separate grounded.
- Make sure reliable ground of the inverter in accordance with IEC 61800-5-1.
- Please refer to 9.2 for the use of RFI SWITCH.

## Chapter 4 Operation and Display Interface

### 4.1 LCP Digital Operator



LCP1(Below 90kw)































LCP2(Upper 75kw)

The function of   and  is same with the function of 

## 4.2 Quick to set parameters







### 4.2.1 Preset reference by LCP

Example: Set a reference to 0.25, that is C0310[0]=20.5

Key-press	LCP Display	Action Description
	C00.03	Press  key to display the first basic C00.03
 	C03.00	Press   key to select parameter group C03
	C03.00	Press  key to shift to fractional part
 	C03.10	Press   key to select parameter C03.10
	[0]	Press  key show the first option of C03.10
	0000	Press  key to show the value of the first option of parameter C03.10
 	000.5	Press   key to change the fractional part to 5
	000.5	Press  key to shift to integral part
 	020.5	Press   key to change the integral part to 20
	END	Press  key to accept the change and save it as 20.5

#### 4.2.2 FWD/REV Status

Confirm the direction of the motor according to the set value, as shown in the following table:





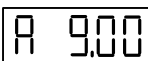

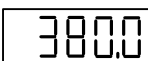

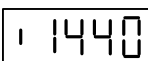

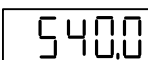

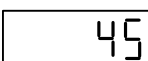


Reference	Running status	Indicator Display
$\geq 0$	STOP	 FWD REV
$< 0$	STOP	 FWD REV
$\geq 0$	FWD	 FWD REV
$\geq 0$	REV	 FWD REV
$< 0$	FWD	 FWD REV
$< 0$	REV	 FWD REV

**Note:** A flash light denotes the status coming, Light on indicates the current state, and light off means not in this state.






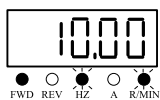

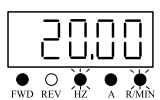

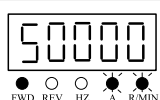

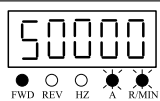
**Example 1:** The first line of the table indicates the drive is stop and the reference is greater than or equal to 0, means the drive at some time in the future will run forward.


**Example 2:** The fourth line of the table represents the current drive is reverse running, and the reference setting is greater than or equal to 0, it means the drive at some time in the future will run forward.

### 4.2.3 Monitoring

Display Items	Key-press	LCP Display	Action Description
Output Frequency	Initial interface	 ● ○ ● ○ ○ FWD REV HZ A R/MIN	Monitoring the output frequency (Cl6.13) to 50.0Hz, display accuracy : 0.1
Reference (%)		 ● ○ ● ● ○ FWD REV HZ A R/MIN	Monitoring the preset reference ( Cl6.01) to 50%, display accuracy: 0.001
Motor Current		 ● ○ ○ ● ○ FWD REV HZ A R/MIN	Monitoring the motor current (Cl6.14) is 900A, display accuracy: 0.01
Motor Voltage		 ● ○ ● ○ ● FWD REV HZ A R/MIN	Monitoring the motor voltage (Cl6.12) to 380.0V, display accuracy: 0.1
Motor Speed		 ● ○ ○ ○ ● FWD REV HZ A R/MIN	Monitoring the motor speed (Cl6.05) is 1440R, display accuracy: 1
DC Voltage		 ● ○ ○ ● ● FWD REV HZ A R/MIN	Monitoring DC voltage(Cl6.30) to 540.0V, display accuracy: 0.1
Inverter temperature		 ● ○ ○ ○ ● FWD REV HZ A R/MIN	Monitoring inverter temperature (parCl6.34) to 45°C, display accuracy: 1
Feedback Value		 ● ○ ● ○ ● FWD REV HZ A R/MIN	Monitoring feedback value(Cl6.52) to 28.000, display accuracy: 0.001





















Counter A			Monitoring counter A (Cl6.72) to 65535, showing accuracy of: 1
Counter B			Monitoring counter B(Cl6.72) to 65535, showing accuracy of : 1
Analog in VI			Monitoring analog in VI (Cl6.62) to 10.00V, display accuracy: 0.01
Analog in AI			Monitoring Analog in AI (Cl6.63) to 20.00mA, display accuracy: 0.01
Pulse Input			Monitoring pulse input (Cl6.68) to 50000Hz, display accuracy: 1
Pulse Output			Monitoring pulse output (Cl6.69) to 50000Hz, display accuracy: 1

**Note:** Press  key to change the display items on control panel, however, C00.33 must be activated (see C00.33).

#### 4.2.4 View alarm record



If the drive trips, fault code will be shown to illustrate the reason, all the alarm record will be saved.













Key-press	LCP Display	Action Description
	C0003	Press  key to display the first basic C00.03.

Key-press	LCP Display	Action Description
 	C15.00	Press   to select par. group No. C15.
	C15.00	Press  to select parameter number.
 	C15.30	Press   to select C15.30
	[0]	Press  to show the first option of C15.30
	**	Press  to show the first fault record.
	[1]	Press  to show the second fault record, it can most display the ten recent fault records in turn.



































































#### 4.2.5 View state parameter

View the status of input terminal, reference, feedback value, output frequency, output current, output voltage, and the power etc.

Key-press	LCP Display	Action Description
	C00.03	Press  to display the first basic parameter C00.03.

Key-press	LCP Display	Action Description
	Cl6.00	Press  to select Par. group No. Cl6
	Cl6.00	Press  to select parameter No.
	Cl6.01	Press  select Cl6.01
	0	Press  to finish browse value of Cl6.01.
	Cl6.60	Press  to select Cl6.60.
	0000	Press  to view the value in Cl6.60, 0100 indicates status of FOR, DI1 ,DI2 is 0, and status of REV is 1

## 4.2.6 LED Display

0	1	2	3	4	5	6	7	8	9
									
A	B	C	D	E	F	G	H	I	J
									
K	L	M	N	O	P	Q	R	S	T
									
U	V	W	X	Y	Z	-	+	.	=
									
a	b	c	d	e	f	g	h	i	j
									
k	l	m	n	o	p	q	r	s	t
									
u	v	w	x	y	z				
									

## Chapter 5 Parameter Overview

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 00: operation/display	*C00.03	Regional settings	0: 50 Hz ; 1: 60 hz;		0	
	C00.04	Operating state at power-up	0: Resume; 1: Forced stop reference=old; 2: Forced stop reference=0;		1	
	*C00.06	Grid type	0-132		*	
	C00.10	Active set-up	1: Set-up1; 2: set-up2; 9: Multi set-up;		1	
	C00.11	Edit set-up	1: Set-up1; 2: set-up2;		1	
	*C00.12	Link set-up	0: Not linked; 20: Linked;		20	
	C00.31	Custom readout min value	0.00-9999.00		0.00	
	C00.32	Custom readout max value	0.00-9999.00		100.00	
	C00.33	Lcd display option	0-2047		0	
	C00.40	[Hand on] key on lcd	0: Disabled; 1: enabled;		1	
	C00.41	[Off/reset] key on lcd	0: Disable all; 1: Enable all; 2: Enable reset only;		1	
	C00.42	[Auto] key on lcd	0: Disabled; 1: Enabled;		1	
	*C00.51	Set-up copy	0: No copy; 1: Copy from set-up1; 2: Copy from set-up2; 9: Copy from factory setup;		0	
	C00.60	Menu password	0: Disabled; 1: Enabled;		0	
	C01.00	Configuration mode	0: Speed open loop; 1: Speed closed loop; 3: Process closed loop;		0	
	*C01.01	Motor control principle	0: U/f; 1: vcc+;		1	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 00: operation/display	*COL03	Torque characteristics	0: Constant torque; 1: Mutative; 3: Energy optim;		0	
	*COL07	Application configuration mode	0: No function; 1: Wobble function; 2: Cascade control; 3: Winder function;		0	
	COL10	Motor construction	0: Asynchron; 1: spmsm 2: ipmsm		0	
	COL14	Damping gain	0 ~ 250	%	120	
	COL15	Low speed filter time const	0.01 ~ 20.00	S	0	
	COL16	High speed filter time const	0.01 ~ 20.00	S	0	
	COL17	Voltage filter time const	0.01 ~ 100	S	0	
	*COL20	Motor power [kw][hp]	Dep.On motor date	Kw	*	
	*COL22	Motor voltage(um.N)	50~1000	V	*	
	*COL23	Motor frequency(fm.N)	20~400	Hz	*	
	*COL24	Motor current(im.N)	Dep.On motor date	A	*	
	*COL25	Motor nominal speed(nm.N)	100~9999	Rpm	*	
	COL26	Motor cont. Rated torque	0.1 ~ 10000	Nm		
	*COL29	Automatic motor adaptation(ama)	0: Off; 1: Enabled complete ama; 2: Enable reduced ama;		0	
	*COL30	Stator resistance(RS)	Dep.On motor date	Ω	*	
*COL33	Stator leakage reactance(XH)	Dep.On motor date	Ω	*		

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 00: operation/display	*C0L35	Main reactance(XH)	DepOn motor date	$\Omega$	*	
	*C0L39	Motor poles	2~100	P	4	
	C0L40	Back emf at 1000 rpm	0 ~ 9000		500	
	*C0L42	Motor cable length	0~150	M	50	
	C0L50	Motor magnetisation at zero speed	0~300	%	100	
	C0L52	Min speed normal magnetising [Hz]	0.0~10.0	Hz	0.0	
	C0L55	U/f characteristic-u	0~999	V		
	C0L56	U/f characteristic-f	0~400	Hz		
	C0L60	Low speed load compensation	0~199	%	100	
	C0L61	High speed load compensation	0~199	%	100	
	C0L62	Slip compensation	-400~399	%	100	
	C0L63	Slip compensation time constant	0.05~5.00	S	0.10	
	C0L64	Resonance dampening	0~500	%	50	
	C0L65	Resonance dampening time constant	0.005~0.050	S	0.005	
	C0L66	Min current at low speed	0 ~ 120	%	50	
	C0L71	Start delay	0.0~10.0	S	0.0	
	C0L72	Start function	0: Dc hold/delay time; 2: Coast/delay time;		2	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 00: operation/display	*C0173	Flying start	0: Disabled; 1: Enabled;		0	
	C0180	Function at stop	0: Coast; 1: Dc hold;		0	
	C0182	Min speed for function at stop [Hz]	0.0~200	Hz	0.0	
	C0190	Motor thermal protection	0: No protection; 1: Thermister warning; 2: Termister trip; 3: Etr warning; 4: Etr trip;		0	
	*C0193	Thermister resource	0: None; 1: Analog input vi; 6: Digital input di4;		0	
Parameter group 02: brake function	C0200	Dc hold current	0~150	%	50	
	C0201	Dc brake current	0~150	%	50	
	C0202	Dc braking time	0.0~60.0	S	10.0	
	C0204	Dc brake cut in frequency	0.0~400.0	Hz	0.0	
	C0206	Parking current	0 ~ 150	%	100	
	C0207	Parking time	0.1 ~ 60.0	S	3.0	
	C0210	Brake function	Dep.On motor date		0	
	C0211	Brake resistor (OHM)	0~150	Ω	*	
	C0216	Ac brake, max current	0: Disabled; 2: Enabled;	%	100	
	C0217	Over-voltage control	0.00~100.00		0	
	C0220	Release brake current	0.0~400.0	A	0.00	
	C0222	Activate brake speed [Hz]	0: Min-max; 1: -Max+max;	Hz	0.0	



Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter Group 03 Reference/Ramps	C0300	Reference Range	0: Min-Max; 1: -Max-+Max;		0	
	C0302	Minimum Reference	-4999000~4999000		0.000	
	C0303	Maximum Reference	-4999000~4999000		50.000	
	C0310	Preset Reference	-100.00~100.00	%	0.00	
	C0311	Jog Speed [Hz]	0.0~400.0	Hz	5.0	
	C0312	Catch up/slow Down Value	0.00~100.00	%	0.00	
	C0313	SpeedUp/Down Value	0.01~50.00	Hz	0.10	
	C0314	Preset Relative Reference	-100.00~100.00	%	0.00	
	C0315	Reference Resource 1	0: No function; 1: Analog input VI; 2: Analog Input AI; & Pulse input; 1l: Local bus ref; 2l: LCP potentiometer;		1	
	C0316	Reference Resource 2			2	
	C0317	Reference Resource 3			1l	
	C0318	Relative Scaling Reference Resource			0	
	C0319	Save Speed Up/ Down Value	0: No function; 1: Stopsave; 2: Power down save;		0	
	C0340	Ramp 1 Type	0: Linear; 2: Sine2 ramp,		0	
	C0341	Ramp 1 Ramp up Time	0.05~3600.00	s	*	
	C0342	Ramp 1 Ramp Down Time	0.05~3600.00	s	*	
	C0350	Ramp 2 Type	0: Linear; 2: Sine2 ramp,		0	
C0351	Ramp 2 Ramp up Time	0.05~3600.00	s	*		

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.	
Parameter Group 03 Reference/Ramps	C0352	Ramp 2 Ramp down Time	0.05~3600.00	s	*		
	C0360	Ramp 3 Type	0: Linear; 2: Sine2 ramp;		0		
	C0361	Ramp 3 Ramp up Time	0.05~3600.00	s	*		
	C0362	Ramp 3 Ramp down Time	0.05~3600.00	s	*		
	C0370	Ramp 4 Type	0: Linear; 2: Sine2 ramp;		0		
	C0371	Ramp 4 Ramp up Time	0.05~3600.00	s	*		
	C0372	Ramp 4 Ramp down Time	0.05~3600.00	s	*		
	C0380	Jog Ramp Time	0.05~3600.00	s	*		
	C0381	Quick Stop Ramp Time	0.05~3600.00	s	*		
Parameter Group 04 Limits/Warnings	*C0410	Motor Speed Direction	0: Clockwise; 1: Counterclockwise; 2: Both;		2		
	*C0412	Motor Speed Low Limit [Hz]	0.0~4000	Hz	0.0		
	*C0414	Motor Speed High Limit [Hz]	0.0~4000	Hz	650		
	C0418	Current Limit	0~300	%	150		
	*C0419	Max. Output Frequency	0.0~4000	Hz	650		
	C0430	Motor Feedback Loss function	0: No function; 1: Freeze output; 3: Jog; 4: Max. Speed; 5: Stop and trip; 1f: Switch to open loop;			4	
	C0431	Motor Feedback Speed Error	0~600	rpm	300		
	C0432	Motor Feedback Loss Time	0.00~60.00	s	0.05		

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.	
Parameter Group 04: Limits/Warnings	C04.50	Warning Current Low	0.00~I <sub>max</sub>	A	0.00		
	C04.51	Warning Current High	0.00~I <sub>max</sub>	A			
	C04.52	Warning Speed Low	0.0~4000	Hz	00		
	C04.53	Warning Speed High	01~4000	Hz	65.0		
	C04.54	Warning Reference Low	-4999.000~4999.000		0.000		
	C04.55	Warning Reference High	-4999.000~4999.000		50.000		
	C04.56	Warning Feedback Low	-4999.000~4999.000		0.000		
	C04.57	Warning Feedback High	-4999.000~4999.000		50.000		
	*C04.58	Missing Motor Phase Function	0: Off; 1: On;			1	
	C04.61	Bypass Speed From [Hz]	0.0~4000	Hz	00		
	C04.63	Bypass Speed To [HZ]	0.0~4000	Hz	00		
		*C05.00	Digital Input Mode	0: PNP; 1: NPN;		0	
	*C05.01	Digital Input DI4 Mode	0: PNP; 1: NPN;		0		
	*C05.02	Digital Output DO Mode	0: PNP; 1: NPN;		0		
	C05.10	Terminal FOR Digital Input	0: No operation; 1: Reset;		8		
	C05.11	Terminal REV Digital Input	2: Coast inverse; 3: Coast and reset		10		
	C05.12	Terminal DI1 Digital Input	inverse; 4: Quick stop inverse;		15		
	C05.13	Terminal DI2 Digital Input	5: DC-brake inverse; 6: Stop inverse;		16		

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 05 digital in/out	C0514	Terminal DI3 Digital Input	8: Start; 9: Latched start; 10: Reversing; 11: Start reversing; 12: Enable start forward; 13: Enable start reverse; 14: Jog; 15: Preset ref bit0; 16: Preset ref bit1; 17: Preset ref bit2; 18: Preset ref bit3; 19: Freeze reference; 20: Freeze output; 21: Speed up; 22: Speed down; 23: Set-up select; 28: Catch up; 29: Slow down; 32: Pulse input(only available with terminal DI4 digital input); 34: Ramp bit0; 35: Ramp bit1; 60: CounterA(up); 62: Reset counterA; 63: CounterB(up); 65: Reset counterB;		17	
	C0515	Terminal DI4 Digital or Pulse Input	21: Speed up; 22: Speed down; 23: Set-up select; 28: Catch up; 29: Slow down; 32: Pulse input(only available with terminal DI4 digital input); 34: Ramp bit0; 35: Ramp bit1; 60: CounterA(up); 62: Reset counterA; 63: CounterB(up); 65: Reset counterB;		18	
	C0530	Terminal DO1 Digital Output	0: No operation; 1: Control ready; 2: Drive ready; 3: Drive ready/ Remote control; 4: Enable / No warning; 5: Drive running; 6: Running /No warning; 7: Run in rang/No warning; 8: Run on ref/No warning; 9: Alarm; 10: Alarm or Warning; 12: Out of current rang; 13: Below current, low; 14: Above current, high;		0	
	C0531	Terminal DO2 Digital Output	0: No operation; 1: Control ready; 2: Drive ready; 3: Drive ready/ Remote control; 4: Enable / No warning; 5: Drive running; 6: Running /No warning; 7: Run in rang/No warning; 8: Run on ref/No warning; 9: Alarm; 10: Alarm or Warning; 12: Out of current rang; 13: Below current, low; 14: Above current, high;		0	
	C0540	Relay Function(KA- KB, FA-FB, FB- FC)	0: No operation; 1: Control ready; 2: Drive ready; 3: Drive ready/ Remote control; 4: Enable / No warning; 5: Drive running; 6: Running /No warning; 7: Run in rang/No warning; 8: Run on ref/No warning; 9: Alarm; 10: Alarm or Warning; 12: Out of current rang; 13: Below current, low; 14: Above current, high;		5, 9	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
	Parameter group 05: digital in/out\		15: Out of frequency rang; 16: Below frequency, low; 17: Above frequency, high; 18: Out of feedback rang; 19: Below feed back, low; 20: Above feedback, high; 21: Thermal warning; 22: Ready, no thermal warning; 23: Remot ready, no thermal warning; 24: Ready, voltage ok; 25: Reverse; 26: Bus ok; 28: Brake, no brake warning; 29: Brake ready, no fault; 30: Brake fault(IGBT); 32: Mech brake control; 36: Control word bit 1; 37: Control word bit2; 40: Out of reference rang; 41: Below ref, low; 42: Above ref, high; 51: Local ref, active; 52: Remote ref, active; 53: No alarm; 54: Start command active; 55: Running reverse; 56: Drive in hand mode; 57: Drive in auto mode; 60-63: Comparator 0-3; 70-73: Logic rule 0-3; 80: SLC digital output 1; 81: SLC digital output2; 82: SLC relay 1; 83: SLC relay 2; 84: SLC digital output 3; 85: SLC digital output 4;			

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 05: digital in/out\	C05.55	Terminal DI4 Low Frequency	0.020~49999	KHz	0.020	
	C05.56	Terminal DI4 High Frequency	0.021~50.000	KHz	50.000	
	C05.57	Terminal DI4 Low Ref./Feedb. Value	-4999000~4999000		0.000	
	C05.58	Terminal DI4 High Ref./ Feedb.Value	-4999000~4999000		50.000	
	C05.59	Terminal DI4 Filter Time Contant	1~1000	ms	100	
	C05.60	Terminal DOI Pulse Output Variable	0: Dgital output; 10: Output frequency; 11: Reference; 12: Feedback; 13: Motor current; 16: Power; 17: Speed; 18: Motor voltage; 20: Bus control; 21: Pulse input; 22: Terminal VI input; 23: Terminal AI input ;		0	
	C05.61	Pulse Output Min Freq	0.020~49999	KHz	0.020	
	C05.62	Pulse Output Max Freq	0.021~50.000	KHz	50.000	
	C05.63	Pulse Output Min Scale	0.00~200.00	%	0.00	
	C05.64	Pulse Output Max Scale	0.00~200.00	%	100.00	
	*C05.70	Encoder Per Revolution	256~4096		1024	
	*C05.71	Encoder Derection(PG card)	0: Clock wise; 1: Counter clockwise;		0	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter Group 06: Analog In/Out	C06.00	Live Zero Timeout Time	1~99	s	10	
	C06.01	Live Zero Timeout Function	0: Off; 1: Freeze output; 2: Stop; 3: Jogging; 4: Max.speed; 5: Stop and Trip;		0	
	C06.10	Terminal VI Low Voltage	0.00~999	V	0.07	
	C06.11	Terminal VI High Voltage	0.10~10.00	V	10.00	
	C06.12	Terminal VI Low Current	0.00~1999	mA	0.14	
	C06.13	Terminal VI High current	0.01~20.00	mA	2000	
	C06.14	Terminal VI Low Ref./Feedb. Value	-4999.000~4999.000		0.000	
	C06.15	Terminal VI High Ref./ Feedb.Value	-4999.000~4999.000		50.000	
	C06.16	Terminal VI Filter Time Contant	0.01~10.00	s	0.01	
	C06.18	Terminal VI Zero dead band	0.00~20.00	V/ mA	0.00	
	C06.19	Terminal VI Mode	0: Votage mode; 1: Current mode;		0	
	C06.20	Terminal AI Low Voltage	0.00~999	V	0.07	
	C06.21	Terminal AI High voltage	0.01~10.00	V	10.00	
	C06.22	Terminal AI Low Current	0.00~1999	mA	0.14	
	C06.23	Terminal AI High Current	0.01~20.00	mA	2000	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 06: analog in/out	C06.24	Terminal AI Low Ref./Feedb. Value	-4999.000~4999.000		0.000	
	C06.25	Terminal AI High Ref./Feedb. Value	-4999.000~4999.000		50.000	
	C06.26	Terminal AI Filter Contant	0.01~10.00	s	0.01	
	C06.28	Terminal AI Zero dead band	0.00~20.00	V/ mA	0.00	
	C06.29	Terminal AI Mode	0: Voltage mode; 1: Current mode;		1	
	C06.70	Terminal VO Mode	0: 0~20mA; 1: 4~20mA; 3: 0~10V;		3	
	C06.71	Terminal VO Analog Output	0: No operation; 10: Output frequency; 11: Reference; 12: Feedback; 13: Motor current; 16: Power; 17: Speed; 18: Motor voltage; 20: Bus control; 21: Pulse input; 22: Terminal VI; 23: Terminal AI;		0	
	C06.73	Terminal VO Output Min Scale	0.00~200.00	%	0.00	
	C06.74	Terminal VO Output Max Scale	0.00~200.00	%	100.00	
	C06.81	LCP Potmeter Low Ref.	-4999.000~4999.000		0.000	
	C06.82	LCP Potmeter High Ref.	-4999.000~4999.000		50.000	
	C06.90	Terminal AO Mode	0: 0~20mA; 1: 4~20mA;		0	



Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.	
	C06.91	Terminal AO Analog output	See also C06.71.		0		
	C06.93	Terminal AO Output Min Scale	0.00~200.00	%	0.00		
	C06.94	Terminal AO Max Scale	0.00~200.00	%	100.00		
Parameter Group 07: Controllers	C07.02	Speed PID Proportional Gain	0.000~1.000		0.015		
	C07.03	Speed PID Integral Time	2.0~20000.0	ms	8.0		
	C07.04	Speed PID Differentiation Time	0.0~200.0	ms	30.0		
	C07.05	Speed PID Diff Gain Time	1.000~20.000		5.000		
	C07.06	Speed PID Lowpass Time	1.0~100.0	ms	10.0		
	*C07.08	Speed PID FeedForward Factor	0~5.00	%	0		
	C07.20	Process CL Feedback Resource	0: No Function; 1: Analog in VI; 2: Analog in AI; 8: Pulse input; 11: Local bus;			0	
	C07.30	Process PI Normal/Inverse Control	0: Normal; 1: Inverse;			0	
	C07.31	Process PI Anti Windup	0: Disabled; 1: Enabled;			1	
	C07.32	Process PI Start Speed	0.0~200.0	Hz	0.0		
C07.33	Process PI Proportional Gain	0.0~10.00			0.01		

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
	C0734	Process PI Integral time	0.10~999900	s	9999.00	
	C0738	Process PI FeedForward Factor	0~400	%	0	
	C0739	On Reference Bandwidth	0~200	%	5	
	C0741	Process PI Output Low	-100-100	%	0	
	C0742	Process PI Output High	-100-100	%	100	
Parameter Group 08: FC Port Setting	C0801	Control Site	0: Digital and ctrl. word; 1: Digital only; 2: Control Word only;		0	
	C0802	Control Word Source	0: None; 1: FC RS485;		1	
	C0803	Control Word Timeout Time	0.1~6500.0	s	10	
	C0804	Control Word Timeout Function	0: Off; 1: Freeze output; 2: Stop; 3: Jogging; 4: Max. speed; 5: Stop and trip;		0	
	C0806	Reset Control Word Timeout	0: No Function; 1: Do Reset;		0	
	C0830	Protocol	0: Fc; 2: Modbus rtu; 6: Modbus ascii;		0	
	C0831	Address	Fc(1~126); Modbus rtu(1~247);		1	
	C0832	FC Port Baud Rate	0: 2400; 1: 4800; 2: 9600; 3: 19200; 4: 38400; 5: Reserved; 6: Reserved; 7: Reserved; 8: Reserved; 9: Reserved;		2	
	C0835	Minimum Response Delay	0.001~0.500	s	0.010	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter Group 08 FC Port Setting	C08.36	Max. Response Delay	0.010~10.000	s	5.000	
	C08.50	Coasting Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.51	Quick Stop Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.52	DC Brake Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.53	Start Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.54	Reversing Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.55	Set-up Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.56	Preset Reference Select	0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR;		3	
	C08.94	Bus Feedback 1	-32768~32767		0	
Parameter Group 13 Simple PL	C1300	Sample PLC Mode	0: Off; 1: Order execution; 2: Parallel execution;		0	
	C1301	Start Event	0~54		39	
	C1302	Stop Event	0~54		40	
	C1303	Reset Sample PLC	0: Do not reset; 1: Reset Sample PLC;		0	
	C1310	Comparator Operand	0~31		0	
	C1311	Comparator Operator	0~2		1	
	C1312	Comparator Value	-99990~99990		00	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter Group 13 Simple PL	C13.20	SL Controller Timer	0.0~3600	s	0.0	
	C13.40	Logic Rule Boolean 1	0~64		0.0	
	C13.41	Logic Rule Operator 1	0~8		0	
	C13.42	Logic Rule Boolean 2	Same to C13.40		0	
	C13.43	Logic Rule Operator 2	0~8		0	
	C13.44	Logic Rule Boolean 3	Same to C13.40		0	
	C13.51	SL Controller Event	Same to C13.40		0	
	C13.52	SL Controller Action	0~69		0	
	C14.01	Switching Frequency	2~6: 2kHz~6kHz; 7: 8kHz; 8: 10 kHz; 9: 12kHz; 10: 16kHz;		4	
	*C14.03	Overmodulation	0: Off; 1: On;		1	
	C14.08	Damping Gain Factor	0~200	%	96	
	C14.12	Function at Mains Imbalance	0: Trip; 1: Warning; 2: Disabled;		0	
	C14.16	Low voltage mode	0: Disable; 1: enable;		0	
	C14.20	Reset Mode	0: Manual reset; 1~10: Automatic reset x 1~10; 11: Automatic reset x 15; 12: Automatic reset x 20; 13: Infinite auto reset;		0	
	C14.21	Automatic Restart Time	0~600	s	10	
	C14.22	Operation Mode	0: Normal Operation; 2: Initialisation;		0	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
	C14.23	Trip lock	0: Disable; 1: Enable;		1	
	C14.27	Action At Inverter Fault	0: Trip; 1: Warning;		0	
	*C14.40	VT Level	40-90	%	90	
	*C14.41	AEO Minimum Magnetisation	40~75	%	66	
	*C14.51	DC-Link Voltage Compensation	0: Off; 1: On;		1	
	*C14.55	Output Filter	0: Off; 1: Sine-Wave Filter; 3: Sine-Wave Filter with feedback;		0	
	*C14.63	Min Switch Frequency	2~6: 2kHz~6kHz; 7: 8kHz; 8: 10 kHz; 9: 12kHz; 10: 16kHz;		2	
Parameter Group 15: Drive Information	C15.00	Operating Days	0~9999	d		
	C15.01	Running Hours	0~60000	h		
	C15.02	KWh Counter	0~65535			
	C15.03	Power up's	0~2147483647			
	C15.04	Over Temp's	0~65535			
	C15.05	Over Volt's	0~65535			
	C15.06	Reset KWh Counter	0: Do not reset; 1: Reset Counter;			
	C15.07	Reset Running Hours Counter	0: Do not reset; 1: Reset Counter;			
	C15.30	Fault Log:Error Code	0~255			
	C15.31	Internal Fault Reason	-32767~32767			
	C15.40	FC Type	View FC type			
	C15.41	Power Section	View powersize of the drive			
	C15.42	Voltage	View Mains Voltage of the drive			
C15.43	Software Version	View the software version				

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter Group I5: Drive Information	CI5.44	Ordered Type Code	View the ordered type code of the drive			
	CI5.46	Frequency converter ordering NO.	View frequency converter ordering NO.			
	CI5.47	Power Card Ordering NO.	View power card ordering No. of the drive			
	CI5.48	LCP ID NO.	View LCP ID NO.			
	CI5.49	Software ID Control Card	View software ID control card			
	CI5.50	Software ID Power Card	View software ID Power card			
	CI5.51	Frequency Converter Serial Number	View frequency converter No.			
	CI5.53	Power Card Serial number	View power card serial number			
	CI5.92	Parameter List	View parameter list of the drive			
Parameter group I6: data readouts	CI6.00	Control word	-4999000~4999000			
	CI6.01	Reference [unit]	-200.0~200.0			
	CI6.02	Reference %	0~65535	%		
	CI6.03	Status word	0~2			
	CI6.04	Active set-up	0~9999			
	CI6.05	Motor speed [rpm]	0.00~9999.00	Hz		
	CI6.09	Custom readout	0.000~1000.000			
	CI6.10	Power[Kw]	0.000~1000.000	Kw		
	CI6.11	Power[Hp]	0.0~65535	Hp		
	CI6.12	Motor voltage	0.0~4000	V		
	CI6.13	Frequency	0.00~655.35	Hz		
	CI6.14	Motor current	0.0~2000	A		
	CI6.15	Frequency(%)	0~100	%		
	CI6.18	Motor thermal	0~65535	%		
	CI6.30	Dc link voltage	0~255	V		
	CI6.34	Heat sink temp.	0~255	°C		
CI6.35	Inverter thermal	0.00~655.35	%			

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.	
Parameter group 16 data readouts	Cl6.36	Inv. Nom. Current	0.00~655.35	A			
	Cl6.37	Inv. Max. Current	0~255	A			
	Cl6.38	Slc controller state	0.000~60.000				
	Cl6.40	Wobble length	-200.0~200.0	Km			
	Cl6.50	External reference	-200.0~200.0	%			
	Cl6.51	Pulse reference	-4999.000~4999.000	%			
	Cl6.52	Feedback # [unit]	0~65535				
	Cl6.60	Digital input	0: 0-10V; 1: 0-20ma;				
	Cl6.61	Terminal vi setting	0.000-20.000				
	Cl6.62	Analog input vi	0: 0-10V; 1: 0-20ma;	V/ma			
	Cl6.63	Terminal ai setting	0.000~20.000				
	Cl6.64	Analog input ai	0.000~20.000	V/ma			
	Cl6.65	Analog output ao	0~255	V/ma			
	Cl6.66	Digital output do	-9999.000~9999.000				
	Cl6.67	Encoder input	0.020~50.000	Khz			
	Cl6.68	Pulse input di4	0.020~50.000	Khz			
	Cl6.69	Pulse output do	0~65535	Khz			
	Cl6.71	Relay output [bin]	0~2147483647				
	Cl6.72	Counter a	0~2147483647				
	Cl6.73	Counter b	0.00~20.00				
	Cl6.78	Analog output ao	-32768~32767	Ma			
	Cl6.86	Fc port ref	0~0Xffffffful				
	Cl6.90	Alarm word	0~0Xffffffful				
	Cl6.91	Alarm word 2	0~0X7ffffffful				
	Cl6.92	Warning word	0~0X7ffffffful				
	Cl6.93	Warning word 2	0 ~ 200				
		C28.60	Current %	0.0 ~ 20.0	%		
		C28.61	Delay time	0.0 ~ Max reference	S	10.0	
		C28.62	Reference value	0.0 ~ Max reference	Hz	50.0	
		C28.70	Power adjust ratio	0~100	%	100	

Item	Parameter No.	Function Description	Setting range	Unit	Default setting	Page No.
Parameter group 28: special application	C28.71	Current adjust ratio	0~100	%	100	
	C28.80	Once save energy(kwh)	0.0~9999	Kwh	0	
	C28.81	Total save energy(kwh)	0.0~9999	Kwh	0	
	C28.82	Total save energy2(mwh)	0~65536	Mwh	0	
	C28.83	Current electrical price	0.000~100.000	Rmb	0	
	C28.84	Total save energy money(rmb)	0.0~9999	Rmb	0	
	C28.85	Total save energy money (krmb)	0~65536	K rmb	0	
	C28.86	Motor service ratio	0.10~100.00		100	
	C28.87	Compressor power	0.00~600.00	Kw		
	C28.88	Save energy count reset	0,1		0	

**Note:** Reference signed with “\*” in parameter No. column means this parameter can't be modified when the motor is running. In factory setting column, “\*” means the default setting for this parameter is determined by the drive type.



## Chapter 6 Parameter Description

### 6.1 Parameter Group 00:Operation/Display

#### C00.0\* Basic Settings

*C00.03	Function Description	Range	Unit	Default Setting
	Regional Settings	0~1		1

Option: [0] 50Hz, Motor frequency default value is 50 Hz, see C0L23;

[1] 60Hz, Motor frequency default value is 60 Hz, see C0L23;

Function: This parameter is used to select motor frequency default value according to different regions;

Attention: This parameter can not be adjusted when motor is running. At the same time changing this parameter may result in changes in the value of the following parameters: C0L23、C0L25、C0L39、C0L56、C0L30、C0L33、C0L35.

C00.04	Function Description	Range	Unit	Default Setting
	Operaton State at Power-up(Hand)	0~2		1

Option: [0] Resume, local reference is stored and used after power up;

[1] Forced stop, ref=old, local reference is stored and used after power up;

[2] Forced stop, ref=0, local reference is set to 0;

Function: This parameter is used to control whether or not the frequency converter should automatic running the motor when powering up after a power down in Hand mode.

Description of choice: When select “[0]”, frequency converter starts in same Hand mode roof state as when powered off; When select “[1]”, frequency converter powers up in off state meaning that motor is stopped after power up; When select “[2]”, frequency converter powers up in off state meaning that motor is stopped after power up. Local reference is set to 0. Thus motor will not start running before local reference has been increased.

Attention: If LCP with potentiometer is mounted, reference is set according to actual potentiometer value.

*C00.06	Function Description	Range	Unit	Default Setting
	Grid Type	0~132		*

Option: [0] 200-240V/50Hz/IT-Grid;  
 [1] 200-240V/50Hz/IT-Delta;  
 [2] 200-240V/50Hz;  
 [10] 380-440V/50Hz/IT-Grid;  
 [11] 380-440V/50Hz/IT-Delta;  
 [12] 380-440V/50Hz;  
 [20] 440-480V/50Hz/IT-Grid;  
 [21] 440-480V/50Hz/IT-Delta;  
 [22] 440-480V/50Hz;  
 [30] 525-600V/50Hz/IT-Grid;  
 [31] 525-600V/50Hz/IT-Delta;  
 [32] 525-600V/50Hz;  
 [100] 200-240V/60Hz/IT-Grid;  
 [101] 200-240V/60Hz/IT-Delta;  
 [102] 200-240V/60Hz;  
 [110] 380-440V/60Hz/IT-Grid;  
 [111] 380-440V/60Hz/IT-Delta;  
 [112] 380-440V/60Hz;  
 [120] 440-480V/60Hz/IT-Grid;  
 [121] 440-480V/60Hz/IT-Delta;  
 [122] 440-480V/60Hz;  
 [130] 525-600V/60Hz/IT-Grid;  
 [131] 525-600V/60Hz/IT-Delta;  
 [132] 525-600V/60Hz;

Function: A correct type of Grid can optimize the output voltage/frequency.

### C00.1\* Set-up Operations

C00.10	Function Description	Range	Unit	Default Setting
	Active Set-up	1~9		1

Option: [1] Set-up 1;  
 [2] Set -up 2;  
 [9] Multi set-up;

Description of choice: HLP-SK180 series inverter contains 2 set-ups: set-up 1 and set-up 2, which can be switched via input on digital input terminals or via other ways. Binary code of the digital input terminals correspond with set-ups as follows:

Binary	Bit0	Set-up no.
Terminal state	0	1
	1	2

Attention: The set-up can be switched between linked set-ups (See C00.12) or when the motor is stop.

C00.11	Function Description	Range	Unit	Default Setting
	Edit Set-up	1~2		1

Option: [1] Set-up 1;

[2] Set-up 2;

Function: This parameter can be edited via LCP or serial communication port.

*C00.12	Function Description	Range	Unit	Default Setting
	Link Set-ups	1~20		20

Option: [0] not linked, parameters between two set-ups can not change each other while the motor is running;

[20] Linked, the link ensures synchronizing of the parameters that can not be changed, while the motor is running. When this is done, it is possible to shift from one set-up to the active set-up selected.

Description of the choice: This parameter should be used in conjunction with the active set-up. When C00.12 = 20, synchronize the “not changeable during operation” parameters of the two set-ups. When C00.10 = 9, the motor is running and switching the active set-up is needed, if C00.12 = 20, switching can be achieved while the motor is running; if C00.12 = 0, set-ups can't be switched until the motor is stopped.

### C00.3\*LCP Readout

C00.31	Function Description	Range	Unit	Default Setting
	Custom Readout Min Value	0~9999.00		0.00

Function: This parameter occurs at 0 Speed.

Description of the choice: This parameter allows the choice of the min. value of the custom defined readout.

C00.32	Function Description	Range	Unit	Default Setting
	Custom Readout Max Value	0~9999.00		100.00

Function: This parameter corresponds to settings in par. C04.14.

Description of the choice: This parameter sets the max value to be shown when the speed of the motor has reached the set value for C04.14.

Attention: C00.31 and C00.32 can adjust display of the custom readout value, such as speed.

C00.33	Function Description	Range	Unit	Default Setting
	LCP Display Option	0~2047		0

Description of the choice: LCP will be fixed to display the output frequency, reference and motor current. This parameter is used to show 11 basic operating states of the inverter, each parameter corresponds to a binary code: "1" means display the item, "0" means does not display the item. For example, if you want to display the states of the temperature and the terminal VI on LCP. Transform the binary code to decimal digit, C00.33=1×23+1×27=136.

Pulse output	Pulse input	AI	VI	Counter	Counter	Feedback value	Temperature	De-voltage	Motor speed	Motor voltage
0	0	0	1	0	0	0	1	0	0	0

#### C00.4\* LCP Keypad

C00.40	Function Description	Range	Unit	Default Setting
	[HAND ON] Key on LCP	0~1		1

Option: [0] Disable: Hand-on key has no function;  
 [1] Enable: Hand-on key is functional;

Description of the choice: The frequency converter can operate in the following three mode: HAND, OFF/RESET and AUTO. When running in Hand-on mode, the frequency converter is locally operated and does not allow any remote control. By activating hand a start signal is given.

C00.41	Function Description	Range	Unit	Default Setting
	[OFF/RESET] Key on LCP	0~2		1

Option: [0] Disable, OFF/RESET key has no function;  
 [1] Enable, OFF/RESET key stop signal and reset of any fault;  
 [2] Enable Reset only, Reset only (fault), stop (off) function is disabled;

Description of the choice: When OFF/RESET key is chosen, the frequency converter

C00.42	Function Description	Range	Unit	Default Setting
	[AUTO] Key on LCP	0~1		1

Option: [0] Disabled, Auto-on key has no function;

[1] Enabled, Auto-on key is functional;

Description of the choice: In auto-mode, the frequency can be remote controlled (bus/digital).

### C00.5\*Copy/Save

*C00.51	Function Description	Range	Unit	Default Setting
	Set-up Copy	1~9		0

Option: [0] No copy;

[1] Copy from set-up 1;

[2] Copy from set-up 2;

[9] Copy from factory setting;

Function: Copy parameters settings from selected set-up to edited set-up (C011).

Attention: When selected set-up is same to the edited set-up, copy function doesn't work; both control panel and parameter database are locked while copying.

### C00.6\* Protection

C00.60	Function Description	Range	Unit	Default Setting
	Menu Password	0~1		

Option: [0] Disabled;

[1]Enabled, none of parameter can be changed except this;

Function: This feature used to prevent non-commissioning person to change the parameter settings.

Attention: Main Menu Password function is only valid to LCP, not active to local bus.

## 6.2 Parameter Group 01:Load and Motor

### C01.0\* General Settings

*C01.00	Function Description	Range	Unit	Default Setting
	Configuration Mode	0~3		0

Option: [0] Speed open loop,for general applications;

[1] Speed closed loop,with feedback (encoder), for high speed accuracy applications, only effective in VVC+ mode. For detailed parameter settings please refer to C070\*;

[3] Process closed loop,feedback signal is a process unit, such as: pressure 、 temperature etc. When process closed loop is selected, the motor can only run clockwise. For detailed parameter settings, please refer to C07.3\*.

Attention: If configuration mode is changed, C03.00, C03.02, C03.03 will be restored to factory setting.

---

*C01.01	Function Description	Range	Unit	Default Setting
	Control Principle	0~1		1

---

Option: [0] V/F, used for parallel connected motors or special motors, V/F settings are set in C0L55 and C0L56 separately;

[1] VVC+, used on applications that needs torque compensation at low frequency or higher requirements on control performance.

Description of choice: Before V/F or VVC+ control, perform AMA first to get correct motor data.

Attention: When V/F control mode is selected, slip compensation and load compensation are invalid; When VVC+ control mode is selected, it includes slip compensation and load compensation itself.

