HOLIP®

微信公众平台：海利普变频器

HOLIP®

2013-01版  133R0050

r 50.0

HLP-B

HLP–B Series
Operating Manual

HOLIP®

# HLP-B Series Operating Manual

# Index

## Introduction

Thank you for purchasing and using the general-purpose inverter of HLP-B 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.

## Chapter 1 Safety 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

**HOLIP**®

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 dissemble 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  Label Description

HLP-B  www.Holip.com
T/C:  HLP-B0D3721P20ABX1CX0XXXVXXX
P/N: 133F0130    S/N: 869807A248

0.37 kW  0.5 HP
IN:    1x200-240V 50/60Hz 6.1A
OUT:  3x0-Vin 0-400Hz 2.2A
CHASSIS/IP20

O/N: www00064209                    MADE  IN CHINA

CAUTION:
SEE MANUAL
WARNING:
STORED CHARGE DO NOT TOUCH UNTIL 4
MIN. AFTER DISCONNECTION

RISK OF ELECTRIC SHOCK-DUAL SUPPLY
DISCONNECT MAINS AND LOADSHARING
BEFORE SERVICE

## Significance of the type code:

**T/C:HLP-B0D3721P20ABX1CX0XXXVXXX**

| 1-5 | 6-9 | 10-11 12-14 | 15-17 | 18 19 20 21 | 22-24 | 25-28 |

| | | | |
|---|---|---|---|
| 1-5 | HLP-B | Indicate Product Series | |
| 6-9 | 0D37 | Indicate 0.37KW | |
| 10-11 | 21 | Indicate 1-Phase  AC 220V | |
| | 23 | Indicate 3-Phase  AC 220V | |
| | 43 | Indicate 3-Phase  AC 380V | |
| 12-14 | P20 | IP rating is 20 | |
| 15-17 | ABX | Reserved | |
| 18 | X | No control panel | |
| | 1 | Control panel with LED display and potentiometer | |
| | 2 | Control panel with  LED display but not potentiometer | |
| 19 | C | With coating on PCB | |
| 20 | x | Reserved | |
| 21 | 0 | Domestic sale | |
| | 1 | Overseas sale | |
| 22-24 | XXX | Reserved | |
| 25-28 | VXXX | Indicate software version number, such as V235 means  the version number is 2.35 . | |

## 2.2 Particular Specifications

| Model | Input voltage | Input current/ A | Output current/ A | Rated power/ KW | Suitable motor/ KW | Net weight/ KG |
|---|---|---|---|---|---|---|
| HLP-B0D372l | 1×200-240V50/60Hz | 6.1 | 2.2 | 0.37 | 0.37 | 1.72 |
| HLP-B0D752l | 1×200-240V50/60Hz | 11.6 | 4.2 | 0.75 | 0.75 | 1.72 |
| HLP-B01D52l | 1×200-240V50/60Hz | 18.7 | 6.8 | 1.5 | 1.5 | 1.74 |
| HLP-B02D22l | 1×200-240V50/60Hz | 26.4 | 9.6 | 2.2 | 2.2 | 3.2 |
| HLP-B0D3723 | 3×200-240V50/60Hz | 3.5 | 2.2 | 0.37 | 0.37 | 1.72 |
| HLP-B0D7523 | 3×200-240V50/60Hz | 6.7 | 4.2 | 0.75 | 0.75 | 1.74 |
| HLP-B01D523 | 3×200-240V50/60Hz | 10.9 | 6.8 | 1.5 | 1.5 | 1.74 |
| HLP-B02D223 | 3×200-240V50/60Hz | 15.4 | 9.6 | 2.2 | 2.2 | 3.24 |
| HLP-B03D723 | 3×200-240V50/60Hz | 24.3 | 15.2 | 3.7 | 3.7 | 3.28 |
| HLP-B0D7543 | 3×380-440V50/60Hz | 3.5 | 2.2 | 0.75 | 0.75 | 1.68 |
|  | 3×440-480V50/60Hz | 3.0 | 2.1 |  |  |  |
| HLP-B01D543 | 3×380-440V50/60Hz | 5.9 | 3.7 | 1.5 | 1.5 | 1.74 |
|  | 3×440-480V50/60Hz | 5.1 | 3.4 |  |  |  |
| HLP-B02D243 | 3×380-440V50/60Hz | 8.5 | 5.3 | 2.2 | 2.2 | 1.78 |
|  | 3×440-480V50/60Hz | 7.3 | 4.8 |  |  |  |
| HLP-B04D043 | 3×380-440V50/60Hz | 14.4 | 9.0 | 4 | 4 | 3.32 |
|  | 3×440-480V50/60Hz | 12.4 | 8.2 |  |  |  |
| HLP-B05D543 | 3×380-440V50/60Hz | 19.2 | 12.0 | 5.5 | 5.5 | 3.46 |
|  | 3×440-480V50/60Hz | 16.6 | 11.0 |  |  |  |
| HLP-B07D543 | 3×380-440V50/60Hz | 24.8 | 15.5 | 7.5 | 7.5 | 3.52 |
|  | 3×440-480V50/60Hz | 21.4 | 14.0 |  |  |  |
| HLP-B00ll43 | 3×380-440V50/60Hz | 33.0 | 23.0 | 11 | 11 | 5.92 |
|  | 3×440-480V50/60Hz | 29.0 | 21.0 |  |  |  |
| HLP-B00l543 | 3×380-440V50/60Hz | 42.0 | 31.0 | 15 | 15 | 5.92 |
|  | 3×440-480V50/60Hz | 36.0 | 27.0 |  |  |  |
| HLP-Bl8D543 | 3×380-440V50/60Hz | 34.7 | 37.0 | 18.5 | 18.5 | 9.94 |
|  | 3×440-480V50/60Hz | 31.5 | 34.0 |  |  |  |
| HLP-B002243 | 3×380-440V50/60Hz | 41.2 | 43.0 | 22 | 22 | 9.94 |
|  | 3×440-480V50/60Hz | 37.5 | 40.0 |  |  |  |

## 2.3 Technical Specifications

| Item | | Specification |
|---|---|---|
| Power supply | Supply voltage | single/three phase 200-240 V ±l0% ; three phase 380-480 V ±10%; |
| | Frequency | 48-62Hz; |
| | Max. imbalance | 3%; |
| Motor output | Output voltage | three phase 0-l00% of supply voltage; |
| | Output frequency | V/F : 0-400Hz , VVC+: 0-200Hz; |
| Main control functions | Control mode | V/F, VVC+; |
| | Start torque | 0.5Hz 150%; |
| | Overload capacity | 150% rated output current (60s), l80% rated output current(ls); |
| | PWM switch frequency | 2K-l6KHz(default setting is 2K-6KHz); |
| | Speed setting resolution | Digital: 0.00lHz; analogy: 0.5‰ of the max. operating frequency ; |
| | Speed open-loop control accuracy | 30 - 4000 rpm: tolerance±8 rpm; |
| | Speed closed-loop control accuracy | 0 - 6000 rpm: tolerance±0.l5 rpm; |
| | Control command source | LCP , digital terminal, local bus; |
| | Frequency setting source | LCP , analog, pulse, local bus; |
| | Ramp control | Selectable 4-speed steps ramp up and down times 0.05-3600.00s; |
| Basic Functions | | AMA Function; Motor Magnetisation; Slip Compensation; Torque compensation; Automatic Voltage Regulation; V/F Control, DC Brake; AC brake; Speed Limit; Current Limit; Flying Start; Reset Function; Counter; Timer; PI Controller. |
| Application Functions | | Speed Open-loop Control; Speed Closed-loop Control; Process Closed-loop Control; Wobble Function; Cascade controller; Winder; Jogging ; Multi-speed Control via Digital input; Multi-speed Control via Reference; SLC ( including Order Control 、 Parallel Control ) ; Mechanical Braking;UP/DOWN;Catch up /Slow down; Relative Scaling Reference 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; Reference Out of Range; Invalid While Running; Password Error etc. |
| Control Terminals | Digital input | Number | 6 digital inputs, up to 39 different features can be selected. |
| | | 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（DOl、DO2），up to 67 different features can be selected; |
| | | Relay output | 2 relay outputs（KA-KB、FA-FB-FC），up to 67 different features can be selected; |
| | | Scanning time | 1ms; |

| Item | | | Specification |
|---|---|---|---|
| Control Terminals | Analog output | Output number | 2 analog outputs ( VO 、 AO ) , VO can be selected to the current output or voltage output via jumper switch in the control board. AO can only be selected as current output . Up to 11 different features can be selected; |
| | | Output accuracy | Max. error: 4‰ of full scale; |
| | | Resolution | 11bit; |
| | | Scanning time | 16ms; |
| | Pulse output | Output number | 1 pulse output ( DO1 ) , 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 commu-nication | 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; |
| | Data read-outs | | 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, 1-10 fault records and accumulated working time etc.; |

| Item | | | Specification |
|---|---|---|---|
| Accessory | PG card | PG01 | Support open collector output 、 push-pull output and voltage output encoder; |
| | | PG02 | Support long line driver output encoder; |
| | I/O Extend Card | | Extent 4 digital inputs, 2 analog inputs and 1digital output. |
| | Remote mounting kit | | 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 | | 1.14g; |
| | Max. altitude above sea level | | 1000m, derating use when more than 1000 meters; |
| | Motor cable length | | Shield cable: 5 meters, unshield cable: 50 meters; |