---

*C01.03	Function Description	Range	Unit	Default Setting
	Torque Characteristics	0~3		0

---

Option: [0] Constant torque, used for constant torque load;

[1] Variable torque, used for variable torque load, such as fan applications, centrifugal pump etc;

[3]Auto Energy optimization, see C14.4l AEO minimum magnetisation.

Function: Choose suitable torque characteristics, it is possible to run low energy consuming, as well as high torque applications.

---

*C01.07	Function Description	Range	Unit	Default Setting
	Application configuration Mode	0~3		0

---

Option: [0] No function;

[1] Wobble function(reserved);

[2] Cascade control(reserved);

[3] Winder function(reserved);

Function: This parameter enables a choice of a configuration setting that fits different applications. Wobble function is only valid under speed open loop, in other control mode, wobble function will be automatically shut down. If wobble function is selected, parameterC03.00 will be set to "0".

### CL1\* Motor Selection

Parameter group for setting general motor data. This parameter group cannot be adjusted while the motor is running.

*C01.10	Function Description	Range	Unit	Default Setting
	Motor Construction	0~3		0

Option: [0] Asynchron;  
 [1] SPMSM;  
 [2] IPMSM;

*C01.14	Function Description	Range	Unit	Default Setting
	Damping Gain	0~250		0

Function: Set Damping Gain for current PM.

*C01.15	Function Description	Range	Unit	Default Setting
	Low Speed Filter Time Const	0.01 ~20		0

Function: Set Low speed filter time.

*C01.16	Function Description	Range	Unit	Default Setting
	High Speed Filter Time Const	0.01 ~20		0

Function: Set high speed filter time.

*C01.17	Function Description	Range	Unit	Default Setting
	Voltage Filter Time Const	0.01 ~ 20		0

Function: Set voltage filter time.

### C0L2\* Motor Date

In this parameter group, enter correct motor nameplate data (power, voltage, frequency, current and speed). And then run AMA to obtain the best motor data which will be stored in C0L3\*.

Attention: Data of Parameter group C0L2\* can not be changed when motor is running.

*C01.20	Function Description	Range	Unit	Default Setting
	Motor Power	Dep. Motor date	KW	

Function: Select the KW value that corresponds to the rated power of the motor.

Description of choice: Factory settings depend on the inverter size, there is one

or two undersize or one oversize in comparison with factory setting.

Attention: Changing the value of this parameter affects the setting of C0L22-C0L25 and C0L30-C0L35.

*C0L22	Function Description	Range	Unit	Default Setting
	Motor Voltage	50~1000	V	*

Function: Select a value that equals the nameplate data on the motor.

Description of choice: Default setting depends on the inverter size.

*C0L23	Function Description	Range	Unit	Default Setting
	Motor Frequency	20~400	Hz	*

Function: Enter the rated motor frequency from the nameplate data.

Description of the choice: Default setting depends on the inverter size.

Attention: Changing this parameter affects motor nominal speed set in C0L25.

*C0L24	Function Description	Range	Unit	Default Setting
	Motor Current	Dep. motor data	A	*

Function: Enter motor current value from nameplate data.

Description of the choice: Factory settings depend on the unit size.

*C0L25	Function Description	Range	Unit	Default Setting
	Motor Norminal Speed	100~9999	RPM	*

Function: Enter the motor nominal speed value from the nameplate data.

Description of the choice: Factory setting depends on the unit size.

Attention: If motor frequency has been changed in C0L23, Nominal Motor Speed will be affected.

C0L26	Function Description	Range	Unit	Default Setting
	Motor Cont. Rated Torque	0.1~10000		*

Enter the value from the motor nameplate data. This parameter is available only when par. I-10 Design is set to PM, non-salient SPM [1][2].

Note: Changing this parameter will affect settings of other parameters.

*C0L29	Function Description	Range	Unit	Default Setting
	Automatic Motor Adaption (AMA)	0~2		0

Option: [0] Disabled;



[1] Enable complete AMA, run complete AMA which will take up a longer time;

[2] Enable reduced AMA, if LC filter is used between the motor and the frequency converter;

Description of the choice: AMA can be used to obtain accurate motor parameters, optimizing control performance.

Attention: If LC filter is connected between motor and the frequency converter, only reduced AMA can be carried out, and can't test the symmetry of the motor and whether there are phase losses in the drive. For the best possible adaptation of the frequency converter, it is recommended to run AMA on a cold motor. This function is disabled when the motor is running.

### C01.3\* Adv.Motor Data

This parameter can not be changed while motor is running.

*C01.30	Function Description	Range	Unit	Default Setting
	Stator resistance( $R_s$ )	Dep.motor data	$\Omega$	*

Function: Set stator resistance value. Enter the value from a motor data sheet or perform an AMA on a cold motor.

Description of the choice: Depending on motor data.

*C01.33	Function Description	Range	Unit	Default Setting
	Stator leakage reactance	Dep.motor data	$\Omega$	*

Function: Set stator leakage reactance value. Enter the value from a motor data sheet or perform an AMA on a cold motor. The default setting is calculated by the drive from motor nameplate data.

Description of the choice: Depending on motor data.

*C01.35	Function Description	Range	Unit	Default Setting
	Main Reactance(Hh)	Dep.motor data	$\Omega$	*

Function: Set the main reactance value. Enter the value from a motor data sheet or perform an AMA on a cold motor. The default setting is calculated by the drive from motor nameplate data.

Description of the choice: Depending on motor data.

*C01.37	Function Description	Range	Unit	Default Setting
	d-axis Inductanc	0.000~1000		*

Enter the value of the d-axis inductance. Obtain the value from the permanent magnet motor data sheet. The d-axis inductance cannot be found by performing an AMA.

*C01.39	Function Description	Range	Unit	Default Setting
	Motor Poles	2~100	P	4

Function: Enter the motor poles from the nameplate data.

Description of the choice: Depending on motor data.

#### **C01.4\*Motor Cable Length**

C01.40	Function Description	Range	Unit	Default Setting
	Back EMF at 1000 RPM	10 ~9000		*

Line-Line RMS back EMF voltage at 1000 RPM

*C01.42	Function Description	Range	Unit	Default Setting
	Motor Cable Length	0~150	m	50

Function: Enter the motor cable length connected between the motor and the frequency converter.

Description of the choice: Set correct cable length can suppress noises resulted from the motor.

#### **C01.5\*Load Indep.Setting**

C01.50	Function Description	Range	Unit	Default Setting
	Motor Magnetisation at zero speed	0~300	%	100

Function: Enter a percentage value of the rated magnetizing current.

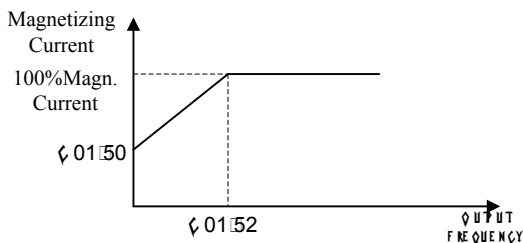
Description of the choice: Use this par. with par. 1-52 to obtain a different thermal load on the motor when running at low speed.

Attention: If the setting is too low; the torque on the motor may be reduced.

C01.52	Function Description	Range	Unit	Default Setting
	Min Speed Normal Magnetizing[Hz]	0.0~10.0	Hz	

Function: Set the required frequency for normal magnetising current. Use this par. along with par. 1-50.

Attention: If the frequency is set lower than the motor slip frequency, par. C01.50 is inactive.



C01.55	Function Description	Range	Unit	Default Setting
	V/F Characteristic-V	0~999.9	V	0/Vn

Function: This parameter is an array parameter [0-5], used for setting voltage [V0-V5] at each frequency point to manually form a V/F characteristic matching motor. Frequency points are defined in par. C01.56, V/F characteristics - F.

Description of choice: This parameter is only functional when par. C01.01, Motor Control Principle is set to V/F [0].

Attention: V0 factory setting is set to 0V, and U1-U5 factory setting is set to Un(motor rated voltage).

C01.55	Function Description	Range	Unit	Default Setting
	V/F Characteristic-V	0~999.9	V	0/Vn

Function: This parameter is an array parameter [0-5], used for setting voltage [V0-V5] at each frequency point to manually form a V/F characteristic matching motor. Frequency points are defined in par. C01.56, V/F characteristics - F.

Description of choice: This parameter is only functional when par. C01.01, Motor Control Principle is set to V/F [0].

Attention: V0 factory setting is set to 0V, and U1-U5 factory setting is set to Un(motor rated voltage).

C01.56	Function Description	Range	Unit	Default Setting
	V/F Characteristic-F	0~400	Hz	0/Fn

Function: This parameter is an array parameter [0-5], used for setting frequency points [F0-F5] to manually form a V/F characteristic matching motor. Voltage at each point is defined in par. C01.55, V/F Characteristic - V.

Description of choice: This parameter is only functional when par. C0101 Motor Control Principle is set to V/F [0].

Attention: F0 factory setting is set to 0Hz, and F1-F5 factory setting is set to Fn(Motor rated frequency); for par. C0156 the following applies  $F0=0$  and  $F1 \leq F2 \leq F3 \leq F4 \leq F5$ .

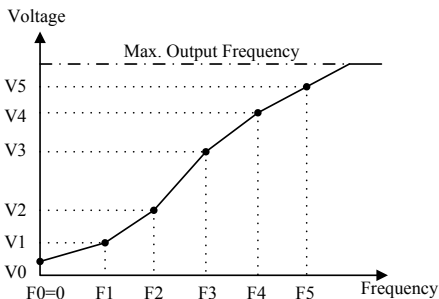


Fig. 61 V/F characteristic diagram

Simplify V/F characteristic by merging 2 or more points (voltages and frequencies), which respectively are set equal.

The slope (ratio of V/F) after point (F5, V5) must be equal to the slope between point (F5, V5) and the previous point.

#### C016\*Load Depen.Setting

C01.60	Function Description	Range	Unit	Default Setting
	Low Speed Load Compensation	0~199	%	100

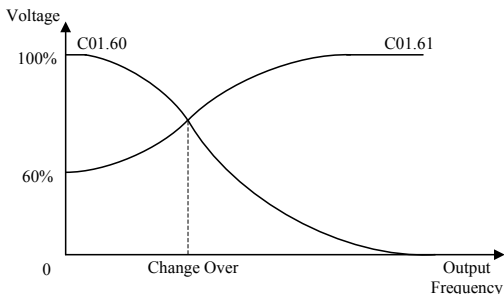
Function: Use this parameter to compensate voltage in relation to load when motor runs at low speed.

Description of choice: Enter a percentage value to compensate voltage when motor needs running at low speed. Change-over point is automatically calculated based on motor size.

C01.61	Function Description	Range	Unit	Default Setting
	High Speed Load Compensation	0~199	%	100

Function: Use this parameter to compensate voltage in relation to load when motor runs at high speed.

Description of Choice: Enter a percentage value to compensate voltage when motor needs running at low speed. Change-over point is automatically calculated based on motor size.



C01.62	Function Description	Range	Unit	Default Setting
	Slip Compensation	-400~399	%	100

Function: Dynamically adjust the output frequency of the motor, maintain the motor approaching a constant speed, and doesn't vary with load changes.

Description of Choice: This function is only active when par. C01.00, Configuration Mode, is set to Speed Open Loop [0], and when par. C01.01, Motor Control Principle, is set to VVC+ [1]. Slip compensation is calculated automatically based on rated motor speed, nM,N.

C01.63	Function Description	Range	Unit	Default Setting
	Slip Compensation Time Contant	0.05~5.00	s	0.10

Function: Enter the slip compensation reaction speed. A high value results in slow reaction, and a low value results in quick reaction. If low-frequency resonance problems arise, use a longer time setting.

C01.64	Function Description	Range	Unit	Default Setting
	Resonance Dampening	0~500	%	50

Function: High-frequency resonance problems between motor and the frequency converter can be eliminated by setting this parameter.

C01.65	Function Description	Range	Unit	Default Setting
	Resonance Dampening Time constant	0.005~0.050	s	0.005

Description of choice: Choose a time constant that provides the best dampening.

C01.66	Function Description	Range	Unit	Default Setting
	Min Current at Low Speed	0 ~ 120	%	50%

Enter the minimum motor current at low speed, see par. 1-53 Model Shift Frequency. Increasing this current improves motor torque at low speed.

### C01.7\*Start Adjustments

C01.71	Function Description	Range	Unit	Default Setting
	Start Delay	0.0~10.0	s	0.0

Function: This parameter enables a delay of the starting time. The frequency converter begins with the start function selected in par. 1-72. Set the start delay time until acceleration is to begin.

Attention: Setting start delay to 0.0 sec. disables Start Function, [C01.72] when start command is given.

C01.72	Function Description	Range	Unit	Default Setting
	Start Function	0~2		2

Option: [0] DC Hold/delay time;  
[2] Coast/delay time;

Function: Select [0], Motor is energized with DC holding current (par. C02.00) during start delay time; Select [2], Motor is coasted during start delay time (inverter off).

*C01.73	Function Description	Range	Unit	Default Setting
	Flying Start	0~1		0

Option: [0] Disabled;  
[1] Enabled;

Description of Choice: This function applies for the inertia load to restart due to mains drop-out; If Clockwise[0] is selected(C04.10), and no rotating motor is found, It is possible to use DC-brake command to ramp down the motor speed to 0 rpm, and then start the motor in the normal way; If Both directions [2](C04.10) is selected, and no rotating motor is found, the drive will assume the motor is stationary or in low-speed rotation,

and then start the motor in the normal way. When Flying start is enabled, C0171 (Start delay) and C0172 (Start function) is invalid.

Warning: This function is not suitable for hoisting applications.

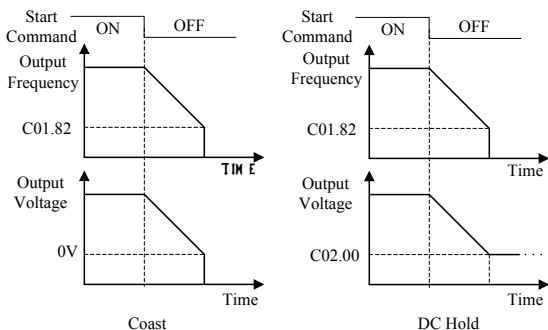
### C01.8\*Stop Adjustments

C01.80	Function Description	Range	Unit	Default Setting
	Function at Stop	0~1		0

Option: [0] Coast, the inverter is off;

[1] DC Hold, the motor is energized with a DC current. See par. C02.00 DC Hold Current for more information.

Function: Here it is possible to select the stop function according to different applications.



Description of Choice: This function is active in the following situations: Stop command is given and output speed is ramped down to Min. Speed for activating Functions at Stop; Start command is removed (standby), and output speed is ramped down to Min. Speed for activating Functions at Stop; DC-brake command is given, and lasts out of DC-brake delay time.

C01.82	Function Description	Range	Unit	Default Setting
	Min Speed for Function at Stop[Hz]	0.0~20.0	Hz	0.0

Function: Set the output frequency at which to activate par. C01.80 Function at stop.

**C0L9\*Motor Temperature**

C0L9.90	Function Description	Range	Unit	Default Setting
	Motor Thermal Protection	0~4		0

Option: [0] No protection;

[1] Thermistor warning, A thermistor connected to either digital or analog input gives a warning if upper limit of motor temperature range is exceeded, (see par. C0L93, Thermistor Resource).

[2] Thermistor trip, A thermistor connected to either digital or analog input gives an alarm and makes the frequency converter trip if upper limit of motor temperature range is exceeded, (see par. C0L93, Thermistor Resource).

[3] ETR warning, If calculated upper limit of motor temperature range is exceeded, a warning occurs.

[4] ETR trip, If calculated upper limit of motor temperature range is exceeded, an alarm occurs and frequency converter trips.

Function: Running ETR (Electronic Terminal Relay) function, motor temperature is calculated based on frequency, speed and time. Holip recommends performing the ETR function, if a thermistor is not present.

*C0L93	Function Description	Range	Unit	Default Setting
	Thermistor Resource	0~6		0

Option: [0] None;

[1] Analog input VI, Connect thermistor to analog input terminal VI;

[6] Digital input DI4, Connect thermistor to digital input terminal DI4;

Function: Select the thermistor input terminal.

Attention: Analog input can't be selected for other purpose when selected as thermistor resource.

Digital input DI4 can't be selected for other purpose when selected as thermistor resource.

Thermistor specifications:

Input signal type	Voltage supply	Thermistor threshold
Digital	10V	<0.8K $\omega$ , >2.9K $\omega$
Analog	10V	<0.8K $\omega$ , >2.9K $\omega$



## 6.3 Parameter Group 02: Brakes

### C02.0\*DC -Brake

C02.00	Function Description	Range	Unit	Default Setting
	DC Hold Current	0~150	%	50

Function: This parameter either holds the motor (holding torque) or preheats the motor. This parameter is active if DC Hold has been selected in either C0172 start function or C0180 Function at Stop.

Description of Choice: Enter a value for holding current as a percentage of the rated motor current set in par. C0124 Motor Current. 100% DC holding current corresponds to IM,N.

Attention: Avoid 100% current too long as it may overheat the motor.

C02.01	Function Description	Range	Unit	Default Setting
	DC Brake Current	0~150	%	50

Function: This parameter is used for setting the DC brake currents that is set as a percentage value of the rated motor current IM, N set in C0124.

Description of Choice: Parameters related to the DC brake current are as follows:

DC-brake command, see C051\* choice(5);

DC brake cut in speed, see C02.04;

C02.02	Function Description	Range	Unit	Default Setting
	DC Braking Time	0.0~60.0	s	10.0

Function: This parameter defines DC brake current (C02.01) time during which DC-brake current is applied to the motor.

C02.04	Function Description	Range	Unit	Default Setting
	DC Brake Cut in Speed	0.0~400.0	Hz	0.0

Function: This parameter is for setting the DC brake cut in speed at which the DC braking current (par.02.01) is to be activated, in connection with a stop command. When set to 0 the function is off.

C02.06	Function Description	Range	Unit	Default Setting
	Parking Current	0 ~ 150	%	100

Set current as % of rated motor current, par. 1-24

C02.07	Function Description	Range	Unit	Default Setting
	Parking Time	0.1 ~ 60.0	s	3

Set the duration of the Parking Current set in par. 2-06, once activated.

#### C02.1\*Brake Energy Funct.

C02.10	Function Description	Range	Unit	Default Setting
	Brake Function	0~2		0

Option: [0] off;

[1] Resistor brake, use the resistor brake to consume surplus energy resulting from motor braking, and prevent the frequency converter to trip due to over-voltage in the intermediate circuit;

[2] AC brake, dissipate surplus energy in the motor core, and prevent the energy back into frequency converter causing trips. It is important to keep in mind that frequent use of this function will cause a sharp increase in motor temperature.

Attention: Resistor brake is only functional when the frequency converter build-in braking unit or external braking unit must be installed.

C02.11	Function Description	Range	Unit	Default Setting
	Brake Resistor(ohm)	5~65535	$\Omega$	*

C02.11	Function Description	Range	Unit	Default Setting
	Brake Resistor(ohm)	5~65535	$\Omega$	*

C02.16	Function Description	Range	Unit	Default Setting
	AC Brake, Max Current	0~150	%	100

Function: Enter the maximum permissible current when using AC brake to avoid overheating of motor windings. 100% equals motor current set in C02.4.

C02.17	Function Description	Range	Unit	Default Setting
	Over-voltage Control	0~2		0

Option: [0] Disabled, The OVC is not active/required;

[2] Enabled, OVC is running;

Function: OVC is used to consume surplus energy by increasing the output frequency. Select whether to enable OVC, which reduces the risk of drive trip due to over voltage on the DC link caused by generative

power from load.

Attention: The OVC is not active/required if resistor brake has been chosen in C02.01 (Brake Function).

### C02.2\***Mechanical Brake**

For hoisting applications an electro-magnetic brake is required, brake signal can be sent via the relay. The brake activates if frequency converter trips or a coast command is given. Furthermore, it activates when the motor speed is ramped down below the speed set in C02.22, Activate Brake Speed.

C02.20	Function Description	Range	Unit	Default Setting
	Release Brake Current	0.00~100.0	A	0.00

Function: Set motor current at which mechanical brake is released. The relay acts when motor speed is greater than settings in this parameter.

Attention: If start delay time has passed, and motor current is below Release brake current, frequency converter trips.

C02.22	Function Description	Range	Unit	Default Setting
	Activate Brake Speed	0.0~400.0	Hz	0.0

Function: The mechanical brake is activated when motor speed is less than Activate Brake Speed.

Description of Choice: This feature occurs in the following situations:

- A start command is removed;
- A stop command is activated;
- Quick-stop is activated (Q-stop function is used);

## 6.4 Parameter Group 03: Reference/Ramps

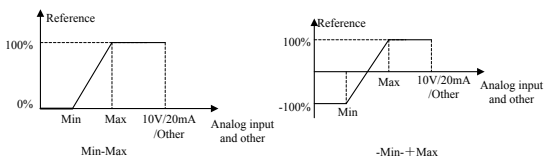
### C03.0\* Reference Limits

C03.00	Function Description	Range	Unit	Default Setting
	Reference Range	0~1		0

Option: [0] Min-Max, Reference set point ranges can have positive values only.

[1] -Max~+Max, Ranges can have both positive and negative values.

Function: Select the range of reference, only positive values are allowed when configuration mode (C01.00) is set to Speed Closed Loop [1] or Process Closed Loop [3].



C03.02	Function Description	Range	Unit	Default Setting
	Minimum Reference	-4999.000~4999.000		0.000

Function: Enter value for Minimum Reference.

Description of Choice: The sum of all internal and external references is clamped (limited) to the minimum reference value.

C03.03	Function Description	Range	Unit	Default Setting
	Maximum Reference	-4999.000~4999.000		50.000

Function: Enter value for Maximum Reference.

Description of Choice: The sum of all internal and external references is clamped (limited) to the maximum reference value.

Attention: The maximum reference can not be less than C03.02 (Minimum Reference).

### C03.1\*\*References

C03.10	Function Description	Range	Unit	Default Setting
	Preset Reference	-100.00~100.00[16]	%	0.00

Function: This parameter is an array-16 to be used for presetting different references.

Description of Choice: When C03.00 select "1"(-Min~Max), 100%= value set in

C0303. When C0300 select “0”(Min~Max), for example, If C0302 is set to “20” and C0303 is set to 50, 0%=0 and 100%=50; If C0302 is set to “-70”, and C0303 is set to 50, 0%=0 and 100%=70.

Each parameter set-up contains 16 preset references which are selectable via digital terminals or via local bus. See C05F\*.

Selection of preset reference indicates with a four-digital binary code. If the frequency converter detects the corresponding terminals connected, then the bit is “1”, otherwise, the bit is “0”. Digital input terminal, binary code and the corresponding relationship between pre-set values as follows:

Binary system	Bit3	Bit2	Bit1	Bit0	Preset reference
Terminals state	0	0	0	0	0
	0	0	0	1	1
	0	0	1	0	2
	0	0	1	1	3
	0	1	0	0	4
	0	1	0	1	5
	0	1	1	0	6
	0	1	1	1	7
	1	0	0	0	8
	1	0	0	1	9
	1	0	1	0	10
	1	0	1	1	11
	1	1	0	0	12
	1	1	0	1	13
	1	1	1	0	14
	1	1	1	1	15

C03.11	Function Description	Range	Unit	Default Setting
	Jog Speed	0.0~400.0	Hz	5.0

Function: Jog frequency is a fixed frequency that the drive supplies to the motor after the jog function is activated. Please refer to C05F\*, select [14].

Description of Choice: The frequency converter with the highest priority will operate at jog speed when a variety of run command activates. Removing the jog signal makes the frequency converter run according to the selected configuration, this parameter is set limited by C04I4.

C03.12	Function Description	Range	Unit	Default Setting
	Catch up/Slow down Value	0.00~100.00	%	0.00

Function: This parameter enables the entry of a percentage value (relative) which will to be either added to or deducted from the actual reference.

Description of Choice: The Catch up/Slow down function is activated by a digital input terminal(See C051\*choose[28]/[29]). If this function is active, the catch up/slow down value will be added to the actual reference constituting new setting at which the frequency converter is going to run, calculated as follows:

$$\text{Total reference} = \text{reference} \pm \text{reference} \times (\text{Catch up/Slowdown value})$$

If this function is inactive, the reference returns to its original value (the actual reference).

For example: Set C0512=28, C0513=29, C0312=30, assuming the actual reference value is 20 Hz, when only DI1 is on, the output frequency is 26 Hz, when only DI2 is connected, the output frequency is 14Hz, when both DI1 and DI2 are on, the output frequency is 20Hz.

C03.13	Function Description	Range	Unit	Default Setting
	Speed Up/Down Value	0.01~50.00	Hz	0.10

Function: Enter the Speed Up/Down value.

C03.14	Function Description	Range	Unit	Default Setting
	Preset Relative Reference	-100.00~100.00	%	0.00

Function: Define an adjustable Preset Relative Reference which is to be added to the total reference as a percentage value of the actual reference.

Total Reference=Actual Reference+Actual Reference \* Preset Relative Reference + Actual reference \* Relative Scaling Reference

Example:

Min reference/ c0302	Preset relative reference/ c0314	Relative scaling reference vi/c0318=1	Preset reference/ c0310	Max reference/ c0303	Output frequency(hz)
0	0%	10V	20%	50	10+0+10=20
0	10%	8V	20%	50	10+1+8=19
0	20%	5V	20%	50	10+2+5=17
0	30%	3V	20%	50	10+3+3=16
0	40%	0V	20%	50	10+4+0=14

C03.15	Function Description	Range	Unit	Default Setting
	Reference Resource1	0~21		1

---

C03.16	Function Description	Range	Unit	Default Setting
	Reference Resource2	0~21		2

---

C03.17	Function Description	Range	Unit	Default Setting
	Reference Resource3	0~21		11

Option: [0] No function, no reference resource is defined;

[1] Analog in VI, use signals from Analog input VI as reference resource, see C06.1\*;

[2] Analog in AI, use signals from Analog input AI as reference resource, see C06.2\*;

[8] Pulse input, use signals from Pulse input (DI4) as reference resource, see C05.5\*;

[11] Local bus reference, use signals from Local bus reference as reference resource, see C08.9;

[21] LCP potentiometer, use signals from LCP potentiometer as reference resource, see C06.8\*;

Function: C03.15、C03.16 and C03.17 define up to three different reference signals, the sum of which defines is the actual reference.

C03.18	Function Description	Range	Unit	Default Setting
	Relative Scaling Ref	0~21		0

Option: [0] No function: No relative scaling ref. resource is defined;

[1] Analog input VI, select analog input VI as relative scaling ref. source, see C06.1\*;

[2] Analog input AI, select analog input AI as relative scaling ref. source, see par. C06.2\*;

[8] Pulse input, select pulse input (DI4) as relative scaling ref. source, see par. C05.5\*;

[11] Local bus reference, select local bus reference as relative scaling ref. source, see par. C08.9\*;

[21] LCP potentiometer, select LCP potentiometer as relative scaling ref. source, see par. C06.8\*;

Function: The Relative Scaling Ref. Resource can be set via Analog input terminals, Local bus reference and LCP potentiometer.

C03.19	Function Description	Range	Unit	Default Setting
	Save Speed Up/Down Value	0~2		0

Option: [0] No Function;

[1] Stop Save;

[2] Power Down Save;

Function: This parameter is used for setting whether to save the data changed in the Up/Down function if the frequency stops or after it power down.

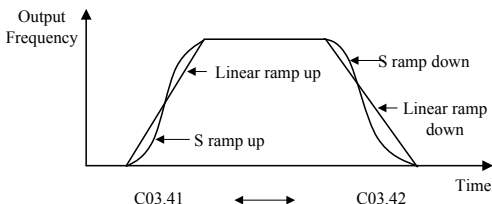
### C03.4#Ramp1

C03.40	Function Description	Range	Unit	Default Setting
	Ramp 1 Type	0~2		0

Option: [0] Linear: Motor ramp up to the preset frequency at a constant speed.

[2] S ramp: Motor ramp to the preset frequency with smooth curve.

Description of Choice: If Linear [1] is selected, the frequency may exceed the preset setting during the acceleration; If S ramp [2] is selected, due to smoother S curve, it will automatically adjust acceleration when approaching to the preset frequency to avoid exceeding it.



Attention: It is possible to switch acceleration and deceleration via digital input terminals, see parameter C051\* choice. The state of the digital input terminal is shown in binary code; If the drive detects the corresponding digital input terminals connected, then the bit is '1', on the contrary is '0'. The corresponding relationship between state of the digital input terminals, binary code and the selected ramp type are as follows:

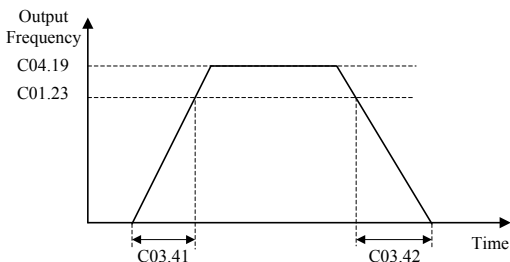
Binary system	Bit1	Bit0	Ramp group
Terminal state	0	0	1
	0	1	2
	1	0	3
	1	1	4



C03.41	Function Description	Range	Unit	Default Setting
	Ramp1 Ramp up Time	0.05~3600.00	s	*

Function: Enter acceleration time from 0 Hz to rated Motor speed in C0L25.

Attention: Ensure that the output current required to achieve the given ramp-up time does not exceed the limit in C04I8.



C03.42	Function Description	Range	Unit	Default Setting
	Ramp1 Ramp Down Time	0.05~3600.00	s	*

Function: Enter the deceleration time from the rated motor speed in C0L25 to 0Hz.

Attention: During ramping, no over-voltage may arise in inverter due to regenerative operation of motor. Furthermore, output current must not exceed limit in C04I8.

### C03.5\*Ramp2

C03.50	Function Description	Range	Unit	Default Setting
	Ramp2 Type	0~2		0

Option: [0] Linear: Motor ramp up to the preset frequency with a constant acceleration;

[2] S-ramp: Motor ramp to the preset frequency in a smooth curve.

C03.51	Function Description	Range	Unit	Default Setting
	Ramp2 Ramp up Time	0.05~3600.00	s	*

Function: Enter acceleration time from 0Hz to rated Motor speed in C0L25.

Attention: Ensure that the output current which is required to achieve the given ramp-up time does not exceed the limit in C04I8.

C03.52	Function Description	Range	Unit	Default Setting
	Ramp2 Ramp Down Time	0.05~3600.00	s	*

Function: Enter the deceleration time from the rated motor speed in C0L25 to 0Hz.

Attention: During ramping, no over-voltage may arise in inverter due to regenerative operation of motor. Furthermore, output current must not exceed limit in C04I8.

### C03.6\*Ramp3

C03.60	Function Description	Range	Unit	Default Setting
	Ramp3 Type	0~2		0

Option: [0] Linear: Motor ramp up to the preset frequency with a constant acceleration;

[2] S-ramp: Motor ramp to the preset frequency in a smooth curve.

C03.61	Function Description	Range	Unit	Default Setting
	Ramp3 Ramp up Time	0.05~3600.00	s	*

Function: Enter acceleration time from 0Hz to rated Motor speed in C0L25.

Attention: Ensure that the output current which is required to achieve the given ramp-up time does not exceed the limit in C04I8.

C03.62	Function Description	Range	Unit	Default Setting
	Ramp3 Ramp Down Time	0.05~3600.00	s	*

Function: Enter the deceleration time from the rated motor speed in C0L25 to 0Hz.

Attention: During ramping, no over-voltage may arise in inverter due to regenerative operation of motor. Furthermore, output current must not exceed limit in C04I8.

### C03.7\*Ramp4

C03.70	Function Description	Range	Unit	Default Setting
	Ramp4 Type	0~2		0

Option: [0] Linear: Motor ramp up to the preset frequency with a constant acceleration;

[2] S-ramp: Motor ramp to the preset frequency in a smooth curve.

C03.71	Function Description	Range	Unit	Default Setting
	Ramp4 Ramp up Time	0.05~3600.00	s	*

Function: Enter acceleration time from 0Hz to rated Motor speed in C0L25.

Attention: Ensure that the output current which is required to achieve the given ramp-up time does not exceed the limit in C04I8.

C03.72	Function Description	Range	Unit	Default Setting
	Ramp4 Ramp Down Time	0.05~3600.00	s	*

Function: Enter the deceleration time from the rated motor speed in C0L25 to 0Hz.

Attention: During ramping, no over-voltage may arise in inverter due to regenerative operation of motor. Furthermore, output current must not exceed limit in C04I8.

### C03.8\*Other Ramps

C03.80	Function Description	Range	Unit	Default Setting
	Jog Ramp Time	0.05~3600.00	s	*

Function: Enter the time required motor speed from 0Hz up to rated motor speed (C0L25) or from the rated motor speed (C0L25) down to 0Hz.

Description of Choice: Jog ramp time starts upon activation of a jog signal via a selected digital input or serial communication port. See C05I, choose [4].

C03.81	Function Description	Range	Unit	Default Setting
	Quick Stop Ramp Time	0.05~3600.00	s	*

Function: Enter the Quick Stop Ramp Time from the rated motor speed (C0L25) to 0Hz.

Description of Choice: Quick Stop Ramp Down Time is applicable when Quick Stop Ramp Time is activated, see C05I\*, choose [4].

## 6.5 Parameter Group 04: Limits/warnings

### C04.1\*Motor Limits

*C04.10	Function Description	Range	Unit	Default Setting
	Motor Speed Direction	0~2		2

Option: [0] Clockwise, the motor shaft rotates in clockwise direction; this setting prevents the motor from running in counter clockwise direction.

[1] Counter clockwise, motor shaft rotates in counter clockwise direction, this setting prevents the motor from running in clockwise direction.

[2] Both Directions, with this setting, the motor can run in both directions.

*C04.12	Function Description	Range	Unit	Default Setting
	Motor Speed Low Limit	0.0~400.0	Hz	0.0

Function: Set the minimum Motor Speed Limit which must not exceed the Motor Speed High Limit in parC04.14.

*C04.14	Function Description	Range	Unit	Default Setting
	Motor Speed High Limit	0.0~400.0	Hz	65.0

Function: Set the maximum Motor Speed Limit which must not exceed the Max Output Frequency in C04.19.

C04.18	Function Description	Range	Unit	Default Setting
	Current Limit	0~300	%	150

Function: Set the output current high limit.

Attention: If a setting in C0L20 to C0L25 is changed, this parameter is not automatically reset to default setting.

*C04.19	Function Description	Range	Unit	Default Setting
	Max Output Frequency	0.0~400.0	Hz	65

Function: Enter value of the maximum output frequency.

### C04.3\*Motor Feedback Monitor

C04.30	Function Description	Range	Unit	Default Setting
	Motor Feedback Loss Function	0~11	1	4

Option: [0] No operation;

[1] Freeze output;

[3] Jog;

[4] Operating at the max.output frequency;

[5] Stop and warning;

[11] Open loop running;

Function: Define the drive actions when motor feedback has been lost.

Attention: When HAND mode, Speed-closed loop, is selected, Options [1]、[3]、[4] are invalid.

C04.31	Function Description	Range	Unit	Default Setting
	Motor Feedback loss threshold	1~600	rpm	300

Function: In Speed Closed-loop Control mode, this parameter used to determine whether the motor speed feedback has been lost.

C04.32	Function Description	Range	Unit	Default Setting
	Motor Feedback Loss	0.00~60.00	s	0.05

Function: Define “Motor Feedback Loss” delay time. If the motor feedback signal is interrupted within this delay time, the timer resets.

#### C04.5\*Adj. Warnings

This parameter group is used for setting warning threshold of output current , output frequency , reference and feedback .

C04.50	Function Description	Range	Unit	Default Setting
	Warning Current Low	0.00~ $I_{max}$	A	0.00

Function: Use this parameter to set a lower limit for current, if current drops below the set limit, a warning occur. Setting range depends on the frequency converter type.

Attention: This setting must be within normal motor current range, or, it may produce an error warning.

C04.51	Function Description	Range	Unit	Default Setting
	Warning Current High	0.00~ $I_{max}$	A	

Function: Use this parameter to set an upper limit for current, if current exceeds the set limit, a warning occurs. Setting range and default setting depends on the frequency converter type.

Attention: This setting must be within normal motor current range, or, it may produce an error warning.

C04.52	Function Description	Range	Unit	Default Setting
	Warning Speed Low	0.0~400.0	Hz	0.0

Function: Use this parameter to set a lower limit for frequency, if frequency drops below set limit, a warning occurs.

Attention: This setting must be within normal motor frequency range, or, it may produce an error warning.

C04.53	Function Description	Range	Unit	Default Setting
	Warning Speed High	0.1~400.0	Hz	65.0

Function: This parameter used for setting an upper limit, if frequency exceeds the set limit, a warning occurs.

Attention: This setting must be within normal motor frequency range, or, it may produce an error warning.

C04.54	Function Description	Range	Unit	Default Setting
	Warning Reference Low	-4999.000~4999.000	Hz	0.000

Function: Use this parameter to set a lower limit for reference, if frequency drops below set limit, a warning occurs.

C04.55	Function Description	Range	Unit	Default Setting
	Warning Reference High	-4999.000~4999.000		50.000

Function: This parameter used for setting an upper limit for reference, if reference value exceeds the set limit, a warning occurs.

C04.56	Function Description	Range	Unit	Default Setting
	Warning Feedback Low	-4999.000~4999.000		0.000

Function: Use this parameter to set a lower limit for feedback, if feedback drops below set limit, a warning occurs.

C04.57	Function Description	Range	Unit	Default Setting
	Warning Feedback High	-4999.000~4999.000		50.000

Function: This parameter used for setting an upper limit for feedback, if feedback value exceeds the set limit, a warning occurs.

*C04.58	Function Description	Range	Unit	Default Setting
	Missing Motor Phase Function	0~1		1

Option: [0] Off, function is disabled;

[1] On, function is enabled;

Attention: Missing of motor phase causes motor torque to drop. This function may be disabled for special purpose (e.g. small motor running pure U/f mode). However, choosing [0] Off, function disabled, may lead to overheating. Holip strongly recommends to turn on this function.

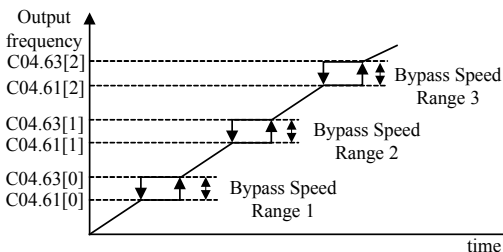
### C04.6\*Speed Bypass

C04.61	Function Description	Range	Unit	Default Setting
	Bypass Speed From	0.0~400.0	Hz	0.0

Array[3]

Function: This parameter is a dyadic Array, [0] is set as the start frequency of bypass speed range 1, [1] is set as the start frequency of bypass speed range 2, and [2] is set as the start frequency range 3.

Description of Choice: In some certain range of the output frequency, some points need to be set to be avoided because of resonance problems in system. The drive will pass quickly when it approaching to the Bypass Speed area. If start frequency the same as end frequency, the bypass speed is invalid.



C04.63	Function Description	Range	Unit	Default Setting
	Bypass Speed to	0.0~400.0	Hz	0.0

Array[3]

Function: This parameter is a dyadic array, [0] is set as the end frequency of bypass speed range 1, [1] is set as the end frequency of bypass speed range 2, and [2] is set as the end frequency of bypass speed range 3.

## 6.6 Parameter Group 05: Digital Input/Output

### C05.0\*Digital I/O Mode

*C05.00	Function Description	Range	Unit	Default Setting
	Digital Input Mode	0~1		0

*C05.01	Function Description	Range	Unit	Default Setting
	Digital Input DI4 Mode	0~1		0

Option: [0] PNP, active at high level;

[1] NPN, active at low level;

Attention: PNP: Digital input terminals must be connected to high level voltage (+24V). NPN: Digital input terminals must be connected to low level voltage (0V).

*C05.02	Function Description	Range	Unit	Default Setting
	Digital Output DO Mode	0~1		0

[1] NPN, active at low level;

Function: Select the desired digital output signals.

### C05.1\*Digital Input

C05.10	Function Description	Range	Unit	Default Setting
	Terminal FOR Digital Input	0~93		8

C05.11	Function Description	Range	Unit	Default Setting
	Terminal REV Digital Input	0~93		10

C05.12	Function Description	Range	Unit	Default Setting
	Terminal DI1Digital Input	0~93		15

C05.13	Function Description	Range	Unit	Default Setting
	Terminal DI2Digital Input	0~93		16

C05.14	Function Description	Range	Unit	Default Setting
	Terminal DI3Digital Input	0~93		17

C05.15	Function Description	Range	Unit	Default Setting
	Terminal DI4 Digital Input	0~93		18

Option: [0] No operation, the frequency converter will not to react to signals transmitted to the terminal;

[1] Reset, reset the frequency converter after a Trip/Alarm;

[2] Coast Inverse, no output, leaving the motor coasting to stop;

[3] Coast and reset Inverse, the frequency converter resets leaving the motor coasting to stop.