**Attention: Inverter under special environment (derating):**

- Derating for ambient temperature: If the frequency converter is operated over 40 ambient temperature, the continuous output current should be decreased. The frequency converter has been designed for operation at max 50 ambient temperation with one motor size smaller than normal. Continuous operation at full load at 50 ambient temperation 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. Dcrease 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 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-B series inverter and one copy of the instruction manual available when unpacking it;
- Check the information on the label 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: with potentiometer and without potentiometer, mounting dimensions of the LCP are as shown below(unit: mm):
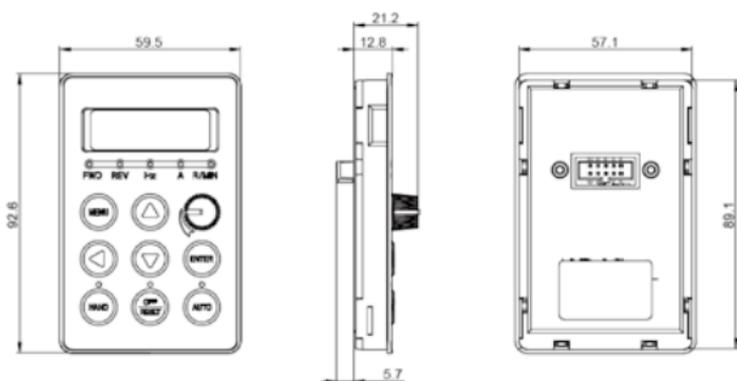
### 3.2.2 Dimensions of the inverter

| Item | Model | Frame size and Installation Dimension |
|------|-------|----------------------------------------|
| Bl | HLP-B0D372l<br>HLP-B0D752l<br>HLP-B0ID52l<br>HLP-B0D3723<br>HLP-B0D7523<br>HLP-B0ID523<br>HLP-B0D7543<br>HLP-B0ID543<br>HLP-B02D243 |  |
| B2 | HLP-B02D22l<br>HLP-B02D223<br>HLP-B03D723<br>HLP-B04D043<br>HLP-B05D543<br>HLP-B07D543 |  |

| Item | Model | Frame size and Installation Dimension |
|------|-------|----------------------------------------|
| B3 | HLP-B001l43<br>HLP-B001543 |  |
| B4 | HLP-Bl8D543<br>HLP-B002243 |  |
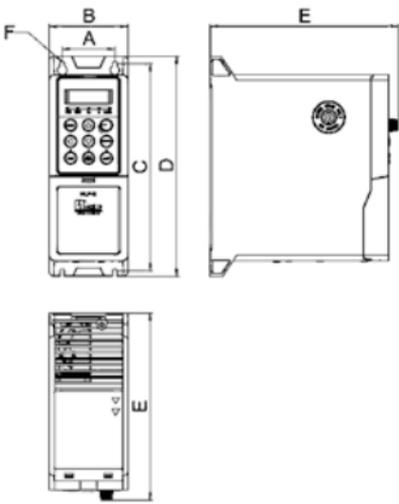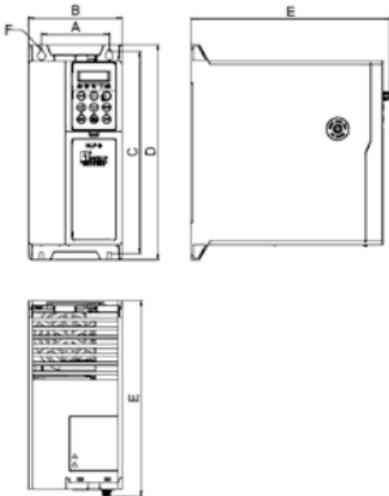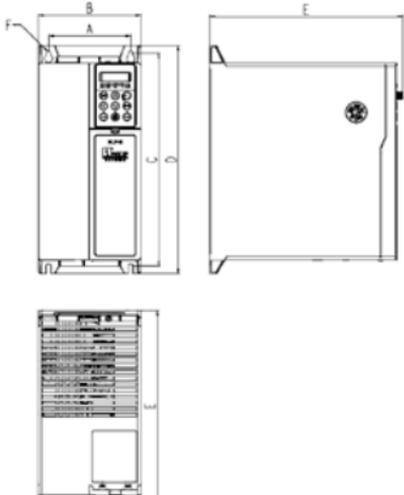
**Installation dimensions of the inverter:**

| Power (KW) and Voltage levels | | | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1×200-240V | 3×200-240V | 3×380-480V | A | B | C | D | E | F |
| 0.37-1.5 | 0.37-1.5 | 0.75-2.2 | 50 | 75 | 198 | 210 | 176 | 4.5 |
| 2.2 | 2.2-3.7 | 4.0-7.5 | 65 | 90 | 241 | 255 | 210 | 4.5 |
| | | 11-15 | 91 | 125 | 275 | 295 | 260 | 5.5 |
| | | 18.5-22 | 120 | 150 | 313 | 335 | 262 | 7 |

## 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, (60-75  ) recommended.

**Details of terminal tightening torques:**

| Power (KW) and Voltage levels | | | Torque (Nm) | | | | |
|---|---|---|---|---|---|---|---|
| 1×200-240V | 3×200-240V | 3×380-480V | Line | Motor | DC connection/ Brake | Control terminals | Relay |
| 0.37-0.75 | 0.37-1.5 | 0.75-4.0 | 1.4 | 0.8 | 0.8 | 0.15-0.4 | 0.4 |
| 1.5-2.2 | 2.2-3.7 | 5.5 | 1.4 | 0.8 | 0.8 | 0.15-0.4 | 0.4 |
| | | 7.5 | 1.4 | 0.8 | 0.8 | 0.15-0.4 | 0.4 |
| | | 11-15 | 1.2 | 1.2 | 1.2 | 0.15-0.4 | 0.4 |
| | | 18.5 | 1.2 | 1.2 | 1.2 | 0.15-0.4 | 0.4 |
| | | 22 | 1.2 | 1.2 | 1.2 | 0.15-0.4 | 0.4 |

### 3.3.2 Fuse Specifications

| Model | Fuse size (Rated current/A) | Model | Fuse size (Rated current/A) |
|---|---|---|---|
| HLP-B0D372l | 10 | HLP-B02D223 | 25 |
| HLP-B0D752l | 25 | HLP-B03D723 | 40 |
| HLP-B0lD52l | 32 | HLP-B04D043 | 25 |
| HLP-B0D3723 | 10 | HLP-B05D543 | 40 |
| HLP-B0D7523 | 16 | HLP-B07D543 | 40 |
| HLP-B0lD523 | 25 | HLP-B00ll43 | 63 |
| HLP-B0D7543 | 10 | HLP-B00l543 | 63 |
| HLP-B0lD543 | 10 | HLP-Bl8D543 | 63 |
| HLP-B02D243 | 16 | HLP-B002243 | 63 |
| HLP-B02D22l | 40 | | |

### 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:

**Side by Side Installation**

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



Min:100 mm

Min:100 mm

Fig.1 Single installation



Min:100 mm

Min:100 mm
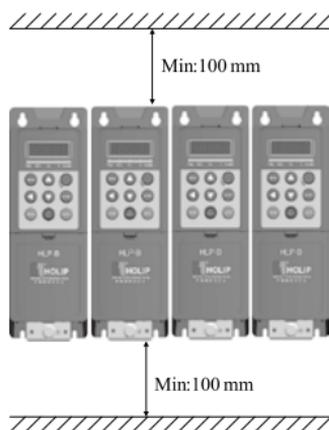
Fig.2 Side by side installation

**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:

Min:100 mm

Min:100 mm

Min:100 mm

Min:100 mm
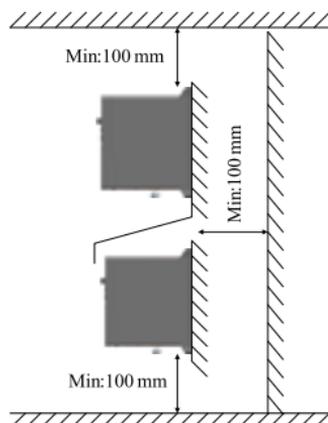
Fig. 3  Upper and Lower installation

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

### 3.3.4  Wiring terminal
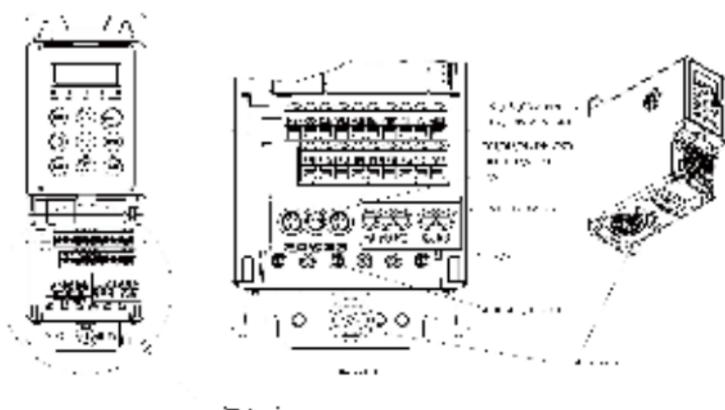


**Note:** The location of the ground terminals is defferent between B3 、 B4 and Bl 、 B2.

### 3.3.4.1 Main Circuit Terminals

**Terminals of the main circuit:**

| R | S | T |
|---|---|---|
| ▭ | ▭ | ▭ |

| -UDC | -BR | +BR/ +UDC | U | V | W | ⏚ |
|---|---|---|---|---|---|---|
| ▭ | ▭ | ▭ | ▭ | ▭ | ▭ | |

**Description of main circuit terminals:**

| Symbol | Function |
|---|---|
| R、S、T | Power input: <br> 220V class: l- phase 200-240V50/60Hz <br> 3- phase 200-240V50/60Hz <br> 380V class: 3- phase 380-480V50/60Hz <br> Single phase connected to R、T |
| U、V、W | Power output, connect to the motor |
| -BR、+BR | Connect the brake resistor, make sure to set C02.l0、C02.ll etc. |
| +UDC、-UDC | DC bus |
| ⏚ | 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 |
|---|---|---|---|---|---|---|---|---|---|
| | ▭ | ▭ | ▭ | ▭ | ▭ | ▭ | ▭ | ▭ | ▭ |

**Relay terminals:**

| FA | FB | FC | KA | KB |
|----|----|----|----|----|
| ▭ | ▭ | ▭ | ▭ | ▭ |

**Description of I/O control terminals:**

| Symbol | Description | Specification |
|--------|-------------|---------------|
| VDD | 24Vpower supply | Max.load 50mA, with over load and short circuit protection functions; |
| 10V | 10V power supply | Max.load 25 mA, with over load and short circuit protection functions; |
| Digital input (FOR、REV、DI1、DI2、DI3、DI4) | Digital control terminals | 1、Logic:<br>PNP  <DC5V        logic '0';<br>          >DC10V       logic '1';<br>NPN >DC19V       logic '0';<br>          <DC14V       logic '1';<br>2、Voltage: DC 0-24V;<br>3、Input resistance: 4KΩ;<br>4、Input voltage rang: max ±28V; It can bear 10 seconds when the voltage is ±37V.<br>5、When DI4 is defined as the motor thermal protection signal, PTC resistance:<br>- Fault : >2.9 KΩ;<br>- Normal: <800Ω; |
| Analog input (VI、AI) | Analog setting/ Feedback | Set by the related parameter, analog input channel can be configurated to 0-20mA or 0-10V:<br>Voltage input:<br>1、Input impedance: about 10 KΩ;<br>2、Maximum withstand voltage is 20V, duration of 2 seconds, the maximum reverse voltage is -15V , duration of 2seconds.<br>Current input:<br>1、Input impedence≤500Ω;<br>2、Maximum withstand current is 29 mA duration of 2 seconds. |

| Symbol | Description | Specification |
|--------|-------------|---------------|
| Pulse input DI4 | Pulse setting/ Feedback | 1、Pulse input: 0.020-50.000KHz; <br> 2、Voltage range: 24V ± 20%; <br> 3、Input duty ratio: 40%-60%; |
| Digital output (DO1、 DO2) | Digital output | 1、Output voltage range: 0-24V; <br> 2、Output current range: 0-50mA; <br> 3、Max. resistant load:600Ω; <br> 4、The software is configured to PNP or NPN output. |
| Analog output (VO、AO) | Analog output | VO can be selected to the current output or voltage output via jumper switch in the control board. AO can only be selected as current output: <br> 1、Output mode: 0-20mA or 0-l0V; <br> 2、Voltage output: Load larger than 500Ω; <br> 3、Current output: Load larger than 500Ω; |
| Pulse output DO1 | Pulse output | DO1 can also be configured as pulse output channels: <br> 1、Pulse output range: 0.020-50.000KHz; <br> 2、Voltage range: 0-24V; <br> 3、Duty ratio: 40%-60%; <br> 4、Resistive load >1kΩ, capacitive load < 10nF; |
| GND | Digital or Analog ground | Isolated from internal COM; |
| Relay output (KA-KB, FA-FB-FC) | Relay output | 1、Resistive load: 250VAC 3A/30VDC 3A; <br> 2、Inductive load: 250VAC 0.2A/24VDC 0.1A (cosφ=0.4); |
| RS485 | RS485 comm-unication | 485 + and 485- ; |
| COM | Ground for communica-tion | Isolated from internal GND; |