- [4] Quick stop Inverse, generates a stop in accordance with the quick-stop ramp time set in C038I;
- [5] DC-brake Inverse, see C02.0I, this function is only active when value in C02.02 and C02.04 are different from 0.
- [6] Stop Inverse, the drive is stopped according to selected ramp time;
- [8] Start, I=start, 0=stop;
- [9] Pulse start, motor starts if a pulse signal(pulse with of not less 4ms) is received.
- [10] Reversing, change direction of motor shaft rotation, reversing signal only changes direction of rotation, it does not activate start function, C04.I0 must choose[2] Both directions;
- [11] Start reversing, used for start/stop and for reversing at the same time;
- [12] Enable start forward only, the motor can only run clockwise direction;
- [13] Enable start reverse only, motor can only run counterclockwise direction;
- [14] Jog, used for activating jog speed, see C03II;
- [15] Preset ref. bit0, Preset ref.bit0 、 bit1 、 bit2 、 bit3 is used for the choice of the preset reference, see parC03I0;
- [16] Preser ref. bit1, same as[15];
- [17] Preser ref. bit2, same as[15];
- [18] Preser ref. bit3, same as[15];
- [19] Freeze reference, the frozen reference is the start point of up/down when Speed up and Speed down to be used. If Speed up/down is used, speed change always follows ramp 2 in the range par. C03.02 Minimum Reference - par. C03.03 Maximum Reference. If freezing reference is active, stop the frequency converter via a terminal programmed for to [2] Coast Inverse or [3] Coast and reset , inverse ;
- [20] Freeze output, the frozen reference is the start point of up/down when Speed up and Speed down to be used. If Speed up/down is used, the speed change always follows ramp 2 in the range 0 - Motor rated frequency;
- [21] Speed up, Activate this function by selecting either Freeze reference or Freeze output.When Speed up is activated for less than 400 ms. the resulting reference will be increased by 0.1%. If Speed up is activated for more than 400 ms. the resulting reference will ramp according to ramp 2 ;
- [22] Speed down, same as speed up [21];
- [23] Set-up select, see C00.I0(Active Set-up);
- [26] Precise stop inverse ,the function is available for C05I5/DI4 only;
- [27] Start-Precise stop, same as [26], but including start;
- [28] Catch up, select catch up to increase the resulting reference value by the percentage set in par. C03I2;
- [29] Slow down, select slow down to reduce the resulting reference value by the percentage set in par. C03I2;

[32] Pulse input, Select Pulse input when using a pulse sequence as either reference or feedback. Scaling is done in par. group C05.5\*,the function is available for C05.15/DI4 only;

[34] Ramp bit0、bit0、bit1 used for select acceleration or deceleration;

[35] Ramp bitl, same as [34];

[60] Counter A(up);

[62] Reset counter A, to clear counter A to “0”;

[63] Counter B(up);

[65] Reset counter B, to clear Counter B to “0”;

### C05.3\*Digital Output

C05.30	Function Description	Range	Unit	Default Setting
	Terminal DO1 Digital Output	0~108		0

Attention: Because the DO1 can be used as pulse output, it must be selected in the C05.60 digital output, the function of this parameter selection is active;

C05.31	Function Description	Range	Unit	Default Setting
	Terminal DO2 Digital output	0~108		0

### C05.4\*Relay

C05.40	Function Description	Range	Unit	Default Setting
	Relay Function	0~108		5, 9

Array: [0]-[I] Array[0] indicates relay1, array[I] indicates relay2.

Option: [0]No operation;

[1]Control ready,inverter control card have received supply voltage;

[2]Drive ready,Frequency converter is ready for operation and applies supply signal on control card;

[3] Drive ready, remote, Frequency converter is ready for operation in Auto-on mode;

[4] Enable/No warning, Frequency converter is ready for operation. No start or stop command is given. No warning is present;

[5]Drive running, Motor is running;

[6]Running/No warning, Motor runs and no warnings are present;

[7]Run in range/No warning. Motor runs within programmed current ranges, see C04.50 and C04.51. No warnings are present;

[8]Run on reference/No warning. Inverter runs at reference speed without warnings;

[9]Alarm. Frequency converter alarms;

[10]Alarm or warning. An alarm or warning occurs;

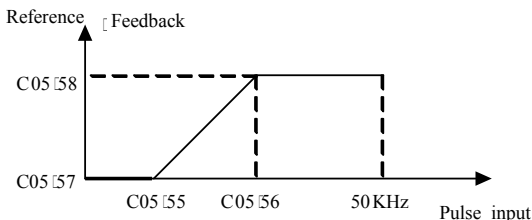
- [12] Out of current range. Output current exceeds the current range set in C04.50 and C04.51;
- [13] Below current, low. Output current is lower than set in C04.50;
- [14] Above current, high. Output current is higher than set in C04.51;
- [15] Beyond frequency range. Output frequency beyond range set in C04.52 and C04.53;
- [16] Below frequency, low. Output frequency is lower than value set in C04.52;
- [17] Above frequency, high. Output frequency is higher than value set in C04.53;
- [18] Beyond the scope of the feedback. The feedback received from the inverter exceeds the setting range in C04.56 and C04.57;
- [19] Below feedback, low. The feedback received from inverter is lower than settings in C04.56;
- [20] Above feedback, high. The feedback received from inverter is higher than settings in C04.57;
- [21] Thermal warning. A thermal warning occurs;
- [22] Ready, no Thermal warning. Frequency converter is ready for operation and no over-temperature warning is present;
- [23] Remote ready, no Thermal Warning. Frequency converter is ready for operation in remote control, and no over-temperature warning is present;
- [24] Ready-Voltage OK. Frequency converter is ready for operation, main voltage is within specified voltage range;
- [25] Reverse. Motor runs in counter clockwise;
- [26] Bus OK. Local bus communication is normal;
- [28] Brake-No warning. Brake is active, and no warnings are present;
- [29] Brake ready/No fault. Brake is ready for operation, and no fault is present;
- [30] Brake fault(IGBT). Brake IGBT module fault is present;
- [32] Mech. Brake Control. Enter mechanical brake control signal, see C02.2\*;
- [36] Control word bit11, bit11 in control word controls relay;
- [37] Control word bit12, bit12 in control word controls relay;
- [40] Exceeding reference range. Reference outside the setting range in C04.54 and C04.55;
- [41] Below reference, low. Reference is lower than parameter settings in C04.54;
- [42] Above reference, high. Reference is higher than the parameter settings in C04.55;
- [51] Local ref. active;
- [52] Remote ref. active;
- [53] No alarm. Frequency converter is running normally, no alarm;

- [54] Start command active;
- [55] Running reverse. Drive runs in counterclockwise;
- [56] Frequency converter in HAND mode;
- [57] Frequency converter in AUTO mode;
- [60] Comparator 0, Using a simple PLC, the results of comparator 0;
- [61] Comparator 1, Using a simple PLC, the results of comparator 1;
- [62] Comparator 2, Using a simple PLC, the results of comparator 2;
- [63] Comparator 3, Using a simple PLC, the results of comparator 3;
- [70] Logic Rule 0, Using a simple PLC, the results of logic rule 0;
- [71] Logic Rule 1, Using a simple PLC, the results of logic rule 1;
- [72] Logic Rule 2, Using a simple PLC, the results of logic rule 2;
- [73] Logic Rule 3, Using a simple PLC, the results of logic rule 3;
- [80] Sample PLC Digital Output 1 Only active for DO1/C05.30;
- [81] Sample PLC Digital Output. Only active for DO2/C05.31;
- [82] Sample PLC Relay 1. Only active for Relay 1/C05.40[0];
- [83] Sample PLC Relay 2. Only active for Relay 2/C05.40[1];
- [84] Sample PLC Digital Output 3, Only active for DO3/C05.32;
- [85] Sample PLC Digital Output 4, Only active for DO4/C05.33;
- [90] Up to Wobble Limit, see C30\*;
- [91] Up to Wobble ref., see par. C30\*;
- [100] Start Pump 1, see C25\*;
- [101] Start Pump 2, see C25\*;

### C05.5\*Pulse Input

C05.55	Function Description	Range	Unit	Default Setting
	Terminal DI4 Low Frequency	0.020~49.999	KHz	0.020

Function: Enter low frequency corresponding to Digital input terminals DI4;



Description of Choice: Set C0515 to 32(pulse input), digital input terminals DI4 receives the pulse signal. Low frequency corresponds to reference/feedback in C05.57.

C05.56	Function Description	Range	Unit	Default Setting
	Terminal DI4 High Frequency	0.021~50.000	KHz	50.000

Function: Enter the high frequency corresponding to digital input terminals DI4.

Description of Choice: High frequency corresponds to reference/feedback in C05.58.

C05.57	Function Description	Range	Unit	Default Setting
	Terminal DI4 Low Frequency	-4999.000~4999.000		0.000

Function: Enter low frequency /feedback corresponding to value in par. C05.55.

C05.58	Function Description	Range	Unit	Default Setting
	Terminal DI4 High Ref./feedback	-4999.000~4999.000		50.000

Function: Enter high ref./feedback corresponding to value in C05.56.

C05.59	Function Description	Range	Unit	Default Setting
	Terminal DI4 Filter Constant	1~1000	ms	100

Function: Setting a appropriate time constant, can stabilize the noise in the

terminal DI4, filter longer, more stable analog changes, but the response will be slower.

### C05.6\*Pulse Output

C05.60	Function Description	Range	Unit	Default Setting
	DO1 Pulse Output Variable	0~23		0

Option: [0] Digital Output, see C0530;

[10] Output frequency, 0.020-50.000KHz corresponding to 0-200Hz;

[11] Reference, C0300 select“0” [Min – Max], 0% = 0.020KHz, 100% = 50.000KHz; C0300 select“1” [-Max – Max], -100% = 0.020KHz, 100% = 50.000KHz;

[12] Feedback, 0.020-50.000KHz corresponding to -200% ~ 200%;

[13] Motor current, 0.020-50.000KHz corresponding to 0-Max. motor current, see par. Cl6.37;

[16] Power, 0.020-50.000KHz corresponding to 0-Motor current, see C0L20;

[17] Speed, 0.020-50.000KHz corresponding to 0-Motor speed, see C0L25;

[18] Motor voltage, 0.020-50.000KHz corresponding to 0-Motor voltage, see C0L22;

[20] Bus control: 0.020-50.000KHz corresponding to 0.0% - 100.0%, 100% equals to settings in C0303;

[21] Pulse input, 0.020-50.000KHz corresponding to reference in C0555-C0556 entered via DI4;

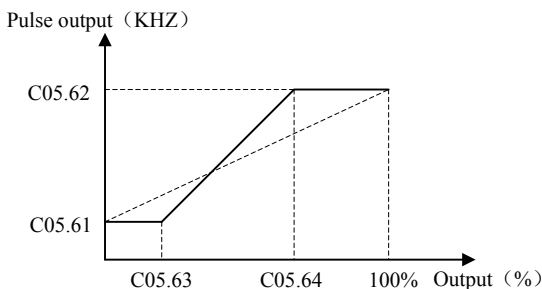
[22] Values on analog input VI, 0.020-50.000KHz corresponding to references in C0610、C0612 and C0611、C0613;

[23] Values on analog input AI, 0.020-50.000KHz corresponding to reference in C06.20、C06.22 and C06.21、C06.23;

Description of Choice: Pulse output matches along with reference in the range from Min. frequency(C05.61) to Max. frequency(C05.62). Scaling can be set via C05.6 and C05.64.

C05.61	Function Description	Range	Unit	Default Setting
	Pulse Output Min. Freq	0.020~49.999	KHz	0.020

Function: Define the minimum possible frequency for pulse output.



C05.62	Function Description	Range	Unit	Default Setting
	Pulse Output Max. Freq	0.021~50.000	KHz	50.000

Function: Enter Max. frequency of pulse output.

C05.63	Function Description	Range	Unit	Default Setting
	Pulse Output Min. Scale	0.00~200.00	%	0.00

Function: Enter pulse output min. scale, set as a percentage value of max. signal.

C05.64	Function Description	Range	Unit	Default Setting
	Pulse Output Max. Scale	0.00~200.00	%	100.00

Function: Enter pulse output max. scale, set as a percentage value of max. signal.

### C05.7\*Encoder Input

*C05.70	Function Description	Range	Unit	Default Setting
	Encoder per Revolution	256~4096		1024

Function: Encoder resolution (number of pulses per revolution of the motor, see C05.70) is determined by the maximum frequency of receiving pulses of the PG card (up to 205KHZ). According to the encoder resolution and speed (rpm), in accordance with the following formula  $F = C05.70 \times RPM / 60$  can calculate the output frequency.

*C05.71	Function Description	Range	Unit	Default Setting
	Encoder Direction	0~1		0

Function: Select “0”(clockwise), or select”1” (counter clockwise). Change the detecte encoder direction (revolution) without changing the wire to the encoder. You can't set the parameter while the motor is running.

## 6.7 Parameter Group 06: Analog In/Out

### C06.0\*Analog I/O Mode

C06.00	Function Description	Range	Unit	Default Setting
	signal interrupt Time	1~99	s	10

Function: Set the delay time to determine whether the analog signal is interrupted . If the analog signal is interrupted for the time longer than the set value, the drive will issue a signal interruption warning.

Description of Choice: If the analog input signal is back to normal within the delay time, then, reset the timer.

C06.01	Function Description	Range	Unit	Default Setting
	Signal interrupt Func	1~5		0

Option: [0] Off;

[1] Freeze output, drive runs in the current output frequency.

[2] Stop;

[3] Jogging, drive operates in jog mode;

[4] Max. speed, drive runs at motor speed high limit(C04.14);

[5] Stop and trip, drive stops to output,and issues a warning.

Description of Choice: To active the Live Zero Timeout Function, if voltage input is selected, then the low input voltage (C06.10, C06.20) settings must be greater than 1V; if current input is selected, the low input current (C06.12, C06.22) settings must be greater than 2mA or more. If the analog input signal is lower than 50% of the settings of parameters of C06.10, C06.12, C06.20, C06.2, and lasts longer than the settings of the parameters of C06.00, this feature take effect.

### C06.1\*Analog Input 1

C06.10	Function Description	Range	Unit	Default Setting
	Terminal VI Low Voltage	0.00~9.99	V	0.07

Function: Enter VI Low Voltage corresponding to Min. reference/feedback set in C06.14.



C06.11	Function Description	Range	Unit	Default Setting
	Terminal VI High voltage	0.10~10.00	V	10.00

Function: Enter VI High Voltage corresponding to Max. reference/feedback set in C06.15.

C06.12	Function Description	Range	Unit	Default Setting
	Terminal VI Low Current	0.00~19.99	mA	0.14

Function: Enter VI Low Current corresponding to Min. reference/feedback set in C06.14.

C06.13	Function Description	Range	Unit	Default Setting
	Terminal VI High Current	0.01~20.00	mA	20.00

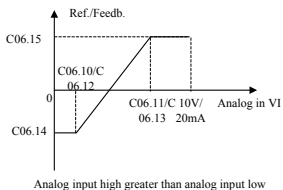
Function: Enter VI High Current corresponding to Max. reference/feedback set in C06.15.

C06.14	Function Description	Range	Unit	Default Setting
	Terminal VI Low Ref./Feedb	-4999.000~4999.000		0.000

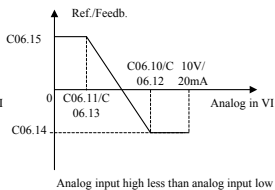
Function: Enter VI Low Ref./Feedb. Corresponding to Min. voltage or min. current set in C06.10 or C06.12.

C06.15	Function Description	Range	Unit	Default Setting
	Terminal VI High Ref./Feedb	-4999.000~4999.000		50.000

Function: Enter VI High Ref./Feedb. Corresponding to max voltage or max current set in C06.11 or C06.13.



Analog input high greater than analog input low



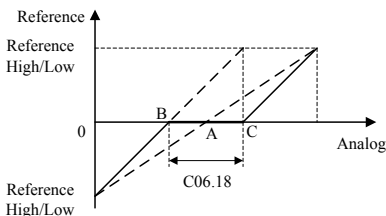
Analog input high less than analog input low

C06.16	Function Description	Range	Unit	Default Setting
	Terminal VI Filter Time Contant	0.01~10.00	s	0.01

Function: Set propriate filter time ,which can stabilize noise of analog input VI.  
The longer the filter, the more stable analog, but the response will be slower.

C06.18	Function Description	Range	Unit	Default Setting
	Terminal VI Zero Dead Band	0.00~20.00	V/mA	0.00

Function: Set the dead-band of VI at 0 speed. When analog input VI ref. low and ref. high have opposite signs, there must be a set point that corresponding to an analogue value equals 0. In order to prevent the set point jitter at zero point due to analog interference, this parameter should be set properly.



Description of Choice: Point A as shown in the figure is the analog value that corresponds to a setpoint that equals 0. It is calculated via analog low , high values and low , high references.  $U_{AB}=U_{AC}=C06.18/2$

C06.19	Function Description	Range	Unit	Default Setting
	Terminal VI Mode	0~1		0

Option: [0] Voltage mode;

[1] Current mode;

Function: Select the input to be present on analog input VI.

### C06.2\*Analog Input 2

C06.20	Function Description	Range	Unit	Default Setting
	Terminal AI Low Voltage	0.00~9.99	V	0.07

Function: This reference signal should correspond to minmum reference/ feedback value set in C06.24.

C06.21	Function Description	Range	Unit	Default Setting
	Terminal AI High Voltage	0.01~10.00	V	10.00

Function: This reference signal should correspond to max. referenc/feedback value set in C06.25.

C06.22	Function Description	Range	Unit	Default Setting
	Terminal AI Low Current	0.00~19.99	mA	0.14

Function: This reference signal should correspond to min. reference /feedback value set in C06.24.

C06.23	Function Description	Range	Unit	Default Setting
	Terminal AI High Current	0.01~20.00	mA	20.00

Function: This reference signal should correspond to max. reference/feedback value set in C06.25.

C06.24	Function Description	Range	Unit	Default Setting
	Terminal AI Low Ref./ Feedb. Value	-4999.000~4999.000		0.000

Function: Enter the reference or feedback value corresponding to min voltage or min current set in C06.20 or C06.22, see drawing in C06.15.

C06.25	Function Description	Range	Unit	Default Setting
	Terminal AI High Ref./Feedb. Value	-4999.000~4999.000		50.000

Function: Enter the reference or feedback value corresponding to max voltage or max current set in C06.21 or C06.23.

C06.26	Function Description	Range	Unit	Default Setting
	Terminal AI Filter Time Constant	0.01~10.00	s	0.01

Function: Set propriate filter time, which can stabilize noise of the analog input AI. The longer the filter,the more stable analog, but response is slower.

C06.28	Function Description	Range	Unit	Default Setting
	Terminal AI Zero Dead Band	0.00~20.00		0.00

Function: Set the dead band for terminal AI at zero, see C06.18.

C06.29	Function Description	Range	Unit	Default Setting
	Terminal AI Zero Dead Band	0.00~20.00	V	0.00

Option: [0] Voltage mode;

[1] Current mode;

Function: Select the input to be present on analog input AI.

### C06.7\*Analog Output VO

C06.70	Function Description	Range	Unit	Default Setting
	Terminal VO Mode	0~3		3

Option: [0] 0-20mA;

[1] 4-20mA;

[3] 0-10V;

Function: Select output to be present on analog output VO.

Attention: This parameter is in relation with the jumper switch, if voltage output is selected, leg1、2 should be asserted on; if current output is selected, leg2、3 should be asserted on.

C06.71	Function Description	Range	Unit	Default Setting
	Terminal VO Analog Output	0~23		0

Option: [0] No operation;

[10] Output frequency,(0-10V)or(0/4-20mA)corresponding to 0-200Hz;

[11] Reference: C03.00 choose“0” [Min. – Max.] , 0% = 0 mA, 100% = 20mA. C03.00 choose“1”[-Max. – Max.] , -100% = 0 mA, 0% = 10mA, +100% = 20 mA;

[12] Feedback,(0-10V)or(0/4-20mA)corresponding to -200% ~ 200%;

[13] Motor current(0-10V)or(0/4-20mA)corresponding to 0-Max motor current, see C16.37;

[16] Power,(0-10V)or(0/4-20mA)corresponding to 0-motor frequency,see C01.20;

[17] Motor speed,(0-10V)or(0/4-20mA)corresponding to 0-motor speed, see C1.25;

[18] Output voltage,(0-10V)or(0/4-20mA)corresponding to 0-motor voltage, see C1.22;

[20] Bus control(0-10V)or(0/4-20mA)corresponding to 0.0% - 100.0%, 100% equals to reference in C03.03;

[21] Pulse input(0-10V)or(0/4-20mA)corresponding to reference from C05.55 to C5.56 transmitted via terminal D14;

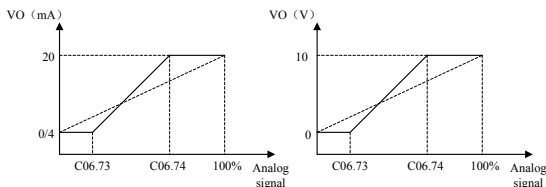
[22] Value on analog inputVI,(0-10V)or(0/4-20mA)corresponding to references from C06.10、C06.12 to C06.11、C06.13;

[23] Value on analog input AI<sub>1</sub>(0-10V)or(0/4-20mA)corresponding to references from C06.20、C06.22 to C06.21、C06.23;

Function: Select choices of the analog output VO.

C06.73	Function Description	Range	Unit	Default Setting
	Terminal VO Output Min Scale	0.00~200.00	%	0.00

Function: Scale minimum output of selected analog signal at terminal VO as percentage of maximum signal value. See fig. below:



C06.74	Function Description	Range	Unit	Default Setting
	Terminal VO Output Max Scale	0.00~200.00	%	100.00

Function: Scale maximum output of selected analog signal at terminal VO as percentage of maximum signal value.

### C06.8\*LCP Potmeter

The LCP potmeter can be select either as reference resource or relative reference resource.

C06.81	Function Description	Range	Unit	Default Setting
	LCP Potmeter Low Ref	-4999.000~4999.000		0.000

Function: This reference value corresponding to potentiometer turned fully counterwise.

C06.82	Function Description	Range	Unit	Default Setting
	LCP Potmeter High Ref	-4999.000~4999.000		50.000

Function: This reference value corresponding to potentiometer turned fully clockwise.

**C06.9\*Analog Output AO**

C06.90	Function Description	Range	Unit	Default Setting
	Terminal AO Mode	0~2		0

Option: [0] 0-20mA;

[1] 4-20mA;

Function: Select the current output signal type of analog output terminal AO.

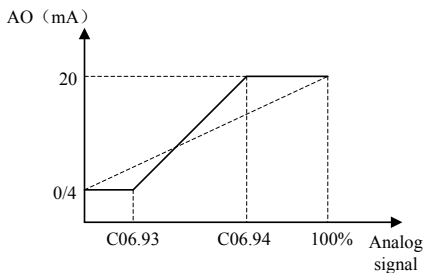
C06.91	Function Description	Range	Unit	Default Setting
	Terminal AO Analog Output	0~23		0

Option: See C06.7I

Function: Select choices of analog output VO.