### 3.3.5 Wiring

Basic Connection Diagram of HLP-B series inverter:
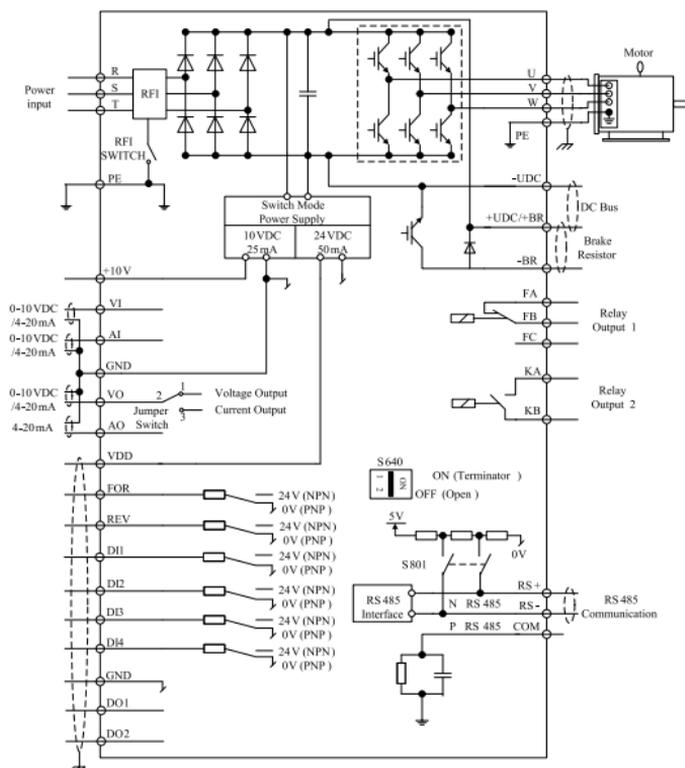


**Precautions for the main circuit wiring:**

- 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 3.5 mA. According to the requirments of IEC 61800-5-1 , must use the following ways to enhance the protection of ground: minimum 10mm2 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
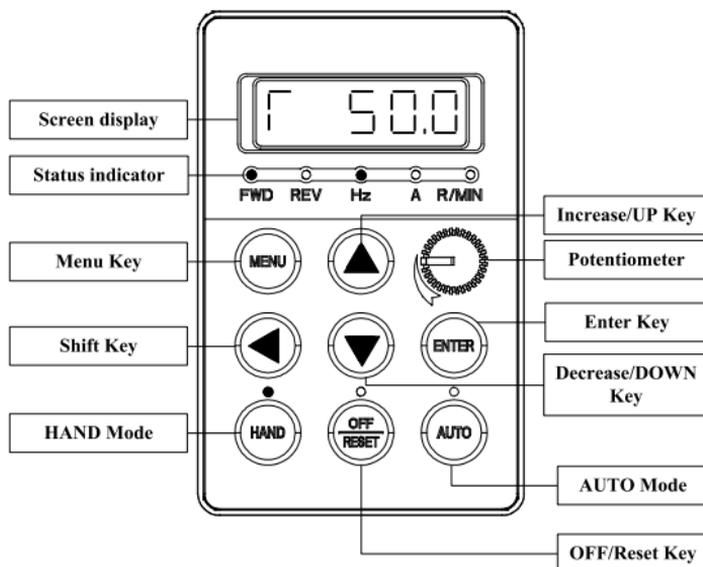


## 4.2 Quick to set parameters

### 4.2.1 Preset reference by LCP

**Example:** Set a reference to10.25 That is C03.10 [0] =20.5:

| Key-press | LCP Display | Action Description |
|-----------|-------------|--------------------|
| MENU | C00.03 | Press (MENU) 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 |

| Key-press | LCP Display | Action Description |
|-----------|-------------|--------------------|
| ▼ ▲ | C03.10 | Press ▼ ▲ key to select parameter C03.10 |
| ENTER | [0] | Press ENTER key show the first option of C03.10 |
| ENTER | 0000 | Press ENTER 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 |
| ENTER | END | Press ENTER 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 |
|-----------|----------------|-------------------|
| ≥0 | STOP | ☀ ○ <br> FWD REV |
| <0 | STOP | ○ ☀ <br> FWD REV |

| Reference | Running status | Indicator Display |
|---|---|---|
| ≥0 | FWD | ● ○<br>FWD REV |
| ≥0 | REV | ☀ ●<br>FWD REV |
| ⊲0 | FWD | ● ☀<br>FWD REV |
| ⊲0 | REV | ○ ●<br>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 dirve 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 Data Read-outs

| Display Items | Key-press | LCP Display | Action Description |
|---|---|---|---|
| Output Frequency | Initial interface | ⌐ 50.0<br>● ○ ● ○ ○<br>FWD REV HZ A R/MIN | Show the output frequency (Cl6.l3) is 50.0Hz, display accuracy : 0.l |
| Reference (%) | ◀ | 50.00<br>● ○ ● ● ○<br>FWD REV HZ A R/MIN | Show the preset reference (Cl6.0l) is 50%, display accuracy: 0.00l |
| Motor Current | ◀ | A 9.00<br>● ○ ○ ● ○<br>FWD REV HZ A R/MIN | Show the motor current (Cl6.l4) is 9.00A, display accuracy: 0.0l |

| Display Items | Key-press | LCP Display | Action Description |
|---|---|---|---|
| Motor Voltage | ◀ | **380.0** <br> ●FWD ○REV ●HZ ○A ○R/MIN | Show the motor voltage (Cl6.12) is 380.0V, display accuracy: 0.1 |
| Motor Speed | ◀ | **1 1440** <br> ●FWD ○REV ○HZ ○A ●R/MIN | Show the motor speed (Cl6.05) is 1440rpm, display accuracy:1 |
| DC Voltage | ◀ | **540.0** <br> ●FWD ○REV ○HZ ●A ●R/MIN | Show the DC voltage(Cl6.30) is 540.0V, display accuracy: 0.1 |
| Inverter temperature | ◀ | **45** <br> ●FWD ○REV ○HZ ○A ●R/MIN | Show the inverter temperature (parCl6.34) is 45  , display accuracy:1 |
| Feedback Value | ◀ | **28.000** <br> ●FWD ○REV ●HZ ○A ●R/MIN | Show the feedback value(Cl6.52) is 28.000, display accuracy: 0.001 |
| Counter A | ◀ | **65535** <br> ●FWD ○REV ○HZ ●A ●R/MIN | Show value of counter A is (Cl6.72) 65535, display accuracy : 1 |
| Counter B | ◀ | **65535** <br> ●FWD ●REV ●HZ ●A ●R/MIN | Show counter B(Cl6.72) is 65535, diaplay accuracy : 1 |
| Analog in VI | ◀ | **10.00** <br> ●FWD ○REV ●HZ ○A ●R/MIN | Show analog in VI (Cl6.62) is 10.00V, display accuracy: 0.01 |

| Display Items | Key-press | LCP Display | Action Description |
|---------------|-----------|-------------|--------------------|
| Analog in AI | ◀ | **20.00**<br>● ○ FWD REV HZ A R/MIN | Show Analog in AI (Cl6.63) is 20.00mA, display accuracy: 0.0l |
| Pulse Input | ◀ | **50000**<br>● ○ ○ FWD REV HZ A R/MIN | Show pulse input (Cl6.68) is 50000Hz, display accuracy:l |
| Pulse Output | ◀ | **50000**<br>● ○ ● FWD REV HZ A R/MIN | Show pulse output (Cl6.69) is 50000Hz, display accuracy: 1 |
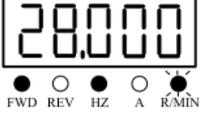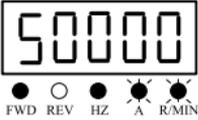
**Note:** Press ◀ key to change the display items on control panel, however, C00.33 must be activated (see C00.33).

### 4.2.4 View alarm record

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

| Key-press | LCP Display | Action Description |
|-----------|-------------|--------------------|
| MENU | C00.03 | Press (MENU) key to display the first basic C00.03. |
| ▼▲ | Cl5.00 | Press ▼▲ to select par. group No. Cl5. |
| ◀ | Cl5.00 | Press ◀ to select parameter number. |
| ▼▲ | Cl5.30 | Press ▼▲ to select Cl5.30 |

| Key-press | LCP Display | Action Description |
|-----------|-------------|--------------------|
| (ENTER) | [0] | Press (ENTER) to show the first option of Cl5.30 |
| (ENTER) | ** | Press (ENTER) to show the first fault record. |
| (ENTER) | [l] | Press (ENTER) to show the second fault record, it can display up to 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 |
|-----------|-------------|--------------------|
| (MENU) | C00.03 | Press (MENU) to display the first basic parameter C00.03. |
| (▼)(▲) | Cl6.00 | Press (▼)(▲) to select Par. group No. Cl6 |
| (◀) | Cl6.00 | Press (◀) to select parameter No. |
| (▼)(▲) | Cl6.0l | Press (▼)(▲) select Cl6.0l |
| (ENTER) | 0 | Press (ENTER) to finish browse value of Cl6.0l. |

| Key-press | LCP Display | Action Description |
|---|---|---|
| (▼)(▲) | C16.60 | Press (▼)(▲) to select C16.60. |
| (ENTER) | 0000 | Press (ENTER) to view the value in C16.60, 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 |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| A | B | C | D | E | F | G | H | I | J |
| A | b | C | d | E | F | G | H | I | J |
| K | L | M | N | O | P | Q | R | S | T |
|  | L | | N | O | P | q | r | S | T |
| U | V | W | X | Y | Z | − | + | . | = |
| U | U | | | Y | Z | - | + | . | = |
| a | b | c | d | e | f | g | h | i | j |
| A | b | c | d | E | F | g | h | I | J |
| k | l | m | n | o | p | q | r | s | t |
|  | L | | n | o | P | q | r | S | t |
| u | v | w | x | y | z |  |  |  |  |
| u | u | | | Y | Z | | | | |