C06.93	Function Description	Range	Unit	Default Setting
	Terminal AO Output Min. Scale	0.00~200.00		0.00

Function: Scale minimum output of selected analog signal at terminal AO as percentage of maximum signal value. See fig. below:



C06.94	Function Description	Range	Unit	Default Setting
	Terminal AO Output Max. Scale	0.00~200.00		100.00

Function: Scale maximum output of selected analog signal at terminal AO as percentage of maximum signal value.

## 6.8 Parameter Group 07: Controller

### C07.0\*Speed PID Parameters

This parameter is only active in closed loop speed control mode.

C07.02	Function Description	Range	Unit	Default Setting
	Speed PID Proportional Gain	0.000~1.00		0.015

Function: Proportional Gain indicates how many times the fault (deviation between the feedback signal and the setpoint ) to be amplified.

C07.03	Function Description	Range	Unit	Default Setting
	Speed PID Integral Time	2.0~20000.0	ms	8.0

Function: The integral time determines how long the PID regulator takes to correct the error. The greater the error, the quicker the gain increases. The integral time results in a delay of the signal and thus has a dampening effect.

C07.04	Function Description	Range	Unit	Default Setting
	Speed PID Differentiation Time	0.0~200.0	ms	30.0

Function: The differentiator does not react to a constant error. It only provides a gain if the error changes. The quicker the error changes, the stronger the gain from the differentiator will be. The gain is proportional to the speed at which errors change.

C07.05	Function Description	Range	Unit	Default Setting
	Speed PID Diff Gain Time	000~20.000		5.000

Function: It is possible to set a limit for the gain provided by differentiator. Since the D-gain increases at higher frequencies, limiting the gain may be useful.

C07.06	Function Description	Range	Unit	Default Setting
	Speed PID filter Time	1.0~100.0	ms	10.0

Function: Enter a lowpass time desired to dampen oscillations on the feedback signal so as to reduce influence on the system.

*C07.08	Function Description	Range	Unit	Default Setting
	Feed Forward Factor	0~500	%	0

Function: Feed Forward Factor acts an antidampening role to the PID action, setting this parameter to optimize the PID controller.

**C07.2\*Process Ctrl. Feedb**

C07.20	Function Description	Range	Unit	Default Setting
	Process CL Feedback 1	0~11		0

Option: [0] No Function;

[1] Analog in VI(0-10 V、0-20 mA、4-20 mA);

[2] Analog in AI(0-10 V、0-20 mA、4-20 mA);

[8] Pulse input DI4(0.020 – 50.000 KHz);

[11] Local Bus(0 ~ ± 200%);

Function: Select resource of feedback signal.

**C07.3\*Process PI Ctrl**

This parameter is active in closed loop process control mode.

C07.30	Function Description	Range	Unit	Default Setting
	Process PI Normal/Inverse Control	0~1		0

Option: [0] Normal, frequency converter is to reduce/increase the output frequency if the feedback signal is larger/lower than reference;

[1] Inverse, frequency converter is to reduce/increase the output frequency if the feedback signal is larger/lower than reference;

C07.31	Function Description	Range	Unit	Default Setting
	Process PI Anti Windup	0~1		1

Option: [0] Disable, continue regulation of a given error even when the output frequency can't be increased/decreased.

[1] Enable, ceases regulation of a given error when the output frequency can't be increased/decreased.

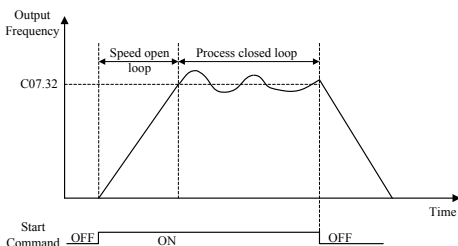
Function: This function ensures the output frequency reaches to frequency limit. PI-controller will be initialized to the current frequency when the output frequency can not be changed. This can prevent the integrator continue to integrate on an error when the PI-controller can't adjust output frequency.

C07.32	Function Description	Range	Unit	Default Setting
	Process PI Start Speed	0.0~200.0	Hz	0.0

Function: Set a appropriate frequency value can improve the start speed of the system. When start command occurs, if the output frequency is lower than this reference, frequency converter will run in speed open loop mode, and when the output frequency reaches up to this reference, it



will perform in Process Control, Closed Loop. Once the drive work in this mode, it will never change even if the output freq. is below the set point.



C07.33	Function Description	Range	Unit	Default Setting
	Process PI Proportional Gain	0.0~10.00	%	0.01

Function: The proportional Gain indicates the number of times the error between the set point and the feedback signal is to be applied. Quick control is obtained by a high gain, but if the gain is too high, the process may become unstable.

Attention: This function is disabled when it is set to "0".

C07.34	Function Description	Range	Unit	Default Setting
	Process PI IntegralTime	0.10~9999.00	s	9999.00

Function: The integral time is the time needed by the integrator to reach the same gain as the porortional gain. Quick control is obtained at a short integral time, however, this time may become too short, which can make the process unstable.

C07.38	Function Description	Range	Unit	Default Setting
	Process PI Feed Forward Factor	0~400	%	0

Function: Feed Forward Factor acts an antidampening role to the PI action, setting this parameter to optimize the PI controller.

C07.39	Function Description	Range	Unit	Default Setting
	On reference Band Width	0~200	%	5

Description of Choice: The PI control error occurs according to the deviation between setpoint and feedback, when the deviation is less than set value in this parameter, On reference Band Width function is active.

C07.41	Function Description	Range	Unit	Default Setting
	Process PI Output Low	-100-100	%	0

Function: Process PI controller output low limit, 100% corresponds to C04I9.

C07.42	Function Description	Range	Unit	Default Setting
	Process PI Output High	-100-100	%	100

Function: Process PI controller output High limit, 100% corresponds to C04I9.

## 6.9 Parameter Group 08: Comm. and Options

### C08.0\*Comm. General Settings

C08.01	Function Description	Range	Unit	Default Setting
	Control mode	0~2		0

Option: [0] Digital and control word , use both digital input and control word as control;

[1] Digital only, use digital input as control;

[2]Control word only, use control word only as control;

C08.02	Function Description	Range	Unit	Default Setting
	Control Word Source	0~1		1

Option: [0] None, control word is inactive;

[1] FC RS485 , select local bus as control word source.

C08.03	Function Description	Range	Unit	Default Setting
	Control Word Time Out Time	0.1~6500.0	s	1.0

Function: This function is disabled, when the reference is set to 0. If the reference is not set to 0, the control word timeout time is not exceeded, and the serial communication is still innormal, action set in C08.04 will be carried out.

C08.04	Function Description	Range	Unit	Default Setting
	Contol Word Time Out Time	0~5		0

Option: [0] Off, No function;

[1] Freeze output,Freeze output until communication resumes.

[2] Stop, Stop with auto restart when communication resumes;

[3] Jogging, Run motor at jog frequency until communication resumes;

[4] Max. speed,Run motor at max.frequency until communication

resumes;

[5] Stop and trip, Stop motor and restart frequency in order to restart via either LCP or Digital input .

Function: Select action to be taken in case of timeout.

C08.06	Function Description	Range	Unit	Default Setting
	Reset Control Word Time Out	0~1		0

Option: [0] No function Control word timeout is not reset;

[1] Do reset Control word timeout is reset;

Function: Resetting control word timeout will remove any timeout function;

### C08.3\*FC Port Setting

C08.30	Function Description	Range	Unit	Default Setting
	Protocol	0~6		0

Option: [0] FC;

[2] MODBUS RTU;

[6] MODBUS ASCII;

Function: Select the protocol to be used.

C08.31	Function Description	Range	Unit	Default Setting
	Address	0~247		1

Function: Select the address for the bus. FC-bus range is 1-126, and MODBUS RTU range is 1-247.

C08.32	Function Description	Range	Unit	Default Setting
	FC Port Baud Rate	0~9	bit/s	2

Option: [0] 2400;

[1] 4800;

[2] 9600;

[3] 19200;

[4] 38400;

[5] Reserved;

[6] Reserved;

[7] Reserved;

[8] Reserved;

[9] Reserved;

Function: Select baud rate for FC Port.

Function Description	Range	Unit	Default Setting
C08.33 FC Port Parity	0~3		2

Option: [0] Even parity(1 stop bit);  
 [1] Odd parity(1 stop bit);  
 [2] No parity(1 stop bit);  
 [3] No parity(2 stop bit);

Function: This parameter only effective for MODBUS RTU and FC bus always has even parity.

Function Description	Range	Unit	Default Setting
C08.35 Min. Response Delay	0.001~0.50	s	0.010

Function: Define the minmum delay time from receiving a request to transmitting the respond out.

Function Description	Range	Unit	Default Setting
C08.36 Max. Response Delay	0.010~10.000	s	5.000

Function: Specify maximum permissible delay time between transmitting a request and receiving a respond. Exceeding this time delay will cause word timeout.

### C08.5\*Digital/Bus

This parameter only active only when C08.01 (control site) is set to (0) digital and control word.

Function Description	Range	Unit	Default Setting
C08.50 Coasting Select	0~3		3

Option: [0] Digital input, Aciviate via a digital input;  
 [1] Bus, Activate via serial communication port;  
 [2] Logic and, Activate via serial communication port and a digital input;  
 [3] Logic or Activate via serial communication port or a digital input;

Function: Select control of coasting function via digital input or bus.

Function Description	Range	Unit	Default Setting
C08.51 Quick Stop Select	0~3		3

Option: [0] Digital input, Aciviate via a digital input;  
 [1] Bus, Activate via serial communication port;  
 [2] Logic and, Activate via serial communication port and a digital input;

[3] Logic or, Activate via serial communication port or a digital input;  
Function: Select control of quick stop function via digital input or bus.

C08.52	Function Description	Range	Unit	Default Setting
	DC Brake Select	0~3		3

Option: [0] Digital input, Activate via a digital input;  
[1] Bus, Activate via serial communication port;  
[2] Logic and, Activate via serial communication port and a digital input;  
[3] Logic or, Activate via serial communication port or a digital input;  
Function: Select control of DC Brake function via digital input or bus.

C08.53	Function Description	Range	Unit	Default Setting
	Start Select	0~3		3

Option: [0] Digital input, Activate via a digital input;  
[1] Bus, Activate via serial communication port;  
[2] Logic and, Activate via serial communication port and a digital input;  
[3] Logic or, Activate via serial communication port or a digital input;  
Function: Select control of Start Select function via digital input or bus.

C08.54	Function Description	Range	Unit	Default Setting
	Reversing Select	0~3		3

Option: [0] Digital input, Activate via a digital input;  
[1] Bus, Activate via serial communication port;  
[2] Logic and, Activate via serial communication port and a digital input;  
[3] Logic or, Activate via serial communication port or a digital input;  
Function: Select control of Reversing Select function via digital input or bus.

C08.55	Function Description	Range	Unit	Default Setting
	Set-up Select	0~3		3

Option: [0] Digital input, Activate via a digital input;  
[1] Bus, Activate via serial communication port;  
[2] Logic and, Activate via serial communication port and a digital input;  
[3] Logic or, Activate via serial communication port or a digital input;  
Function: Select control of Set-up Select function via digital input or bus.

C08.56	Function Description	Range	Unit	Default Setting
	Preset Reference Select	0~3		3

Option: [0] Digital input, Activate via a digital input;  
 [1] Bus, Activate via serial communication port;  
 [2] Logic and, Activate via serial communication port and a digital input;  
 [3] Logic or, Activate via serial communication port or a digital input;  
 Function: Select control of Preset Reference Select function via digital input or bus.

### C08.9\*Bus Jog/Feedback

C08.94	Function Description	Range	Unit	Default Setting
	Bus Feedback 1	-32768~32767		0

Function: Enter the value to be used as bus-feedback. Hex-value 4000H corresponds to 100% feedback/range is +/-200%.

## 6.10 Parameter Group 13: Simple PLC

Simple PLC is a user-defined sequence of operation(CI3.52[x]). When the associated user-defined events (CI3.5[x]) is set to true, Simple PLC will perform these operations.

Events and related operations are paired, that is, once an event is "true", will execute its associated action. You can set up to 30 events and operations.

Start and stop simple PLC: Selected by CI3.00 order or parallel control, when start event (parI30) is "true", start simple PLC, when stop event (CI302) is "true", Simple PLC will be stopped. In addition, you can also choose of [0] (CI300) to stop the simple PLC.

Attention: Simple PLC function is only valid in auto mode.

### CI3.0\*Simple PLC Settings

Use the Sample PLC settings to active, disable or reset simple PLC.

CI3.00	Function Description	Range	Unit	Default Setting
	Sample PLC Mode	0~2		0

Option: [0] \*Disabled;  
 [1] Order Execution;  
 [2] Parallel Execution;  
 Function: Select desired simple PLC control mode.

C13.01	Function Description	Range	Unit	Default Setting
	Start Event	0~54		39

- Option: [0] False, Enter “false” in logic rule;  
 [1] True, Enter “true” in logic rule;  
 [2] Running, For detailed information, please refer to C05.4\*[5];  
 [3] In range-No warning, for detailed information, please refer to C05.4\*[7];  
 [4] On reference-No warning, for detailed information, please refer to C05.4\*[8];  
 [7] Out of current range, for detailed information, please refer to C05.4\*[12];  
 [8] Below I Low, for detailed information, please refer to C05.4\*[13];  
 [9] Above I High, for detailed information, please refer to C05.4\*[14];  
 [10] Out of speed range, for detailed information, please refer to C05.4\*[15];  
 [11] Below speed low, for detailed information, please refer to C05.4\*[16];  
 [12] Above speed high, for detailed information, please refer to C05.4\*[17];  
 [13] Out of feedback range, for detailed information, please refer to C05.4\*[18];  
 [14] Below feedback low, for detailed information, please refer to C05.4\*[19];  
 [15] Above feedback high, for detailed information, please refer to C05.4\*[20];  
 [16] Thermal warning, for detailed information, please refer to C05.4\*[21];  
 [17] Mains out of range, Main power supply voltage exceeds specified voltage range;  
 [18] Reversing, for detailed information, please refer to C05.4\*[25];  
 [19] Warning, if the inverter issues a warning, this event is true;  
 [20] Alarm(trip), if the drive alarms and trip is activated, this event is true;  
 [21] Alarm(trip lock), the drive alarms and trip lock is activated;  
 [22] Comparator 0, output of comparator 0 is used in logic rules;  
 [23] Comparator 1, output of comparator 1 is used in logic rules;  
 [24] Comparator 2, output of comparator 2 is used in logic rules;  
 [25] Comparator 3, output of comparator 3 is used in logic rules;  
 [26] Logic rule 0, result of logic rule 0 is used in logic rules;  
 [27] Logic rule 1, result of logic rule 1 is used in logic rules;  
 [28] Logic rule 2, result of logic rule 2 is used in logic rules;  
 [29] Logic rule 3, result of logic rule 3 is used in logic rules;  
 [30] Simple PLC Time-out 0, result of timer 0 is used in logic rules;

- [31] Simple PLC Time-out 1, result of timer 1 is used in logic rules;
- [32] Simple PLC Time-out 2, result of timer 2 is used in logic rules;
- [33] Digital input FOR, input value entered via digital input FOR is used in logic rules;
- [34] Digital input REV, input value entered via digital input REV is used in logic rules;
- [35] Digital input DI1, input value entered via digital input DI1 is used in logic rules;
- [36] Digital input DI2, input value entered via digital input DI2 is used in logic rules;
- [37] Digital input DI3, input value entered via digital input DI3 is used in logic rules;
- [38] Digital input DI4, input value entered via digital input DI4 is used in logic rules;
- [39] Start command, if the drive starts in any way, this event is “true”;
- [40] Drive stopped, if the drive stops in any way, this event is “true”;
- [50] Simple PLC Time-out 3, result of timer 3 is used in logic rules;
- [51] Simple PLC Time-out 4, result of timer 4 is used in logic rules;
- [52] Simple PLC Time-out 5, result of timer 5 is used in logic rules;
- [53] Simple PLC Time-out 6, result of timer 6 is used in logic rules;
- [54] Simple PLC Time-out 7, result of timer 7 is used in logic rules;

Function: Start Simple PLC.

C13.02	Function Description	Range	Unit	Default Setting
	Stop Event	0~54		40

Option: Same to C13.01.

Function: Stop Simple PLC.

C13.03	Function Description	Range	Unit	Default Setting
	Reset simple PLC	0~1		0

Option: [0] Do not reset, Simple PLC doesn't reset;

- [1] Reset Simple PLC, reset Simple PLC, references in parameter group C13 will all be restored to factory setting;

### C13.1\*Comparators

Comparators are used for comparing continuous variables (e.g. output frequency, output current, analog input etc.) with fixed preset values. In addition, there are some constant value in conjunction with the preset value for comparison, please refer to options in C13.10. In each of the scanning integral the comparator will be evaluated once. And directly use the results(true or false). Parameters in this group are all array-type parameter with index 0-4.



Select 0 to programme Comparator 0, select index 1 to programme Comparator 1, and so on.

C13.10	Function Description	Range	Unit	Default Setting
	Comparator Operand	0~31		0

Array: [4];

Option: [0] Disabled;

[1] Reference [Hz];

[2] Feedback [%], feedback signal (0-10V)or(0/4-20mA)corresponds to -200% ~ 200%;

[3] Motor speed [Hz];

[4] Motor current [A];

[6] Motor power [kW];

[7]Motor Voltage [V];

[12] Analog in VI[%], 100% corresponds to 10V/20mA (depending on your choice is current input or voltage input);

[13] Analog in AI[%], 100% corresponds to 10v/20mA (depending on your choice is current input or voltage input);

[20] Alarm number;

[30] Counter A;

[31] Counter B;

For example: Motor current is 25A, C1310[0]=4, C1312[0]=23, C1311[0]=2, then the output of comparator 0 is true.

C13.11	Function Description	Range	Unit	Default Setting
	Comparator Operator	0~2		1

Array: [4];

Option: [0] Less than, if the variable selected in C1310 is less than the set value in C1312, the comparator output is true, or, false;

[1] Approx. Equal, if the variable selected in C1310 equals the set value in parC1312, the comparator output is true;

[2] Greater than, opposite with option[0];

Function: Select the operator to be used in the comparison .

C13.12	Function Description	Range	Unit	Default Setting
	Comparator Value	-9999.0~9999.0		0.0

### CI3.2\*Timers

Use the timer output to define an event (see CI3.5I) or acts as Boolean inputs of the logic rules (see CI3.40、CI3.42 or CI3.44).

CI3.20	Function Description	Range	Unit	Default Setting
	Simple PLC Timer	0.00~3600.00	s	0.00

Array: [8];

Function: Enter the value to define the duration of the FALSE output from the programmed timer. A timer is only TRUE if it is started by an action and till the timer value has exceeded the set time.

### CI3.4\*Logic Rules

Combine up to three boolean inputs(TRUE or FALSE inputs) from timers、comparators、digital inputs、status bits and events using the logical operators AND、OR and NOT. CI3.40、CI3.42 and CI3.44 are used to select logic rule Booleans, and CI3.4I、CI3.43 is for selecting logic rule operators.

Calculation order: First, select three Boolean inputs from CI3.40、CI3.4I and CI3.42 for the selected logic rule, and then the result (“TRUE or FALSE”) as a logic boolean value, together with other two boolean inputs got from CI3.43 and CI3.44 to obtain the final result of the calculation (“TRUE or FALSE”).

CI3.40	Function Description	Range	Unit	Default Setting
	Logic Rule Boolean 1	0~64		0

Array: [4];

Option: Please refer to CI3.0I;

Function: Select the first boolean(true or false) input for the selected logic rule.

CI3.4I	Function Description	Range	Unit	Default Setting
	Logic Rule Operator 1	0~8		0

Array: [4];

Option: [0] Disabled, ignoring CI3.40 and CI3.42 ;

[1] And, evaluates the expression [CI3.40] AND [CI3.42];

[2] Or, evaluates the expression [CI3.40] OR [CI3.42];

[3] And NOT, evaluates the expression [CI3.40] AND NOT[CI3.42];

[4] OR NOT, evaluates the expression [CI3.40]OR NOT[CI3.42];

[5] NOT AND, evaluates the expression NOT[CI3.40] AND [CI3.42];

[6] NOT OR, evaluates the expression NOT [CI3.40] OR [CI3.42];

[7] NOT AND NOT, evaluates the expression NOT [CI3.40] AND NOT[CI3.42];

[8] NOT OR NOT, evaluates the expression NOT [CI3.40] OR NOT[CI3.42];

Function: Select the first logic operator to be used on the boolean inputs from CI3.40 Logic Rule Boolean 1 and CI3.42 Logic Rule Boolean 2.

C13.42	Function Description	Range	Unit	Default Setting
	Logic Rule Boolean 2	0~64		0

Array: [4];

Option: Please refer to C130;

Function: Select the second Boolean (“TRUE or FALSE”) input for the selected logic rule.