# Chapter 5 Parameter Overview

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| | *C00.03 | Regional Settings | 0: 50 Hz; 1: 60 Hz; | | 0 | 54 |
| | C00.04 | Operating State at Power-up | 0: Resume;1: Forced stop reference=old; 2: Forced stop reference=0; | | 1 | 54 |
| | *C00.06 | Grid Type | 0-132 | | * | 55 |
| | C00.10 | Active Set-up | 1: Set-up1; 2: Set-up2; 9: Multi set-up; | | 1 | 55 |
| | C00.11 | Edit Set-up | 1: Set-up1; 2: Set-up2; | | 1 | 56 |
| | *C00.12 | Link Set-up | 0: Not linked; 20: Linked; | | 20 | 56 |
| | C00.31 | Custom Readout Min Value | 0.00-9999.00 | | 0.00 | 56 |
| | C00.32 | Custom Readout Max Value | 0.00-9999.00 | | 100.00 | 57 |
| Parameter Group 00 Operation/Display | C00.33 | LCP Display Option | 0-2047 | | 0 | 57 |
| | C00.40 | [HAND ON] key on LCP | 0: Disabled; 1: Enabled; | | 1 | 57 |
| | C00.41 | [OFF/RESET] key on LCP | 0: Disable All; 1: Enable All; 2: Enable Reset Only; | | 1 | 58 |
| | C00.42 | [AUTO] key on LCP | 0: Disabled; 1: Enabled; | | 1 | 58 |
| | *C00.51 | Set-up Copy | 0: No copy; 1: Copy from set-up1; 2: Copy from set-up2; 9: Copy from factory set-up; | | 0 | 58 |
| | C00.60 | Menu Password | 0: Disabled; 1: Enabled; | | 0 | 58 |
| | C01.00 | Configuration Mode | 0: Speed open loop; 1: Speed closed loop; 3: Process closed loop; | | 0 | 59 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| Parameter Group01 Load/motor | *C01.01 | Motor Control Principle | 0: U/F; 1: VCC+; | | 1 | 59 |
| | *C01.03 | Torque Characteristics | 0: Constant torque; 1: Mutative; 3: Energy optim; | | 0 | 59 |
| | *C01.07 | Application Configuration Mode | 0: No Function; 1: Wobble Function; 2: Cascade Control; 3: Winder Function; | | 0 | 60 |
| | *C01.20 | Motor Power [kW][HP] | Dep.on motor data | kW | * | 60 |
| | *C01.22 | Motor Voltage (Um.n) | 50~1000 | V | * | 60 |
| | *C01.23 | Motor Frequency (f.m.n) | 20~400 | Hz | * | 61 |
| | *C01.24 | Motor Current(Im.n) | Dep.on motor data | A | * | 61 |
| | *C01.25 | Motor Nominal Speed(nm.n) | 100~9999 | rpm | * | 61 |
| | *C01.29 | Automatic Motor Adaptation (AMA) | 0: Off; 1: Enabled Complete AMA; 2: Enable Reduced AMA; | | 0 | 61 |
| | *C01.30 | Stator Resistance (Rs) | Dep.on motor data | Ω | * | 62 |
| | *C01.33 | Stator Leakage Reactance (Xl) | Dep.on motor data | Ω | * | 62 |
| | *C01.35 | Main Reactance (Xh) | Dep.on motor data | Ω | * | 62 |
| | *C01.39 | Motor poles | 2~100 | P | 4 | 62 |
| | *C01.42 | Motor Cable Length | 0~150 | m | 50 | 62 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group 01 Load/motor | C01.50 | Motor Magnetisation at Zero Speed | 0~300 | % | 100 | 63 |
| | C01.52 | Min Speed Normal Magnetising [Hz] | 0.0~10.0 | Hz | 0.0 | 63 |
| | C01.55 | U/F Characte-ristic-U | 0~999 | V | | 63 |
| | C01.56 | U/F Characte-ristic-F | 0~400 | Hz | | 64 |
| | C01.60 | Low Speed Load Compensation | 0~199 | % | 100 | 64 |
| | C01.61 | High Speed Load Compensation | 0~199 | % | 100 | 65 |
| | C01.62 | Slip Compensation | -400~399 | % | 100 | 65 |
| | C01.63 | Slip Compensation Time Constant | 0.05~5.00 | s | 0.10 | 66 |
| | C01.64 | Resonance Dampening | 0~500 | % | 50 | 66 |
| | C01.65 | Resonance Dampening Time Constant | 0.005~0.050 | s | 0.005 | 66 |
| | C01.71 | Start Delay | 0.0~10.0 | s | 0.0 | 66 |
| | C01.72 | Start Function | 0: DC hold/delay time; 2: Coast/Delay time; | | 2 | 66 |
| | *C01.73 | Flying start | 0: Disabled; 1: Enabled; | | 0 | 67 |
| | C01.80 | Function at Stop | 0: Coast; 1: DC Hold; | | 0 | 67 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| | C01.82 | Min Speed for Function at Stop [Hz] | 0.0~20.0 | Hz | 0.0 | 68 |
| | C01.90 | Motor Thermal Protection | 0: No Protection; 1: Thermister Warning; 2: Termister Trip; 3: ETR warning; 4: ETR trip; | | 0 | 68 |
| | *C01.93 | Thermister Resource | 0: None; 1: Analog input VI; 6: Digital input DI4; | | 0 | 68 |
| Parameter Group 02 Brake Function | C02.00 | DC Hold Current | 0~150 | % | 50 | 69 |
| | C02.01 | DC Brake Current | 0~150 | % | 50 | 69 |
| | C02.02 | DC Braking Time | 0.0~60.0 | s | 10.0 | 70 |
| | C02.04 | DC Brake Cut In Frequency | 0.0~400.0 | Hz | 0.0 | 70 |
| | C02.10 | Brake Function | 0: Off; 1: Resistor brake; 2: AC brake; | | 0 | 70 |
| | C02.11 | Brake Resistor (ohm) | Dep.on motor data | Ω | * | 70 |
| | C02.16 | AC Brake, Max current | 0~150 | % | 100 | 70 |
| | C02.17 | Over-voltage Control | 0: Disabled; 2: Enabled; | | 0 | 71 |
| | C02.20 | Release Brake Current | 0.00~100.00 | A | 0.00 | 71 |
| | C02.22 | Activate Brake Speed [Hz] | 0.0~400.0 | Hz | 0.0 | 71 |
| | C03.00 | Reference Range | 0: Min-Max; 1: -Max-+Max; | | 0 | 72 |
| | C03.02 | Minimum Reference | -4999.000~4999.000 | | 0.000 | 72 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group 03: Reference/Ramps | C03.03 | Maximum Reference | -4999.000~4999.000 | | 50.000 | 72 |
| | C03.10 | Preset Reference | -100.00~100.00 | % | 0.00 | 73 |
| | C03.11 | Jog Speed [Hz] | 0.0~400.0 | Hz | 5.0 | 74 |
| | C03.12 | Catch up/slow Down Value | 0.00~100.00 | % | 0.00 | 74 |
| | C03.13 | SpeedUp/Down Value | 0.01~50.00 | Hz | 0.10 | 74 |
| | C03.14 | Preset Relative Reference | -100.00~100.00 | % | 0.00 | 75 |
| | C03.15 | Reference Resource 1 | 0: No function; 1: Analog input VI; 2: Analog Input AI; 8: Pulse input; 11: Local bus ref; 21: LCP potentiometer; | | 1 | 75 |
| | C03.16 | Reference Resource 2 | | | 2 | 75 |
| | C03.17 | Reference Resource 3 | | | 11 | 75 |
| | C03.18 | Relative Scaling Reference Resource | | | 0 | 76 |
| | C03.19 | Save Speed Up/Down Value | 0: No function; 1: Stopsave; 2: Power down save; | | 0 | 76 |
| | C03.40 | Ramp 1 Type | 0: Linear; 2: Sine2 ramp; | | 0 | 76 |
| | C03.41 | Ramp 1 Ramp up Time | 0.05~3600.00 | s | * | 77 |
| | C03.42 | Ramp 1 Ramp Down Time | 0.05~3600.00 | s | * | 78 |
| | C03.50 | Ramp 2 Type | 0: Linear; 2: Sine2 ramp; | | 0 | 78 |
| | C03.51 | Ramp 2 Ramp up Time | 0.05~3600.00 | s | * | 78 |
| | C03.52 | Ramp 2 Ramp down Time | 0.05~3600.00 | s | * | 79 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|--------------|--------------------|--------------| -----|----------------|----------|
| Parameter Group 03 Reference/Ramps | C03.60 | Ramp 3 Type | 0: Linear; 2: Sine2 ramp; | | 0 | 79 |
| | C03.61 | Ramp 3 Ramp up Time | 0.05~3600.00 | s | * | 79 |
| | C03.62 | Ramp 3 Ramp down Time | 0.05~3600.00 | s | * | 79 |
| | C03.70 | Ramp 4 Type | 0: Linear; 2: Sine2 ramp; | | 0 | 80 |
| | C03.71 | Ramp 4 Ramp up Time | 0.05~3600.00 | s | * | 80 |
| | C03.72 | Ramp 4 Ramp down Time | 0.05~3600.00 | s | * | 80 |
| | C03.80 | Jog Ramp Time | 0.05~3600.00 | s | * | 80 |
| | C03.81 | Quick Stop Ramp Time | 0.05~3600.00 | s | * | 80 |
| Parameter Group 04: Limits/Warnings | *C04.10 | Motor Speed Direction | 0: Clockwise; 1: Counterclockwise; 2: Both; | | 2 | 81 |
| | *C04.12 | Motor Speed Low Limit [Hz] | 0.0~400.0 | Hz | 0.0 | 81 |
| | *C04.14 | Motor Speed High Limit [Hz] | 0.0~400.0 | Hz | 65.0 | 81 |
| | C04.18 | Current Limit | 0~300 | % | 150 | 81 |
| | *C04.19 | Max. Output Frenquency | 0.0~400.0 | Hz | 65.0 | 82 |
| | C04.30 | Motor Feedback Loss function | 0: No function; 1: Freeze output; 3: Jog; 4: Max. Speed; 5: Stop and trip; 11: Switch to open loop; | | 4 | 82 |
| | C04.31 | Motor Feedback Speed Error | 0~600 | rpm | 300 | 82 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| Parameter Group 04: Limits/ Warnings | C04.32 | Motor Feedback Loss Timeout | 0.00~60.00 | s | 0.05 | 82 |
| | C04.50 | Warning Current Low | 0.00~Imax | A | 0.00 | 83 |
| | C04.5l | Warning Current High | 0.00~Imax | A | | 83 |
| | C04.52 | Warning Speed Low | 0.0~400.0 | Hz | 0.0 | 83 |
| | C04.53 | Warning Speed High | 0.l~400.0 | Hz | 65.0 | 83 |
| | C04.54 | Warning Reference Low | -4999.000~4999.000 | | 0.000 | 83 |
| | C04.55 | Warning Reference High | -4999.000~4999.000 | | 50.000 | 84 |
| | C04.56 | Warning Feedback Low | -4999.000~4999.000 | | 0.000 | 84 |
| | C04.57 | Warning Feedback High | -4999.000~4999.000 | | 50.000 | 84 |
| | *C04.58 | Missing Motor Phase Function | 0: Off; l: On; | | 1 | 84 |
| | C04.6l | Bypass Speed From [Hz] | 0.0~400.0 | Hz | 0.0 | 84 |
| | C04.63 | Bypass Speed To [HZ] | 0.0~400.0 | Hz | 0.0 | 85 |
| | *C05.00 | Digital Input Mode | 0: PNP; l: NPN; | | 0 | 85 |
| | *C05.0l | Digital Input DI4 Mode | 0: PNP; l: NPN; | | 0 | 85 |
| | *C05.02 | Digital Output DO Mode | 0: PNP; l: NPN; | | 0 | 86 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| Parameter Group 05: Digital In/Out | C05.10 | Terminal FOR Digital Input | 0: No operation; 1: Reset; 2: Coast inverse; 3: Coast and reset inverse; 4: Quick stop inverse; 5: DC-brake inverse; 6: Stop inverse; | | 8 | 86 |
| | C05.11 | Terminal REV 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; | | 10 | 86 |
| | C05.12 | Terminal DI1 Dgital Input | 16: Preset ref bit1; 17: Preset ref bit2; 18: Preset ref bit3; 19: Freeze reference; 20: Freeze output; 21: Speed up; | | 15 | 86 |
| | C05.13 | Terminal DI2 Digital Input | 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; | | 16 | 86 |
| | C05.14 | Terminal DI3 Digital Input | 60: CounterA (up); 62: Reset counterA; 63: CounterB (up); 65: Reset counterB; 70: Wobble start command; 71: Wobble reset; 72: Wobble initialization; | | 17 | 86 |
| | C05.15 | Terminal DI4 Digital or Pulse Input | 90: Low water level; 91: High water level; 92: Scarcity water level; 93: Over run water level; | | 18 | 86 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| Parameter Group 05: Digital In/Out | C05.30 | 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; 15: Out of frequency rang; | | 0 | 88 |
| | C05.31 | Terminal DO2 Digital Output | 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: Remote 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; | | 0 | 88 |