C13.43	Function Description	Range	Unit	Default Setting
	Logic Rule Operator 2	0~8		0

Array: [4];

Option: [0] Disabled, ignoring C1344;

[1] AND, evaluates the expression [C1340/C1342] AND [C1344];

[2] OR, evaluates the expression [C1340/C1342] OR [C1344];

[3] AND NOT, evaluates the expression [C1340/C1342] AND NOT[C1344];

[4] OR NOT, evaluates the expression [C1340/C1342] OR NOT [C1344];

[5] NOT AND, evaluates the expression NOT [C1340/C1342] AND [C1344];

[6] NOT OR, evaluates the expression NOT [C1340/C1342] OR [C1344];

[7] NOT AND NOT, evaluates the expression NOT [C1340/C1342]AND NOT [C1344];

[8] NOT OR NOT, evaluates the expression NOT [C1340/C1342] OR NOT [C1344];

Function: Select the second logic operator to be used on the boolean input calculated in C1340 Logic Rule Boolean 1、C1342 Logic Rule Operator 1 and C1343 Logic Rule Boolean 2 and the boolean input coming from C1344 Logic Rule Boolean 3.

C13.44	Function Description	Range	Unit	Default Setting
	Logic Rule Boolean 3	0~64		0

Array: [4];

Option: Please refer to C130;

Function: Select the third boolean (“TRUE or FALSE”) input for the selected logic rule.

**C13.5\*States**

This group of parameter is used for setting events or actions for Simple PLC.

C13.51	Function Description	Range	Unit	Default Setting
	Simple PLC Event	0~64		0

Array: [30];

Option: Please refer to C130;

Function: Select the boolean input to define the Simple PLC event.

C13.52	Function Description	Range	Unit	Default Setting
	Simple PLC Action	0~69		0

- [1] No action, no action is operated;
- [2] Select set-up 1, select set-up 1 - changes the active set-up to "1";
- [3] Select set-up 2, select set-up 2 - changes the active set-up to "2";
- [0] Select preset ref 0;
- [1] Select preset ref 1;
- [2] Select preset ref 2;
- [3] Select preset ref 3;
- [4] Select preset ref 4;
- [5] Select preset ref 5;
- [6] Select preset ref 6;
- [7] Select preset ref 7;
- [8] Select ramp 1;
- [9] Select ramp 2;
- [20] Select ramp 3;
- [21] Select ramp 4;
- [22] Run, issues a start command to the frequency converter;
- [23] Run reverse, issues a start reverse command to the frequency converter;
- [24] Stop, issues a stop command to the frequency converter;
- [25] Qstop, issues a quick stop command to the frequency converter;
- [26] Dstop, issues a DC stop command to the frequency converter;
- [27] Coast, the frequency converter coasts immediately, all stop commands including the coast command stop the frequency converter;
- [28] Freeze output, freezes the output frequency of the frequency converter;
- [29] Start timer 0;
- [30] Start timer 1;
- [31] Start timer 2;
- [32] Set digital out DOI low;

- [33] Set digital out DO2 low;
- [34] Set relay 1 low;
- [35] Set relay 2 low;
- [36] Set digital out DO3 low;
- [37] Set digital out DO4 low;
- [38] Set digital out DO1 high;
- [39] Set digital out DO2 high;
- [40] Set relay 1 high;
- [41] Set relay 2 high;
- [42] Set digital out DO3 high;
- [43] Set digital out DO4 high;
- [50] Select preset ref 8;
- [51] Select preset ref 9;
- [52] Select preset ref 10;
- [53] Select preset ref 11;
- [54] Select preset ref 12;
- [55] Select preset ref 13;
- [56] Select preset ref 14;
- [57] Select preset ref 15;
- [60] Reset counter A, reset counter A to "0";
- [61] Reset counter B, reset counter B to "0";
- [65] Start timer 3;
- [66] Start timer 4;
- [67] Start timer 5;
- [68] Start timer 6;
- [69] Start timer 7;

Function: Select the action correspondin to the Simple PLC events(C13.5).  
 Actions are executed when the corresponding event is evaluated as true.

## 6.11 Parameter Group 14: Special Functions

C14.01	Function Description	Range	Unit	Default Setting
	Switching Frequency	0~10		4

Option: [2]- [6] 2-6kHz;

- [7] 8kHz;
- [8] 10kHz;
- [9] 12kHz;
- [10] 16kHz;

Description of choice: Switching frequency of the frequency converter has an significate influence to the inverter and the motor. Select appropriate switch frequency can help to adjust acoustic noise from the motor ,

power consumption and the inverter efficiency. When switching frequency increases, the consumption and the noise of the motor are reduced, but the drive's temperature will increase, and motor leakage and the interference to the external device will increase; the contrary the opposite.

*C14.03	Function Description	Range	Unit	Default Setting
	Overmodulation	0~1		1

Option: [0] Off, Disable the overmodulation function to avoid torque ripple on the motor shaft;

[1] On, Connects the overmodulation function to obtain an output voltage up to 15% greater than mains voltage;

Function: This feature allows more accurate speed control near and over normal speed (50/60HZ). Another advantage with overmodulation is the ability of staying at a constant speed even though mains is dropping.

C14.08	Function Description	Range	Unit	Default Setting
	Damping Gain Factor	0~200	%	96

Function: Damping gain factor can help to improve the response speed of the DC link of the frequency converter making the DC loop signal more smooth. The greater the damping factor the slower the response speed, and the smaller the faster.

#### **C14.1\*Mains Monitoring**

C14.12	Function Description	Range	Unit	Default Setting
	Function at Mains Imbalance	0~3		0

Option: [0] Trip, frequency converter trips;

[1] Warning, frequency converter issues a warning (but continues to run);

[2] Disabled, no action is taken;

Function: Select actions when a severe mains imbalance is detected.

C14.16	Function Description	Range	Unit	Default Setting
	Low Voltage Mode	0~1		0

Option: [0] Disabled;

[1] Enable

Function: Select actions when input voltage is lower than normal voltage for external system.

### C14.2\*Trip Reset

C14.20	Function Description	Range	Unit	Default Setting
	Reset Mode	0~13		0

Option: [0] Manual reset, perform reset via [reset]-button or digital inputs;  
 [1]-[10] Auto reset 1-10, performs 1-10 automatic resets after trips;  
 [11] Auto reset11, performs 15 automatic resets after trips;  
 [12] Auto reset12, performs 20 automatic resets after trips;  
 [13] Infinite auto reset, performs an infinite number of automatic resets after tripping;

Function: Select reset function after tripping. Once auto reset is selected, the frequency converter will be restarted after an alarm. If reset have been done and the running signal is active, frequency converter will restart automatically.

Attention: If the auto reset mode is selected, the frequency converter may possibly restart automatically after the alarm disappear.

C14.21	Function Description	Range	Unit	Default Setting
	Automatic Restart Time	0~600	s	10

Function: Enter time interval from trip to start of automatic reset function after a warning/alarm.

Description of Choice: This parameter is active when C14.20,Auto Reset, is set to Automatic reset[1]-[13].

C14.22	Function Description	Range	Unit	Default Setting
	Operation Mode	0~2		0

Option: [0] Normal operation;  
 [2] Initialization, initialise all the parameters except information about the inverter itself and the recorded parameters.

C14.23	Function Description	Range	Unit	Default Setting
	Trip Lock	0~1		1

Option: [0] Disabled; The trip needn't reset by power off  
 [1] Enable; The trip need reset by power off

Function: Select reset mode.

C14.27	Function Description	Range	Unit	Default Setting
	Action At Inverter Fault	0~1		0

Option: [0] Trip, inverter trips if it detects an inverter fault;

[1] Warning, inverter issues an alarm if it detects an inverter fault;

Function: Select how the inverter should react at inverter fault(output short circuit, over-current, earth fault or over-voltage).

Description of choice: If [0] is selected, the inverter issues a warning and trips immediately if it detects an inverter fault; If [1] is selected, when an inverter fault occurs, the inverter issues a warning and stops the PWM outputs, and repeatedly try to open the normal PWM, if the fault still can't be removed, the inverter issues a warning and trips.

#### C14.4\*Energy Optimising

*C14.40	Function Description	Range	Unit	Default Setting
	VT Level	40~90	%	90

Function: Selection of a proper value reduces energy loss in the motor.

*C14.41	Function Description	Range	Unit	Default Setting
	AEO Min. Magnetisation	40~75	%	60

Function: Enter the minimum allowable magnetization for AEO, selection of a low value reduces energy loss in the motor, but can also reduce resistance to sudden load changes, and the output power increases.

#### C14.5\*DC Voltage Compensation

*C14.51	Function Description	Range	Unit	Default Setting
	DC-LinkVoltage Compensation	0~1		1

Option: [0] Disable;

[1] Enable;

Function: The frequency converter includes a feature, which ensures that the output voltage is independent of any voltage fluctuations in the DC link, e.g. caused by fast fluctuations in the mains supply voltage. The benefit is a very steady torque on motor shaft (low torque ripple) under most under most mains conditions. In some cases, this dynamic compensation can cause resonance in DC link and should then be disabled.

*C14.55	Function Description	Range	Unit	Default Setting
	Output Filter	0~3		0

Option: [0] Off;

[1] Sine-wave filter;

[3] Sine-wave filter with feedback;

Function: Select desired output filter.



### C14.6\*Min. Switching Frequency

*C14.63	Function Description	Range	Unit	Default Setting
	Min. Switching Frequency	2~10	KHz	2

Option: [2]- [6] 2-6kHz;

[7] 8kHz;

[8] 10kHz;

[9] 12kHz;

[10] 16kHz;

Function: Enter the minimum switching frequency.

## 6.12 Parameter Group 15: Drive Information

### C15.0\*Operating Data

C15.00	Function Description	Range	Unit	Default Setting
	Operating Days	0~9999	d	

Function: View how many days the drive has run. The value is saved automatically at power off and can't be reset.

C15.01	Function Description	Range	Unit	Default Setting
	Running Hours	0~60000	h	

Function: View how many hours the motor has run . Reset the counter in C1507 Resert Kwh Counter.

C15.02	Function Description	Range	Unit	Default Setting
	KWh Counter(kW)	0~65535	KW	

Function: View the power consumption from mains in Kwh as a mean value over one hour. Reset the counter in C1506.

C15.03	Function Description	Range	Unit	Default Setting
	Power Up's	0~2147483647	KW	

Function: View the number of times the drive has been powered up. This parameter can't be reset.

C15.04	Function Description	Range	Unit	Default Setting
	Over Temperatures	0~65535		

Function: View the number of the drive temperature faults that have occurred. This parameter can't be reset.

Code	Function Description	Range	Unit	Default Setting
C15.05	Over Voltages	0~65535		

Function: view the number of drive overvoltages that have occurred. This parameter can't be reset.

Code	Function Description	Range	Unit	Default Setting
C15.06	Reset Kwh Counter	0~1		

Option: [0] Do not reset;

[1] Reset counter, Counter is reset;

Attention: This parameter can't be set via local bus.

Code	Function Description	Range	Unit	Default Setting
C15.07	Reset Running Hours Counter	0~1		

Option: [0] Do not reset;

[1] Reset conuter Counter is reset;

Attention: This parameter can not be set via local bus.

### C15.3\*Fault Log

Code	Function Description	Range	Unit	Default Setting
C15.30	Fault Log:Error Code	0~255		

Function: This parameter group contains a fault log showing reasons for the ten lastest trips.

Code	Function Description	Range	Unit	Default Setting
C15.31	Internal Fault Reason	-32767~32767		

Function: This parameter contains internal fault reasons, mainly used in conjunction with alarm 38.

### C15.4\*、C15.5\*Drive Identification

This parmeter contains read only information about the hardware and software configuration of the frequency converter.

Code	Function Description	Range	Unit	Default Setting
C15.40	FC Type			

Description of Choice: View FC Type.

Code	Function Description	Range	Unit	Default Setting
C15.41	Power Section			

Description of Choice: View the power size of the frequency converter.

C15.42	Function Description Voltage	Range	Unit	Default Setting
Description of Choice: View the voltage level corresponding to different type of drives.				
C15.43	Function Description Software version	Range	Unit	Default Setting
Description of Choice: View the software version of the drive.				
C15.44	Function Description Ordered Type Code	Range	Unit	Default Setting
Description of Choice: View the ordered type code of the drive.				
C15.46	Function Description FC ordering No.	Range	Unit	Default Setting
C15.47	Function Description Power Card Ordering No	Range	Unit	Default Setting
Description of Choice: View ordering number of the power card.				
C15.48	Function Description LCP IDNo	Range	Unit	Default Setting
Description of Choice: View LCP ID number.				
C15.49	Function Description Software ID Control Card	Range	Unit	Default Setting
Description of Choice: View the control card ID number.				
C15.50	Function Description Software ID Power Card	Range	Unit	Default Setting
Description of Choice: View the power card ID number.				
C15.51	Function Description FC Serial Number	Range	Unit	Default Setting
Description of Choice: View the drives serial number.				

C15.53	Function Description	Range	Unit	Default Setting
	Power Card Serial Number			

Description of Choice: View power card serial number.

#### C15.5\*Defined parameters

C15.92	Function Description	Range	Unit	Default Setting
	Parameter List			

Function: View drive parameters that has been defined .

## 6.13 Parameter Group 16: Data Readouts

This parameter group is read-only

#### C16.0\*General Status

C16.00	Function Description	Range	Unit	Default Setting
	Control Word	0~65535		

Function: View latest valid control word that sent to frequency converter via local bus. Turn it into 16-bit binary code, the following table shows the meaning of corresponding bits:

Communication control word		
Bit	0	1
Bit00	Preset reference bit0	Preset reference bit0
Bit01	Preset reference bit1	Preset reference bit1
Bit02	Dc brake	Ramp
Bit03	Coasting	Not coasting
Bit04	Quick-stop	Ramp
Bit05	Freeze output	Ramp
Bit06	Stop	Start
Bit07	No function	Reset
Bit08	No function	Jogging
Bit09	Ramp 0	Ramp 0
Bit10	Data is invalid	Data is valid
Bit11	Relay 01 is on	Relay 01 acts
Bit12	Relay 02 is on	Relay 02 acts
Bit13	Set-up selection bit0	Set-up selection bit0
Bit14	Undefine	Udefine
Bit15	No function	Reversing

C16.01	Function Description	Range	Unit	Default Setting
	Reference	-4999.000~4999.000		

Function: View the total remote reference, the total reference is sum of pulse, analog, preset, LCP Potmeter, local bus and freeze reference.

C16.02	Function Description	Range	Unit	Default Setting
	Reference(%)	-200.0~200.0	%	

Function: View total remote reference in percentage, , the total reference is sum of pulse, analog, preset, LCP Potmeter, local bus and freeze reference.

C16.03	Function Description	Range	Unit	Default Setting
	Status Word	0~65535		

Function: View active status word, and truned it into a 16-bit binary number . Meanings corresponding to different bits are as follows:

Communication status word		
Bit	0	1
Bit00	Control not ready	Control ready
Bit01	Drive not ready	Drive ready
Bit02	Coasting	Enalbed
Bit03	No error	Trip
Bit04	Error	Error without trip
Bit05	Undefined	Undefined
Bit06	No error	Trip
Bit07	No warning	Warning
Bit08	Not on reference	On reference
Bit09	Local control	Remote control
Bit10	Frequency not in range	Frequency in range
Bit11	Stop	Running
Bit12	Brake resistor is normal	Brake resistor fault
Bit13	Voltage limit	Out of voltage limit
Bit14	Undefined	Undefined
Bit15	No thernal warning	Thermal warning

Function Description	Range	Unit	Default Setting
C16.04 Active Set-up	0~2		

Function: View the drive active set-up. Select 0 indicates set-up 1 , Select 1 indicates set-up 2, and select 2 indicates multi-set-up.

Function Description	Range	Unit	Default Setting
C16.05 Motor Speed[RPM]	0~9999	Hz	

Function: View motor speed.

Function Description	Range	Unit	Default Setting
C16.09 Custom Readout	0.000~9999.00		

Function: View the value of user-defined readout corrected from C00.31 , C00.32 and C04.14 .

For instance: In order to accurately show the motor speed, you need to adjust C00.32 or C04.14 with the following correspondence: C00.32/ C04.14=C0125/C0120.

#### **C16.1\*Motor Status**

Function Description	Range	Unit	Default Setting
C16.10 Power(kW)	0.000~1000.000	kW	

Function: View output power in KW.

Function Description	Range	Unit	Default Setting
C16.11 Power(Hp)	0.000~1000.00	Hp	

Function: View output power in HP, IHP=0.75KW.

Function Description	Range	Unit	Default Setting
C16.12 Motor Voltage	0~65535	V	

Function: View motor phase voltage.

Function Description	Range	Unit	Default Setting
C16.13 Frequency	0.0~400.0	Hz	

Function: View output frequency.

C16.14	Function Description	Range	Unit	Default Setting
	Motor Current	0.00~655.35	A	

Function: View motor phase current.

C16.15	Function Description	Range	Unit	Default Setting
	Frequency(%)	0.0~200.0	%	

Function: View actual output frequency that is set in percentage.

C16.18	Function Description	Range	Unit	Default Setting
	Motor Thermal	0~100	%	

Function: View calculated thermal motor load which is set as percentage of estimated thermal motor load.

### **C16.3\*Drive Status**

C16.30	Function Description	Range	Unit	Default Setting
	DC Link Voltage	0~65535	V	

Function: View DC-link voltage.

C16.34	Function Description	Range	Unit	Default Setting
	Inverter Temp	0~255	°C	

Function: View the temperature of drive's heatsink.

C16.35	Function Description	Range	Unit	Default Setting
	Inverter Thermal	0~255	%	

Function: View calculated inverter thermal load, which is set as a percentage of estimated inverter thermal load.

C16.36	Function Description	Range	Unit	Default Setting
	Inv. Nom. Current	0.00~655.35	A	

Function: View the inverter nominal Current.

C16.37	Function Description	Range	Unit	Default Setting
	Inv.Max. Current	0.00~655.35	A	

Function: View intermittent maximum inverter current.

Code	Function Description	Range	Unit	Default Setting
C16.38	Simple PLC State	0~255		

Function: View the state of the event under execution by the SL Controller.

#### C16.4\*Application Message

Code	Function Description	Range	Unit	Default Setting
C16.40	Wobble Length	0.000~60.000	Km	

#### C16.5\*Ref./Feedb

Code	Function Description	Range	Unit	Default Setting
C16.50	External Reference	-200.0~200.0	%	

Function: View sum of all external references in percent.

Code	Function Description	Range	Unit	Default Setting
C16.51	Pulse Reference	-200.0~200.0	%	

Function: View actual pulse input converted to a renference in percent.

Code	Function Description	Range	Unit	Default Setting
C16.52	Feedback	-4999.000~4999.000		

Function: View analog or pulse feedback in HZ.

#### C16.6\*、C16.7\*Inputs and Outputs

Code	Function Description	Range	Unit	Default Setting
C16.60	Digital Input	0~65535		

Function: View signal states from active digital inputs, which indicates in a 16-bit binary code. If the drive detects digital input terminals connected, the corresponding position is set to "1", otherwise "0". Digital input terminal and the corresponding relationship between the binary code are as below:

Binary	Term. No.	Binary	Term. No.	Binary	Term. No.	Binary	Term. No.
bit0	FOR	bit4	DI3	bit8	DI7	bit12	Reserved
bit1	REV	bit5	DI4	bit9	DI8	bit13	Reserved
bit2	DI1	bit6	DI5	bit10	Reserved	bit14	Reserved
bit3	DI2	bit7	DI6	bit11	Reserved	bit15	Reserved



C16.61	Function Description	Range	Unit	Default Setting
	Terminal VI Setting			0~1

Option: [0] 0-20mA;  
[1] 0-10V;

Function: View actual state of analog input VI.

C16.62	Function Description	Range	Unit	Default Setting
	Analog Input VI	0.00~20.00	V/mA	

Function: View actual input voltage or current value on analog input VI.

C16.63	Function Description	Range	Unit	Default Setting
	Terminal AI Setting	0~1		

Option: [0] 0-20mA;  
[1] 0-10V;

Function: View actual state of analog input AI.

C16.64	Function Description	Range	Unit	Default Setting
	Analog Input AI	0.00~20.00	V/mA	

Function: View actual input voltage or current on analog input AI.

C16.65	Function Description	Range	Unit	Default Setting
	Analog Output AO	0.00~20.00	V/mA	

Function: View actual output voltage or current on analog output AO.

C16.66	Function Description	Range	Unit	Default Setting
	Digital Output	0~255		

Function: View actual state of digital output, which indicates in a 4-bit binary code; If the digital output terminal is active, the corresponding position is set to "1", otherwise "0". Corresponding relationship between state of the digital output terminals and the binary code are as below:

Binary	bit3	bit2	bit1	bit0
Term. No.	Reserved	DO3	DO2	DO1

C16.67	Function Description	Range	Unit	Default Setting
	Encoder input	-9999.000~9999.000	Hz	

Function: View actual input on Encoder input terminal.

C16.68	Function Description	Range	Unit	Default Setting
	Pulse Input DI4	0.020~50.000	KHz	

Function: View input frequency on pulse input terminal DI4

C16.69	Function Description	Range	Unit	Default Setting
	Pulse Output DO1	0.020~50.000	KHz	

Function: View output value on pulse output terminal DO1

C16.71	Function Description	Range	Unit	Default Setting
	Relay Output	0~65535		

Function: View the setting of the relay with a 2-bit binary to represent, if the relay output is active, the corresponding position is set to "1", otherwise set to "0". Relay output with its corresponding relationship between the binary code are as below:

Binary	bit1	bit0
Item. No.	Relay 2	Relay 1

C16.72	Function Description	Range	Unit	Default Setting
	Counter A	0~2147483647		

Function: View present value of counter A .

C16.73	Function Description	Range	Unit	Default Setting
	Counter B	0~2147483647		

Function: View present value of counter B .

C16.78	Function Description	Range	Unit	Default Setting
	Analog Output AO	mA		

Function: View output current in analog output AO .

### C16.8\*Field bus/FC Port

C16.86	Function Description	Range	Unit	Default Setting
	FC Port Reference	-32768~32767		

Function: View the last received reference f from the FC port.

### C16.9\*Diagnosis Readouts

C16.90	Function Description	Range	Unit	Default Setting
	Alarm Word	0~0xFFFFFFFFFUL		

Function: View the alarm word sent via the serial communication port in hex code . Convert this parameter to a 32-bit binary code, definition of the bits in alarm word showed in the table below, among which that reserved by manufacturers are undefined bits:

	/C1690	2 /C1691	Word /c1692	Word 2/c1693
0	Brake check	Undefined	Undefined	Undefined
1	Power card over temp.	Undefined	Power card over temp.	Undefined
2	Earth fault	Trip	Earth fault	Undefined
3	Reserve	Option part	Undefined	Undefined
4	Control card temp	Undefined	Control card temp	Undefined
5	Over current	Undefined	Over current	Undefined
6	Torque limit	Undefined	Undefined	Undefined
7	Motor over thermal	Undefined	Motor over thermal	Undefined
8	Motor over etr	Damaged part	Motor over etr	Damaged part
9	Inverter overload	Undefined	Inverter overload	Undefined
10	Dc under volt	Undefined	Dc under volt	Undefined
11	Dc over volt	Undefined	Dc over volt	Undefined
12	Short circuit	External interlock	Undefined	Undefined
13	Undefined	Undefined	Undefined	Undefined
14	Mains ph. Loss	Undefined	Mains ph. Loss	Undefined
15	Ama error	Undefined	No motor	Undefined
16	Live zero error	Undefined	Live zero error	Undefined
17	Internal fault	Undefined	Undefined	Undefined

18	Brake overload	Fan fault	Brake overload	Fan fault
19	U phase loss	Undefined	Undefined	Undefined
20	V phase loss	Undefined	Undefined	Undefined
21	W phase loss	Undefined	Undefined	Undefined
22	Undefined	Undefined	Undefined	Undefined
23	Control voltage fault	Undefined	Undefined	Undefined
24	Undefined	Undefined	Vdd supply low	Undefined
25	Vdd supply low	Undefined	Current limit	Undefined
26	Brake resistor error	Undefined	Undefined	Undefined
27	Brake transistor fault	Undefined	Undefined	Undefined
28	Bake transistor open circuit	Undefined	Undefined	Undefined
29	Drive initialize	Feedback error	Undefined	Feedback error
30	Undefined	Undefined	Overload do1	Undefined
31	Mech. Brake low	Undefined	Overload do2	Undefined

---

C16.91	Function Description	Range	Unit	Default Setting
	Alarm Word 2	0~0xFFFFFFFFUF		

---

Function: View the Alarm Word sent via serial communication port in hex code.

---

C16.92	Function Description	Range	Unit	Default Setting
	Warning Word 1	0~0x7FFFFFFFUF		

---

Function: View the Warning Word 1 sent via serial communication port in hex code.

---

C16.93	Function Description	Range	Unit	Default Setting
	Warning Word 2	0~0x7FFFFFFFUF		

---

Function: View Warning Word 2 sent via serial communication port in hex code.

## 6.14 Parameter Group 28: Special Application

Lack of air pressure, frequency will be raised automatically.

C28.60	Function Description	Range	Unit	Default Setting
	Current%	0~200	%	0

Set C28.60 = 0, the function will be invalid, the percent will be adjusted according to Motor rated current.

C28.61	Function Description	Range	Unit	Default Setting
	Delay Time	0.0 ~ 20.0	s	10.0

Function: Delay time

C28.62	Function Description	Range	Unit	Default Setting
	Reference Value	0 ~Max reference	HZ	50.0

When motor current is smaller than the value of C28.60 and hold the status during the time of C28.61, Frequency will run according to C28.62.

C28.70	Function Description	Range	Unit	Default Setting
	Power adjust ratio	0~100%	%	100

Function: adjust to displaying ratio for power.

C28.71	Function Description	Range	Unit	Default Setting
	Current adjust ratio	0~100%	%	100

Function: adjust to displaying ratio for current.

C28.80	Function Description	Range	Unit	Default Setting
	Once save energy Kwh	0.0~999.9	Kwh	0

Function: View each saving energy in Kwh.

C28.81	Function Description	Range	Unit	Default Setting
	Total save energy (Kwh)	0.0~999.9	Kwh	0

Function: View total saving energy in Kwh.

C28.82	Function Description	Range	Unit	Default Setting
	Total save energy (Mwh)	0~65535	Mwh	0

Function: View total saving energy in Mwh.

---

C28.83	Function Description	Range	Unit	Default Setting
	Current Price	0.000 ~ 100.000	RMB	0

---

Function: set current price in RMB

---

C28.84	Function Description	Range	Unit	Default Setting
	Total save energy money (RMB)	0.0 ~ 999.9	RMB	0

---

Function: view saving money in RMB

---

C28.85	Function Description	Range	Unit	Default Setting
	Total save energy money(KRMB)	0 ~ 65536	KRMB	0

---

Function: view saving money in KRMB.

---

C28.86	Function Description	Range	Unit	Default Setting
	Motor service ratio	0.10 ~ 100.00		1.00

---

Function: set motor service ratio according to Motor type

---

C28.87	Function Description	Range	Unit	Default Setting
	Compressor Power	0.00 ~ 600.00	KW	Inerter power

---

Function: set motor power according to compressor motor type.

---

C28.88	Function Description	Range	Unit	Default Setting
	Save energy count reset	0, 1	0	0

---

Function: reset value of saving energy , eg: C28.80 , C28.81 , C28.82 , C28.84 , C28.85.

## Chapter 7 Quick Application Guide

### 7.1 Motor Parameter Adaption





1. Parameter initialization(C14.22 =2);
2. Restart the drive;
3. Enter motor nameplate data to C01.20 to C01.25.
4. Choose option [2] of C01.29 to enable AMA.
5. Press “HAND” via LCP or apply start signal via “FOR” terminal in remote control mode to enable AMA, -AT- will be displayed.
6. Wait for the LCP displays “PUSH ENT”, press “ENTER” key, AMA complet.

Description: AMA doesn't need to rotate motor. Measurements are stored in C01.30, C01.33, and C01.35.

### 7.2 Using LCP to control the drive [HAND]

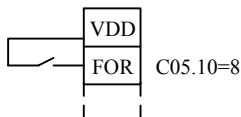
1. Parameter initialization(C14.22=2);
2. Restart the drive;
3. Frequency source: Use potentiometer to set the frequency for LCP with pot;

Use UP/DOWN key (   ) to set the frequency for LCP without pot;

4. Press “HAND” key on LCP to start the frequency converter.
5. Press “OFF/RESET” key on LCP to stop the frequency converter;

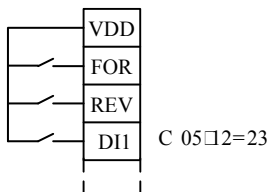
Note: Control panel potentiometer is used as the only source of the frequency converter in HAND mode. (For LCP without potentiometer, use arrow key to set the frequency); Set the lower or upper potentiometer limit via C06.81 and C06.82.

### 7.3 Using digital in terminals to control the drive [AUTO]



1. Parameter initialization(C14.22=2);
2. Press "AUTO" key on LCP (Digital control and communication control are only active in auto mode);
3. Frequency source: Preset C0310 or select frequency source by C0315、C0316、C0317;
4. Connect digital input terminal FOR and VDD to operate the frequency convert;
5. Disconnect the digital input terminal FOR and VDD to stop the frequency converter.

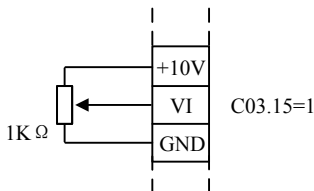
## 7.4 Set-up selection



Select the menu with digital input DI1:

Par. Code	Reference	Parameter Description
C0010	9	Multi Set-up
C0513	23	Set-up select

## 7.5 Potentiometer reference

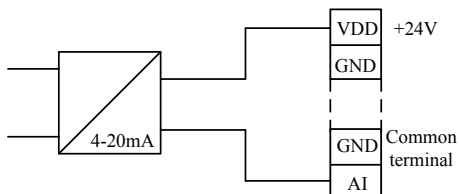




Par. Code	Reference	Parameter Description
C0315	1	Reference resource 1
C0614	**	Terminal VI Low Reference
C0615	**	Terminal VI High Reference

Note:\*\*indicates this parameter is set according to the actual situation.

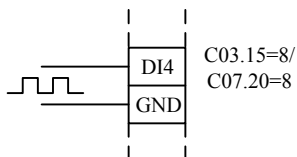
## 7.6 Connect two-wire transducer to terminal AI



Par. Code	Reference	Parameter Description
C0100	3	Process closed loop
C0720	2	Select Analog In AI
C0624	**	Terminal AI Low Ref./Feedb. value
C0625	**	Terminal AI high Ref. / Feedb. value

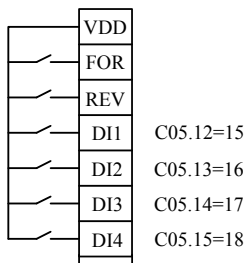
Note: \*\*indicates this parameter is set according to the actual situation.

## 7.7 Reference for pulse input



Par. Code	Reference	Parameter Description
C0315	8	Select reference
C0720	8	Select feedback value
C0515	32	Reference/feedback resource

## 7.8 Multi-speed

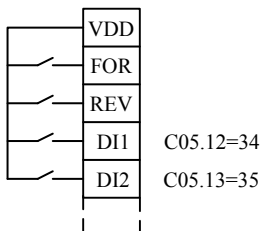


Par. Code	Reference	Parameter Description
C0512	15	Preset reference bit0
C0513	16	Preset reference bit1
C0514	17	Preset reference bit2
C0515	18	Preset reference bit3

Correspondence between speed and the binary code as below:

Bit3	Bit2	Bit1	Bit0	-Speed
0	0	0	0	1
0	0	0	1	2
0	0	1	0	3
0	0	1	1	4
0	1	0	0	5
0	1	0	1	6
0	1	1	0	7
0	1	1	1	8
1	0	0	0	9
1	0	0	1	10
1	0	1	0	11
1	0	1	1	12
1	1	0	0	13
1	1	0	1	14
1	1	1	0	15
1	1	1	1	16

## 7.9 Speed up/down

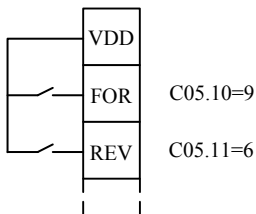


Par. Code	Reference	Parameter Description
C05I2	34	Ramp bit0
C05I3	35	Ramp bit1

Corresponding relation between ramp time and the binary code as below:

Bit1	Bit0	Ramp
0	0	1
0	1	2
1	0	3
1	1	4

## 7.10 Pulse start/stop



Par. Code	Reference	Parameter Description
C05I0	9	Latched start
C05I1	6	Stop inverse

## Chapter 8 Accessory Specification

### 8.1 Remote Mounting Kit

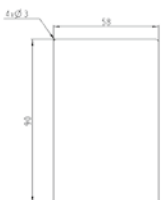
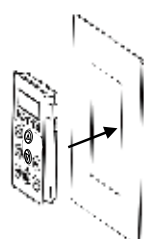
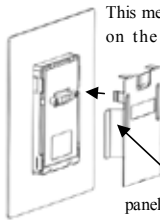

A remote mounting kit for keyboard contains the following 2 items: a fixed metal sheet, HLP-SK180 extension cable.

#### 8.1.1 Communication Cable

Keyboard extension cable has the following specifications: 1m, 2m, 3m, 5m, 7m, 10m, 15m.

#### 8.1.2 Remote Mounting Kit

Our company provides a suit of remote mounting kit, users need only to open a hole in the position where the control panel is to be installed (size as shown), and purchase our mounting kit, you can easily to install. Installation steps are as follows:

 <p>Step 1: Open a hole in line with the size of the control panel in the position need to install the control panel, hole size, as shown:</p>	 <p>Step 2: Install the LCP according to the direction of the arrow.</p>
 <p>This metal sheet applies on the control panel with the thickness of 1.5 mm and bigger. For other thickness panels, fixed the foot of metal sheet manually.</p> <p>Step 3 Install the fixed metal sheet on the back of the control panel in the direction of the arrow.</p>	 <p>Step 4: Install the communication cable and tighten it with screws.</p>

## Chapter 9 EMC

### 9.1 EMC–Correct Installation

HLP-SK180 series drive implement the latest international standards, following these guidelines is advised, IEC/EN61800-3 : 2004 (Adjustable speed electrical power drive systems part 3: EMC requirements and specific test methods). In order to achieve the using requirements of the EMC, must meet the following specifications:

- Using shield motor cables, and connect it to the decoupling device (optional) and the metal motor cabinet;
- To reduce the noise and the leakage current, use the motor cable as short as possible;
- The entire system need to have a good earthing;
- RFI Switch screw must be tightened up.

### 9.2 RFI Switch

Use the RFI switch screw to remove the internal EMC filter, if the frequency converter is supplied from IT or TN Grid . If a drive with EMC filter is connected to the IT grid, then the system may be grounded through the EMC filter capacitors, this may cause damage to the inverter. If a drive with EMC filter is connected to the TN grid, the drive may be burned. Remove the RFI switch can help to reduce the leakage currents.

## Chapter 10 Warnings/Alarms and Fault Handling

### 10.1 Fault List

No. Code	Fault Description	Warning	Alarm	Trip	Error	Reason analysis
2	Live zero error	X	X			Signal on analog input terminal VI or AI is lower than 50% of value set in C06.10、C06.12 and C06.22
3	Motor Loss	X				Motor cable connection problems
4	Mains Phase Loss	X	X	X		Missing phase on supply side or too high voltage imbalance. The allowed power imbalance of HLP-SK180 serials inverter is 3% of the rated voltage.(IEC Standard)
7	Over Voltage	X	X			Intermediate circuit voltage exceeds limit.
8	Under Voltage	X	X			Intermediate circuit voltage drops below “voltage warning low” limit.
9	Inverter Overload	X	X			More than 100% overload for too long time.
10	Motor ETR Over Temperature	X	X			Motor temperature calculated by ETR exceeds upper limit, see C01.90
11	Motor Over Temperature		X			Thermistor damage, uncorrectly installed or motor cooling equipment failure.
12	Torque Limit					Torque exceeds the max. torque limit.
13	Over Current	X	X	X		Inverter peak current limit is exceeded.
14	Earth fault	X	X	X		Discharge from output phases to ground(22KW and below)

No. Code	Fault Description	Warning	Alarm	Trip	Error	Reason analysis
16	Short Circuit		X	X		Short circuit in motor or on motor terminals.
17	Control Word Timeout	X	X			Drive communication timeout, this alarm occurs when C08.04 is set to 0 or 5.
24	Fan Fault	X	X			Too much dust on the fan or the fan is aging.
25	Brake resistor short-circuit		X	X		Brake resistor is short circuit, leading the brake function invalid.
26	Brake Overload	X	X			Beyond the brake power limits
27	Brake transistor short-circuit		X			Brake transistor is short circuit leading brake function invalid.
28	Brake Check		X			Brake resistor is not connected or working.
29	Power Board Over Temp.					Aambient temperature is too high or motor cable is too long.
30	Motor phase U missing		X	X		Motor phase U is missing, check the phase.
31	Motor phase V missing		X	X		Motor phase V is missing, check the phase.
32	Motor phase W missing		X	X		Motor phase W is missing,check the phase.
38	Internal Fault		X	X		Contact the local distributor or Holip Company.
40	DOI Overload	X				Terminal DOI is overload.
41	DO2 Overload	X				Terminal DO2 is overload.
44	Earth Fault		X	X		Discharge from output phases to ground(22KW or more)
47	24V Power Card Fault		X	X		24V voltage power card failure

No. Code	Fault Description	Warning	Alarm	Trip	Error	Reason analysis
48	VDD Low Voltage		X	X		VDD Voltage is too low.
51	AMA check Unom and Inom		X			Motor voltage and motor current error setting.
52	AMA Low Inom		X			Motor current is too low,check the settings.
53	AMA Motor is too large		X			Motor configuration is too large to perform AMA.
54	AMA Motor is too small		X			Motor configuration is too small , unable to perform AMA.
55	AMA Parameter Error		X			Motor parameter is out of the range
56	AMA Interrupt		X			Interrupted by the user when running AMA.
57	AMA Time-out		X			AMA takes too long to run.
58	AMA Internal Error	X	X			Contact Local distributor or Holip Company.
59	Current Limit	X				Current exceeds value set in C04I8.
61	Feedback Error	X	X			Feedback signal is out of range.
63	Mechanical Brake Current Low		X			Actual motor current can not exceeds Release brake current set in C02.20 within start delay time.
66	Heat sink low temperature	X				Temperature may be damaged.
69	Power Card Temp.	X	X	X		Power card is over temperature.
79	Undefined fault	X	X			Contact local distributor or Holip Company.
80	Parameter Initialization		X			Make parameter initialized.



No. Code	Fault Description	Warning	Alarm	Trip	Error	Reason analysis
84	LCP Connection with the inverter failed				X	No communication between LCP and the inverter.
85	Button is disabled				X	Refer to parameter group C04*
89	Parameter read-only				X	Try to write read-only parameter.
90	Parameter Database Busy				X	LCP and RS485 connection try to update a parameter at the same time.
91	Parameter value is invalid in this mode				X	Invalid parameter value to write.
92	Parameter Value Beyond Max./Min. Limit				X	Value try to be set exceeds the limit allowed.
Err	Unchangbale				X	Parameter is freezed or can't be changed during running.

## 10.2 Fault Indication and Trouble Shooting

The inverter of HLP-SK180 series is relatively perfective with protection functions of overload, inter-phase short circuit, earth short circuit, and over-current etc. When a protection function occurs, please check reasons of the faults according to the information listed in the table below. The inverter can be restart after the disposal. If the fault can't be disposed, please contact the distributor or Holip company.

Fault	Process Method
1. Motor runs unsteadily	<p>Motor runs unsteadily but not warnings issued, may be motor parameter settings are not correct, please adjust motor parameter settings, if no effect, please contact Holip Company.</p>
2. Motor can't rotate	<p>Confirm whether the screen display is normal;            If screen display is properly, verify if warning or alarm information displays;            If any warning or alarm occurred, please refer to corresponding troubleshooting section;            If no warning or alarm occurred, please refer to item 5 below;            If there is no screen display, please make sure if the supply voltage is correct;            If the supply voltage is correct, please refer to item 4 below.</p>
3. Motor brake function can't be performed.	<p>Please refer to braking function section;</p>
4. No fault message or screen display	<p>Confirm whether the input fuse meltdown;            Verify whether control card is overload;            Suppose control card is overload, and 24V is shorted, please remove the connection of control terminal;            Make sure if any fault message is displayed, and if no, please contact Holip Company;</p>
5. Motor can't rotate and screen display is normal without fault message	<p>Press [Enter] on LCP;            Make sure whether the screen is active i.e. the screen display can't be switched or parameter can't be edited;            Suppose screen is freezed, please make sure screened cable used and connected correctly;            If operation of the display screen is normal, please make sure connection between motor and the frequency converter is correct and then operate the drive in hand mode. Please contact Holip Company if motor can't rotate.</p>

## Chapter 11 Maintenance

### 11.1 Note

Confirm the main circuit power supply has been turned off, and the display has disappeared before carrying out inspection and maintenance. Make sure the system is in dynamic state, please pay attention to the following:

- Check whether the power supply voltage matches to the rated voltage of the inverter;
- Check whether the motor makes exceptional noises or abnormal vibration when running;
- Check whether there are abnormal heating;
- Check whether the inverter output voltage, output current, output frequency, and monitor display is greater than the value commonly used.
- Check whether the cooling fan installed at the lower part of the inverter runs normally;
- Check whether the ambient temperature is too high and whether there is dust, iron filings, corrosive fluid in the inverter;
- Check whether the ambient temperature of the inverter is between  $-10^{\circ}\text{C}$ ~ $40^{\circ}\text{C}$ , and whether the humidity is between 5%-85%(95% is without condensation), phenomenon of water droplets is not allowed;
- The inverter should be discarded as industrial waste. It is forbidden to burn it;

### 11.2 Storage and Transport

The inverter must be kept in its original package box before installation. Pay attention to the followings when keeping it in storage if the inverter is not used for the time being:

- It must be stored in a dry place without rubbish or dust;
- The suitable temperature for storage is between  $-25^{\circ}\text{C}$ ~ $65^{\circ}\text{C}$ ;
- The relative humidity required is 5%-95% without condensation;
- There is no corrosive gas or liquid in the storage ambience;
- It is better to lay the inverter on a rack and keep it in a proper package;
- The ambient temperature for transport is between  $-25^{\circ}\text{C}$ ~ $70^{\circ}\text{C}$ ;
- The relative humidity of transport ambience must be less than 95%(Ambient temperature is  $40^{\circ}\text{C}$ ).

Attention: It is better not to store the inverter for long time. A long time storage of the inverter will lead to the deterioration of electrolytic capacity. If it needs to be stored for a long time make sure to power it up one time within a year and the power-up time should be at least above five hours. When powering up, supply voltage must be increased slowly with a voltage regulator to the rated voltage value.