HOLIP®

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| Parameter Group 05: Digital In/Out | C05.40 | Relay Function (KA-KB,FA-FB FB-FC) | 36: Control word bit 11; 37: Control word bit12; 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; 90: Upto wobble limit; 91: Upto wobble ref.; 100: Start pump1; 101: Start pump2; 102: Below water level, low; 103: Above water level, high; 104: Low water warning; 105: High water warning; 106: Low voltage warning; 107: Over voltage warning; 108: sleep; | | 5,9 | 88 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group 05: Digital In/Out | C05.55 | Terminal DI4 Low Frequency | 0.020~49.999 | KHz | 0.020 | 91 |
| | C05.56 | Terminal DI4 High Frequency | 0.021~50.000 | KHz | 50.000 | 91 |
| | C05.57 | Terminal DI4 Low Ref./ Feedb. Value | -4999.000~4999.000 | | 0.000 | 91 |
| | C05.58 | Terminal DI4 High Ref./ Feedb.Value | -4999.000~4999.000 | | 50.000 | 92 |
| | C05.59 | Terminal DI4 Filter Time Constant | 1~1000 | ms | 100 | 92 |
| | C05.60 | Terminal DO1 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 | 92 |
| | C05.61 | Pulse Output Min Freq | 0.020~49.999 | KHz | 0.020 | 93 |
| | C05.62 | Pulse Output Max Freq | 0.021~50.000 | KHz | 50.000 | 93 |
| | C05.63 | Pulse Output Min Scale | 0.00~200.00 | % | 0.00 | 93 |
| | C05.64 | Pulse Output Max Scale | 0.00~200.00 | % | 100.00 | 93 |
| | *C05.70 | Encoder Per Revolution | 256~4096 | | 1024 | 94 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| | *C05.71 | Encoder Direction(PG card) | 0: Clockwise; 1: Counter clockwise; | | 0 | 94 |
| Parameter Group 06: Analog In/Out | C06.00 | Live Zero Timeout Time | 1~99 | s | 10 | 94 |
| | C06.01 | Live Zero Timeout Function | 0: Off; 1: Freeze output; 2: Stop; 3: Jogging; 4: Max. speed; 5: Stop and Trip; | | 0 | 94 |
| | C06.10 | Terminal VI Low Voltage | 0.00~9.99 | V | 0.07 | 95 |
| | C06.11 | Terminal VI High Voltage | 0.10~10.00 | V | 10.00 | 95 |
| | C06.12 | Terminal VI Low Current | 0.00~19.99 | mA | 0.14 | 95 |
| | C06.13 | Terminal VI High current | 0.01~20.00 | mA | 20.00 | 95 |
| | C06.14 | Terminal VI Low Ref./ Feedb.Value | -4999.000~4999.000 | | 0.000 | 95 |
| | C06.15 | Terminal VI High Ref./ Feedb.Value | -4999.000~4999.000 | | 50.000 | 96 |
| | C06.16 | Terminal VI Filter Time Constant | 0.01~10.00 | s | 0.01 | 96 |
| | C06.18 | Terminal VI Zero dead band | 0.00~20.00 | V/ mA | 0.00 | 96 |
| | C06.19 | Terminal VI Mode | 0: Votage mode; 1: Current mode; | | 0 | 97 |
| | C06.20 | Terminal AI Low Voltage | 0.00~9.99 | V | 0.07 | 97 |
| | C06.21 | Terminal AI High voltage | 0.01~10.00 | V | 10.00 | 97 |
| | C06.22 | Terminal AI Low Current | 0.00~19.99 | mA | 0.14 | 97 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| Parameter Group 06: Analog In/Out | C06.23 | Terminal AI High Current | 0.01~20.00 | mA | 20.00 | 98 |
| | C06.24 | Terminal AI Low Ref./ Feedb.Value | -4999.000~4999.000 | | 0.000 | 98 |
| | C06.25 | Terminal AI High Ref./ Feedb.Value | -4999.000~4999.000 | | 50.000 | 98 |
| | C06.26 | Terminal AI Filter Constant | 0.01~10.00 | s | 0.01 | 98 |
| | C06.28 | Terminal AI Zero dead band | 0.00~20.00 | V/ mA | 0.00 | 98 |
| | C06.29 | Terminal AI Mode | 0: Voltage mode; 1: Current mode; | | 1 | 99 |
| | C06.70 | Terminal VO Mode | 0: 0-20mA; 1: 4-20mA; 3: 0-10V; | | 3 | 99 |
| | 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 | 99 |
| | C06.73 | Terminal VO Output Min Scale | 0.00~200.00 | % | 0.00 | 100 |
| | C06.74 | Terminal VO Output Max Scale | 0.00~200.00 | % | 100.00 | 100 |
| | C06.81 | LCP Potmeter Low Ref. | -4999.000~4999.000 | | 0.000 | 100 |
| | C06.82 | LCP Potmeter High Ref. | -4999.000~4999.000 | | 50.000 | 101 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| | C06.90 | Terminal AO Mode | 0: 0~20mA;<br>1: 4~20mA; | | 0 | 101 |
| | C06.91 | Terminal AO Analog output | See also C06.71. | | 0 | 101 |
| | C06.93 | Terminal AO Output Min Scale | 0.00~200.00 | % | 0.00 | 101 |
| | C06.94 | Termianl AO Max Scale | 0.00~200.00 | % | 100.00 | 102 |
| Parameter Group07: Controllers | C07.02 | Speed PID Proportional Gain | 0.000~1.000 | | 0.015 | 102 |
| | C07.03 | Speed PID Integral Time | 2.0~20000.0 | ms | 8.0 | 102 |
| | C07.04 | Speed PID Differe-ntiation Time | 0.0~200.0 | ms | 30.0 | 102 |
| | C07.05 | Speed PID Diff Gain Time | 1.000~20.000 | | 5.000 | 103 |
| | C07.06 | Speed PID Lowpass Time | 1.0~100.0 | ms | 10.0 | 103 |
| | *C07.08 | Speed PID Feed Forward Factor | 0~500 | % | 0 | 103 |
| | C07.20 | Process CL Feedback Resource | 0: No Function;<br>1: Analog in VI;<br>2: Analog in AI;<br>8: Pulse input;<br>11: Local bus; | | 0 | 103 |
| | C07.30 | Process PI Normal/ Inverse Control | 0: Normal; 1: Inverse | | 0 | 103 |
| | C07.31 | Process PI Anti Windup | 0: Disabled;<br>1: Enabled; | | 1 | 104 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| Parameter Group07: Controllers | C07.32 | Process PI Start Speed | 0.0~200.0 | Hz | 0.0 | 104 |
| | C07.33 | Process PI Proportional Gain | 0.0~10.00 | | 0.01 | 105 |
| | C07.34 | Process PI Integral time | 0.10~9999.00 | s | 9999.00 | 105 |
| | C07.38 | Process PI Feed Forward Factor | 0~400 | % | 0 | 105 |
| | C07.39 | On Reference Bandwidth | 0~200 | % | 5 | 105 |
| | C07.41 | Process PI Output Low | -100-100 | % | 0 | 105 |
| | C07.42 | Process PI Output High | -100-100 | % | 100 | 106 |
| Parameter Group 08: FC Port Settings | C08.01 | Control Site | 0: Digital and ctrl. word; 1: Digital only; 2: Control Word only; | | 0 | 106 |
| | C08.02 | Control Word Source | 0: None; 1: FC RS485; | | 1 | 106 |
| | C08.03 | Control Word Timeout Time | 0.1~6500.0 | s | 1.0 | 106 |
| | C08.04 | Control Word Timeout Function | 0: Off; 1: Freeze output; 2: Stop; 3: Jogging; 4: Max. speed; 5: Stop and trip; | | 0 | 106 |
| | C08.06 | Reset Control Word Timeout | 0: No Function; 1: Do Reset; | | 0 | 107 |
| | C08.30 | Protocol | 0: FC; 2: MODBUS RTU; 6: MODBUS ASCII; | | 0 | 107 |
| | C08.31 | Address | FC (1~126); MODBUS RTU (1~247); | | 1 | 107 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| Parameter Group 08: FC Port Settings | C08.32 | 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 | 107 |
| | C08.33 | FC Port Parity | 0: Even Parity,1Stop bit; 1: Odd Parity,1stop bit; 2: No Parity,1Stop bit; 3: No Parity,2 Stop bits; | | 0 | 108 |
| | C08.35 | Minimum Response Delay | 0.001~0.500 | s | 0.010 | 108 |
| | C08.36 | Max. Response Delay | 0.010~10.000 | s | 5.000 | 108 |
| | C08.50 | Coasting Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 108 |
| | C08.51 | Quick Stop Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 108 |
| | C08.52 | DC Brake Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 109 |
| | C08.53 | Start Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 109 |
| | C08.54 | Reversing Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 109 |
| | C08.55 | Set-up Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 109 |
| | C08.56 | Preset Reference Select | 0: Digital input; 1: Bus; 2: Logic AND; 3: Logic OR; | | 3 | 110 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|---------------|---------------------|---------------|------|-----------------|----------|
| | C08.94 | Bus Feedback 1 | -32768~32767 | | 0 | 110 |
| Parameter Group 13 Simple PLC | C13.00 | Sample PLC Mode | 0: Off; 1: Order execution; 2: Parallel execution; | | 0 | 110 |
| | C13.01 | Start Event | 0~54 | | 39 | 111 |
| | C13.02 | Stop Event | 0~54 | | 40 | 112 |
| | C13.03 | Reset Sample PLC | 0: Do not reset; 1: Reset Sample PLC; | | 0 | 112 |
| | C13.10 | Comparator Operand | 0~31 | | 0 | 113 |
| | C13.11 | Comparator Operator | 0~2 | | 1 | 113 |
| | C13.12 | Comparator Value | -99990~99990 | | 0.0 | 114 |
| | C13.20 | SL Controller Timer | 0.0~3600 | s | 0.0 | 114 |
| | C13.40 | Logic Rule Boolean 1 | 0~64 | | 0.0 | 114 |
| | C13.41 | Logic Rule Operator 1 | 0~8 | | 0 | 114 |
| | C13.42 | Logic Rule Boolean 2 | Same to C13.40 | | 0 | 115 |
| | C13.43 | Logic Rule Operator 2 | 0~8 | | 0 | 115 |
| | C13.44 | Logic Rule Boolean 3 | Same to C13.40 | | 0 | 116 |
| | C13.51 | SL Controller Event | Same to C13.40 | | 0 | 116 |
| | C13.52 | SL Controller Action | 0~69 | | 0 | 116 |
| | C14.01 | Switching Frequency | 2~6: 2kHz~6kHz; 7: 8kHz; 8: 10 kHz; 9: 12kHz; 10: 16kHz; | | 4 | 118 |
| | *C14.03 | Over modulation | 0: Off; 1: On; | | 1 | 118 |
| | C14.08 | Damping Gain Factor | 0~200 | % | 96 | 118 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| Parameter Group 14 Special Functions | C14.12 | Function at Mains Imbalance | 0: Trip; 1: Warning; 2: Disabled; | | 0 | 119 |
| | 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 | 119 |
| | C14.21 | Automatic Restart Time | 0~600 | s | 10 | 119 |
| | C14.22 | Operation Mode | 0: Normal Operation; 2: Initialisation; | | 0 | 119 |
| | C14.27 | Action At Inverter Fault | 0: Trip; 1: Warning; | | 0 | 120 |
| | *C14.40 | VT Level | 40-90 | % | 90 | 120 |
| | *C14.41 | AEO Minimum Magnetisation | 40~75 | % | 66 | 120 |
| | *C14.51 | DC-Link Voltage Compensation | 0: Off; 1: On; | | 1 | 120 |
| | *C14.55 | Output Filter | 0: Off; 1: Sine-Wave Filter; 3: Sine-Wave Filter with feedback; | | 0 | 121 |
| | *C14.63 | Min Switch Frequency | 2~6: 2kHz~6kHz; 7: 8kHz; 8: 10 kHz; 9: 12kHz; 10: 16kHz; | | 2 | 121 |
| | C15.00 | Operating Days | 0~9999 | d | | 121 |
| | C15.01 | Running Hours | 0~60000 | h | | 121 |
| | C15.02 | KWh Counter | 0~65535 | | | 121 |
| | C15.03 | Power up's | 0~2147483647 | | | 122 |
| | C15.04 | Over Temp's | 0~65535 | | | 122 |
| | C15.05 | Over Volt's | 0~65535 | | | 122 |
| | C15.06 | Reset KWh Counter | 0: Do not reset; 1: Reset Counter; | | | 122 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group 15: Drive Information | C15.07 | Reset Running Hours Counter | 0: Do not reset; 1: Reset Counter; | | | 122 |
| | C15.30 | Fault Log: Error Code | 0~255 | | | 122 |
| | C15.31 | Internal Fault Reason | -32767~32767 | | | 123 |
| | C15.40 | FC Type | View FC type | | | 123 |
| | C15.41 | Power Section | View power size of the drive | | | 123 |
| | C15.42 | Voltage | View Mains Voltage of the drive | | | 123 |
| | C15.43 | Software Version | View the software version | | | 123 |
| | C15.44 | Ordered Type Code | View the ordered type code of the drive | | | 123 |
| | C15.46 | Frequency converter ordering NO. | View frequency converter ordering NO. | | | 123 |
| | C15.47 | Power Card Ordering NO. | View power card ordering No. of the drive | | | 124 |
| | C15.48 | LCP ID NO. | View LCP ID NO. | | | 124 |
| | C15.49 | Software ID Control Card | View software ID control card | | | 124 |
| | C15.50 | Software ID Power Card | View software ID Power card | | | 124 |
| | C15.51 | Frequency Converter Serial Number | View frequency converter No. | | | 124 |
| | C15.53 | Power Card Serial number | View power card serial number | | | 124 |
| | C15.92 | Parameter List | View parameter list of the drive | | | 124 |
| | C16.00 | Control Word | 0~65535 | | | 125 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| Parameter Group 16 Data Readouts | C16.01 | Reference [Unit] | -4999.000~4999.000 | | | 125 |
| | C16.02 | Reference % | -200.0~200.0 | % | | 126 |
| | C16.03 | Status Word | 0~65535 | | | 126 |
| | C16.04 | Active Set-up | 0~2 | | | 126 |
| | C16.05 | Motor Speed [RPM] | 0~9999 | Hz | | 127 |
| | C16.09 | Custom Readout | 0.00~9999.00 | | | 127 |
| | C16.10 | Power[KW] | 0.000~1000.000 | kW | | 127 |
| | C16.11 | Power[hp] | 0.000~1000.000 | Hp | | 127 |
| | C16.12 | Motor Voltage | 0.0~65535 | V | | 127 |
| | C16.13 | Frequency | 0.0~400.0 | Hz | | 127 |
| | C16.14 | Motor Current | 0.00~655.35 | A | | 127 |
| | C16.15 | Frequency (%) | 0.0~200.0 | % | | 128 |
| | C16.18 | Motor Thermal | 0~100 | % | | 128 |
| | C16.30 | DC Link Voltage | 0~65535 | V | | 128 |
| | C16.34 | Heat sink Temp. | 0~255 | | | 128 |
| | C16.35 | Inverter Thermal | 0~255 | % | | 128 |
| | C16.36 | Inv. Nom. Current | 0.00~655.35 | A | | 128 |
| | C16.37 | Inv. Max. Current | 0.00~655.35 | A | | 128 |
| | C16.38 | SLC Controller State | 0~255 | | | 128 |
| | C16.40 | Wobble Length | 0.000~60.000 | Km | | 129 |
| | C16.50 | External Reference | -200.0~200.0 | % | | 129 |
| | C16.51 | Pulse Reference | -200.0~200.0 | % | | 129 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group I6: Data Readouts | C16.52 | Feedback # [Unit] | -4999.000~4999.000 | | | 129 |
| | C16.60 | Digital Input | 0~65535 | | | 129 |
| | C16.61 | Terminal VI Setting | 0: 0-10V; 1: 0-20mA; | | | 130 |
| | C16.62 | Analog Input VI | 0.000-20.000 | V/mA | | 130 |
| | C16.63 | Terminal AI Setting | 0: 0-10V; 1: 0-20mA; | | | 130 |
| | C16.64 | Analog Input AI | 0.000~20.000 | V/mA | | 130 |
| | C16.65 | Analog Output AO | 0.000~20.000 | V/mA | | 130 |
| | C16.66 | Digital Output DO | 0~255 | | | 130 |
| | C16.67 | Encoder Input | -9999.000~9999.000 | KHz | | 131 |
| | C16.68 | Pulse Input DI4 | 0.020~50.000 | KHz | | 131 |
| | C16.69 | Pulse Output DO | 0.020~50.000 | KHz | | 131 |
| | C16.71 | Relay Output [bin] | 0~65535 | | | 131 |
| | C16.72 | Counter A | 0~2147483647 | | | 131 |
| | C16.73 | Counter B | 0~2147483647 | | | 131 |
| | C16.78 | Analog Output AO | 0.00~20.00 | mA | | 131 |
| | C16.86 | FC Port REF | -32768~32767 | | | 132 |
| | C16.90 | Alarm Word | 0~0xFFFFFFFFUL | | | 132 |
| | C16.91 | Alarm Word 2 | 0~0xFFFFFFFFUL | | | 133 |
| | C16.92 | Warning Word | 0~0x7FFFFFFFUL | | | 133 |
| | C16.93 | Warning Word 2 | 0~0x7FFFFFFFUL | | | 134 |
| | C25.00 | Cascade Mode | 0: Normal cascade; 1: Water level control; | | 0 | 134 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group 25 App. functions Cascade | C25.03 | Fixed Speed Pump Number | 0~2 | | 0 | 134 |
| | C25.10 | Multi Pressure Selection | 0: Disable; 1: Enable; | | 0 | 134 |
| | C25.11 | Present Time | 0.00~23.59 | h | 0.00 | 134 |
| | C25.12 | Multi Pressure Time | 0.00~23.59 | h | 0.00 | 135 |
| | C25.20 | Cascade Low Frequency | 0.000~400.000 | Hz | 20.000 | 135 |
| | C25.21 | Low Frequency Delay Time | 0.0~3600.0 | s | 20.0 | 135 |
| | C25.25 | Cascade High Frequency | 0.000~400.000 | Hz | 50.000 | 136 |
| | C25.26 | High Frequency Delay Time | 0.0~3600.0 | s | 20.0 | 136 |
| | C25.30 | Low Pressure Warning Level | 0.000~99.999 | kg | 3.000 | 136 |
| | C25.31 | Low Pressure Warning Delay Time | 0.0~3600.0 | s | 10.0 | 136 |
| | C25.32 | Recovery Low Pressure Level | 0.000~99.999 | kg | 4.000 | 136 |
| | C25.33 | Recovery Low Pressure Level Delay Time | 0.0~3600.0 | s | 10.0 | 137 |
| | C25.34 | Over Pressure Warning Level | 0.000~99.999 | kg | 7.000 | 137 |
| | C25.35 | Over Pressure Warning Level Delay Time | 0.0~3600.0 | s | 10.0 | 137 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| Parameter Group 25 App. functions Cascade | C25.36 | Recovery High Pressure Level | 0.000~99.999 | kg | 5.000 | 137 |
| | C25.37 | Recovery High Pressure Level Delay Time | 0.0~3600.0 | s | 10.0 | 137 |
| | C25.40 | Pump Interlock Time | 0.0~3600.0 | s | 5.0 | 138 |
| | C25.41 | Pump Continuous Run Time | 0.0~3600.0 | h | 12.0 | 138 |
| | C25.50 | Sleep Time | 0: Disable; 1: Enable; | | 1 | 138 |
| | C25.51 | Sleep Pressure Level | 0~150.0 | % | 95 | 138 |
| | C25.52 | Sleep Pressure Delay Time | 0.0~300.0 | s | 20.0 | 139 |
| | C25.53 | Sleep Frequency | 0.0~400.0 | Hz | 20.0 | 139 |
| | C25.54 | Sleep Frequency Delay Time | 0.0~300.0 | s | 20.0 | 139 |
| | C25.57 | Awake Level | 0.0~150.0 | % | 80 | 139 |
| | C25.60 | Pump Type Selection | 0: Feed pump; 1: Drain pump; | | 0 | 140 |
| | C25.61 | Water Level Signal Source | 0: Digital input; 1: Analog input VI; 2: Analog input AI; 8: Pulse input; | | 0 | 140 |
| | C25.62 | Scarcity Water Level | 0~100 | % | 0 | 141 |
| | C25.63 | Low Water Level | 0~100 | % | 0 | 141 |
| | C25.64 | High Water Level | 0~100 | % | 0 | 141 |
| | C25.65 | Overrun Water Level | 0~100 | % | 0 | 141 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|------|------|------|------|------|------|------|
| Parameter Group 25: App functions Cascade | C25.66 | Standby Pressure 1 | 0.000~99.999 | kg | 3.000 | 141 |
| | C25.67 | Standby Pressure 2 | 0.000~99.999 | kg | 7.000 | 141 |
| | C25.68 | Water Level Dead Band | 0~100 | % | 5 | 142 |
| | C25.69 | Water Level DI Delay Time | 0~3600.0 | s | 20.0 | 142 |
| | C25.80 | Alarm Handle Selection | 0: Stop all; 1: Lag pump 1 running; 2: Lag pump 2 running; 3: Lag pump 1 2 running; | | 0 | 142 |
| Parameter Group 30: Wobble Function | C30.00 | Wobble Start Mode | 0: Auto; 1: Manual; | | 0 | 143 |
| | C30.01 | Dwell Frequency | 0.000~200.000 | Hz | 0.000 | 144 |
| | C30.02 | Dwell Time | 0.0~3600.0 | s | 0.0 | 144 |
| | C30.10 | Centre Frequency Rate | 0.000~30.000 | Hz/s | 0.500 | 144 |
| | C30.11 | Centre Frequency Low Limit | 0.000~200.000 | Hz | 10.000 | 144 |
| | C30.12 | Centre Frequency Mode | 0: Fixed; 1: Auto Decrease; | | 0 | 144 |
| | C30.13 | Delta Frequency Mode | 0: Relative to Speed High; 1: Relative to Centre Frequency; | | 0 | 145 |
| | C30.14 | Delta Frequency Percentage | 0~100 | % | 0 | 145 |
| | C30.15 | Jump Frequency Percentage | 0~100 | % | 0 | 145 |
| | C30.16 | Wobble Up Time | 1.0~1000.0 | s | 10 | 145 |

| Item | Parameter No. | Function Description | Setting range | Unit | Default setting | Page No. |
|---|---|---|---|---|---|---|
| Parameter Group 30 Wobble Function | C30.17 | Wobble Jump Time | 1~50 | ms | 1 | 145 |
| | C30.18 | Wobble Down Time | 1.0~1000.0 | s | 10 | 145 |
| | C30.20 | Random Function Mode | 0: Disable; 1: Enable; | | 0 | 146 |
| | C30.21 | Max.Random Ratio | -20~20 | % | 10 | 146 |
| | C30.22 | Min Random Ratio | -20~20 | % | -10 | 146 |
| | C30.30 | Wobble Length Source | 0: Digital input; 7: Encoder input; 8: Pulse input; | | 0 | 146 |
| | C30.31 | Count Per Meter | 0.01~600.00 | | 1.00 | 146 |
| | C30.32 | Setting Length | 0.000~60.000 | Km | 10.000 | 147 |
| | C30.33 | Length Reach Mode | 0: No action; 1: Stop; | | 0 | 147 |
| | C30.38 | Wobble Restore Mode | 0: Operate at centre frequency; 1: Operate at preset frequency; | | 0 | 147 |
| | C30.39 | Wobble Stage Store | 0: No function; 1: To store in stop and power off condition; 2:To store in power off condition; 3: To store in stop condition; | | 0 | 147 |

**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 C01.23;
[1] 60Hz, Motor frequency default value is 60 Hz, see C01.23;

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: C01.23  C01.25  C01.39  C01.56  C01.30  C01.33  C01.35.

| C00.04 | Functon Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Operation 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-B series inverter contains 2 set-ups: set-up1
        and set-up 2, which can be switched via digital inputs or serial
        communication commands. 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, $C00.33 = 1 \times 2^3 + 1 \times 2^7 = 136$.

| Pulse output | Pulse Input | AI | VI | Counter | Counter | Feedback Value | Temperature | DC-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] Disabled: Hand-on key has no function;

[1] Enabled: 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] Disabled, OFF/RESET key has no function;

[1] Enabled, OFF/RESET key stop signal and reset of any fault;

[2] Enabled reset only, reset only (fault), stop (off) function is disabled;

Description of the choice: When OFF/RESET key is chosen, the frequency converter stops with a normal stop ramp; it can only be started by pressing either hand or auto key on the LCP.

| 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 (C0.11).

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 C07.0\*;

[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 C01.55 and C01.56 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 C14.41 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,see parameter group C30.*;

[2] Cascade control,see parameter group C25.*;

[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".

**C01.2\* 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 C01.3\*.

Attention: Data of Parameter group C01.2\* 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 C01.22-C01.25 and C01.30-C01.35.

| *C01.22 | 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.

| *C01.23 | 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 C01.25.

| *C01.24 | 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.

| *C01.25 | 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 C01.23, Nominal Motor Speed will be affected.

| *C01.29 | 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.

HOLIP®

**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 | Ω | * |

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 | Ω | * |

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 | Ω | * |

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.

| *C01.39 | 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**

| *C01.42 | 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 | 0.0~10.0 | Hz | 100 |

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.
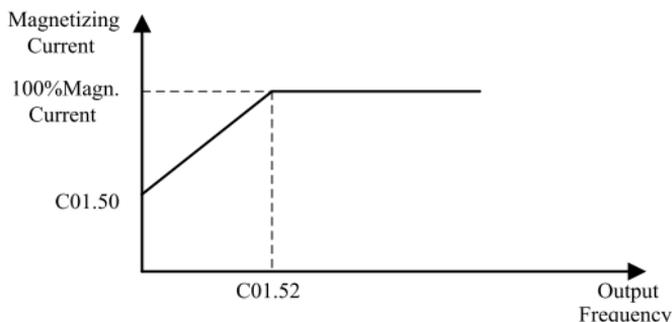


| C01.55 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | V/F Characteristic-V | 0~999.9 | V | 0/Vn |

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) .

| C01.56 | 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. C01.01 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. C01.56 the following applies F0=0 and F1≤F2≤F3≤F4≤F5.
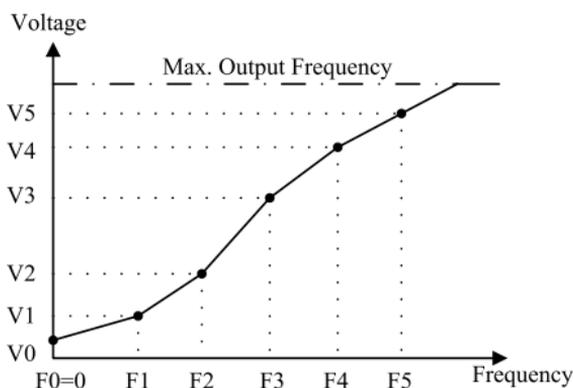


Fig. 6.1 V/F characteristic diagram

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.

**C01.6* 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.
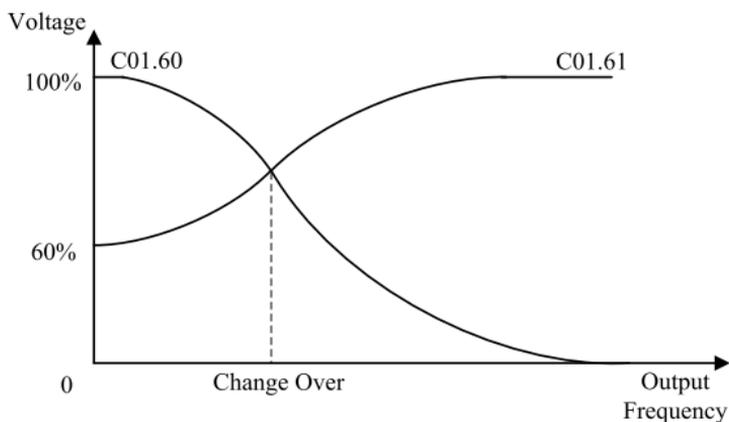


| C01.62 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Slip Compensation | -400~399 | % | 100 |

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 Constant | 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.

### C01.7* 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, C01.71 (Start delay) and C01.72 (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.



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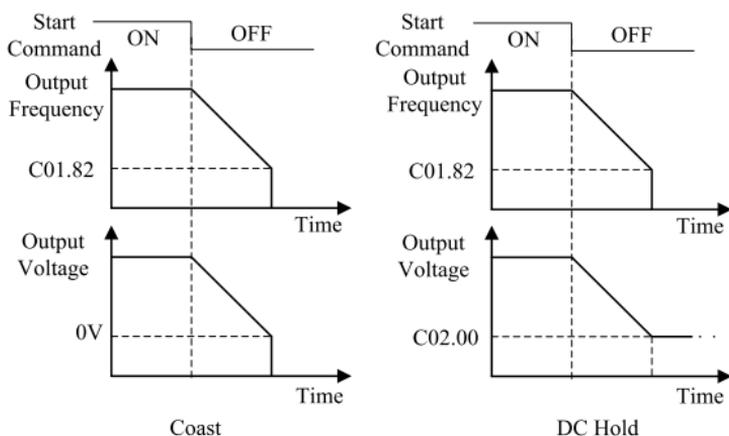
Description of Choice: This function is active in the following situations: Stop command is given and output speed is ramped down to Min. Speed for activating Functions at Stop; Start command is removed (standby), and output speed is ramped down to Min. Speed for activating Functions at Stop; DC-brake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

**C01.9* Motor Temperature**

| C01.90 | 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. C01.93, 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. C01.93, 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.

| *C01.93 | 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 | Termistor threshold |
|---|---|---|
| Digital | 10V | <0.8kΩ , >2.9kΩ |
| Analog | 10V | <0.8kΩ , >2.9kΩ |

## 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 C01.72 start function or C01.80 Function at Stop.

Description of Choice: Enter a value for holding current as a percentage of the rated motor current set in par. C01.24 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 C01.24.

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

DC-brake command, see C05.1* 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 actived, in connection with a stop command. When set to 0 the function is off.

**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 | Ω | * |

Function: Set brake resistor value.

| 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 C01.24.

| 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].
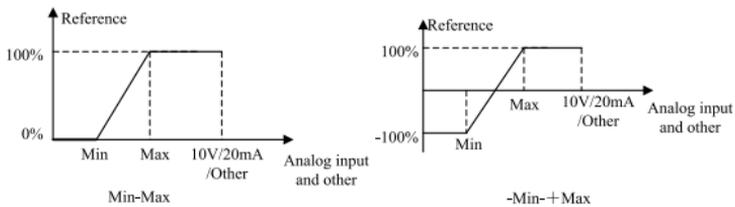


| C03.02 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Minmum Reference    | -4999.000~4999.000 |  | 0.000 |

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**

| | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| C03.10 | | | | |
| | 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 C03.03; When C03.00 select "0"(Min~Max), for example, If C03.02 is set to "20" and C03.03 is set to 50, 0　0 and 100　50; If C03.02 is set to "-70", and C03.03 is set to 50, 0　0 and 100　70.

Each parameter set-up contains 16 preset references which are selectable via digital terminals or local bus. See C05.1*.

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 |
|---|---|---|---|---|---|
| | 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 |
| Terminals State | 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 actived. Please refer to C05.1*, 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 C04.14.

| 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 C05.1*, 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:

Total reference= reference ±reference × (Catch up/Slowdown value)

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

For example: Set C05.12=28, C05.13=29, C03.12=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 is14Hz, 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/ C03.02 | Preset Relative Reference/ C03.14 | Relative Scaling Reference VI/C03.18=1 | Preset Reference/ C03.10 | Max Reference/ C03.03 | 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;

[2l] 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*;

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

[2l] 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;

[l] 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 with constant acceleration.

[2] S ramp: Motor ramp to the preset frequency with non-linear acceleration.

Description of Choice: If Linear [l] 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.



Ramp type and Ramp time
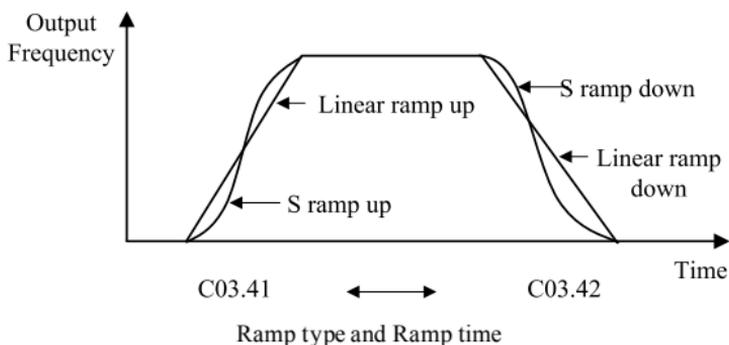
Attention: It is possible to switch acceleration and deceleration via digital input terminals, see parameterC05l* choice. The state of the digital input terminal is shown in binary code; If the drive detects the corresponding digital input terminals connected, then the bit is"1", on the contrary is"0". The corresponding relationship between state of the digital input terminalsbinary 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 |
|---|---|---|---|---|
| | Ramp1Ramp up Time | 0.05~3600.00 | S | * |

Function: Enter the ramp-up time from 0 Hz to rated Motor speed in C01.25.
Attention: Choose a rame-up time such that the output current does not exceed the current limit in C04.18.
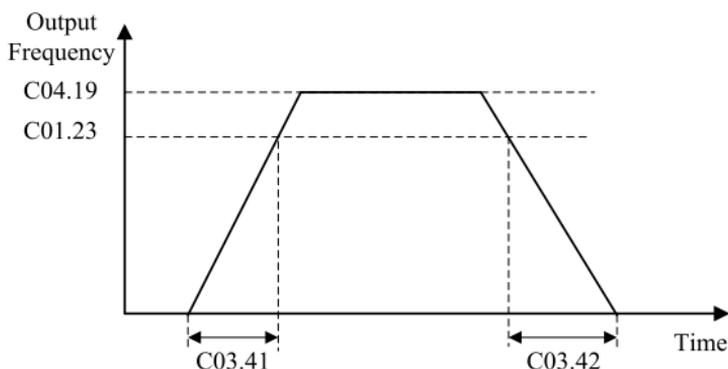
| C03.42 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Ramp1 Ramp Down Time | 0.05~3600.00 | S | * |

Function: Enter the deceleration time from the rated motor speed in C01.25 to 0Hz.

Attention: Choose a ramp-down time such that no over-voltage arises in the inverter due to regenerative operation of motor and such that the generated current does not exceed the current limit set in C04.18.

**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 with non-linear acceleration.

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

Function: Enter the ramp-up time from 0Hz to rated Motor speed in C01.25.

Attention: Choose a ramp-up time such that the output current does not exceed the current limit set in C04.18.

| 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 C01.25 to 0Hz.

Attention: Choose a ramp-down time such that no over-voltage arises in the inverter due to regenerative operation of motor and such that the generated current does not exceed the current limit set in C04.18.

**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 with non-linear acceleration.

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

Function: Enter the acceleration time from 0Hz to rated Motor speed in C01.25.

Attention: Choose a ramp-up time such that the output current does not exceed the current limit set in C04.18.

| 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 C01.25 to 0Hz.

Attention: Choose a ramp-down time such that no over-voltage arises in the inverter due to regenerative operation of motor and such that the generated current does not exceed the current limit set in C04.18.

**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 with non-linear acceleration.

| 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 C01.25.

Attention: Choose a ramp-up time such that the output current does not exceed the current limit set in C04.18.

| 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 C01.25 to 0Hz.

Attention: Choose a ramp-down time such that no over-voltage arises in the inverter due to regenerative operation of motor and such that the generated current does not exceed the current limit set in C04.18.

**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 (C01.25) or from the rated motor speed (C01.25) 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 C05.1, choose [14].

| 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 (C01.25) to 0Hz.

Description of Choice: Quick Stop Ramp Down Time is applicable when
Quick Stop Ramp Time is activated, see C051*, 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 limit for Motor Speed, the motor speed low
limit can be set to correspond to the minimum output frequency
of the motor shaft . The motor speed low limit must not exceed
the Motor Speed High Limit in C04.14.

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

Function: Enter the maximum limit for Motor Speed , the motor
speed high limit can be set to correspond to the maximum
manufacture's rated motor speed. The motor speed high limit
must exceed the Motor Speed Low Limit 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 C01.20 to C01.25 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;
    [l] Freeze output;
    [3] Jog;
    [4] Operating at the max.output frequency;
    [5] Stop and warning;
    [ll] Open loop running;

Function: Select which reaction the frequency converter should take if a feedback fault is detected.

Attention: When in HAND mode, and Speed-closed loop is selected, options [l] [3] [4] are invalid.

| C04.31 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Motor Feedback Speed Error | 1~600 | Rpm | 300 |

Function: Select the max allowed tracking error in speed from calculated and the actual mechanical motor shaft output speed.

| C04.32 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Motor Feedback Loss Timeout | 0.00~60.00 | S | 0.05 |

Function: Set the timeout value allowing the speed error set in C04.3l Motor Feedback Speed Error to be exceeded. If the motor feedback signal interrupts within this timeout value, the timer resets.

**C04.5* Adj. Warnings**

This parameter group is used to adjust warning limits for current speed reference and feedback . Warnings that are shown on the display can be programmed as an output or sent via serial bus.

| C04.50 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Warning Current Low | $0.00 \sim I_{max}$ | A | 0.00 |

Function: Enter the $I_{low}$ value, when the motor current falls below this limit, the
display reads current low. Setting range depends on the motor size.

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

| C04.51 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Warning Current High | $0.00 \sim I_{max}$ | A | |

Function: Enter the $I_{high}$ value, when the motor current exceeds this limit, the
display reads current high. Setting range and default setting depend
on the motor size.

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

| C04.52 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Warning Speed Low | $0.0 \sim 400.0$ | Hz | 0.0 |

Function: Enter the $n_{low}$ value, when the motor speed falls below this limit, the
display reads Speed Low.

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

| C04.53 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Warning Speed High | $0.1 \sim 400.0$ | Hz | 65.0 |

Function: Enter the $n_{high}$ value, when the motor speed exceeds this limit, the
display reads Speed High.

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

| C04.54 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Warning Reference Low | $-4999.000 \sim 4999.000$ | | 0.000 |

Function: Enter the lower reference limit, when the actual reference falls
below this limit, the display indicates Ref Low.

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

Function: Enter the upper reference limit, when the actual reference exceeds this limit, the display reads Ref High.

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

Function: Enter the lower feedback limit, when the feedback falls below this limit, the display reads Feedb Low.

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

Function: Enter the upper feedback limit, when the feedback exceeds this limit, the display reads Feedb High.

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

Option: [0] Off, functoin is disabled;
[l] On, function is enabled;

Attention: Missing motor phase causes motor torque to decrease. 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 make an active setting to avoid motor damage.

**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 used to set the bypass speed from of bypass speed range 1, [l] is used to set the bypass speed from of bypass speed range 2,and [2] is used to set that of bypass speed range3.

Description of Choice: Some systems call for avoiding some certain output speed due to resonance problems in system. The drive will pass quickly when it approaching to the Bypass Speed area.
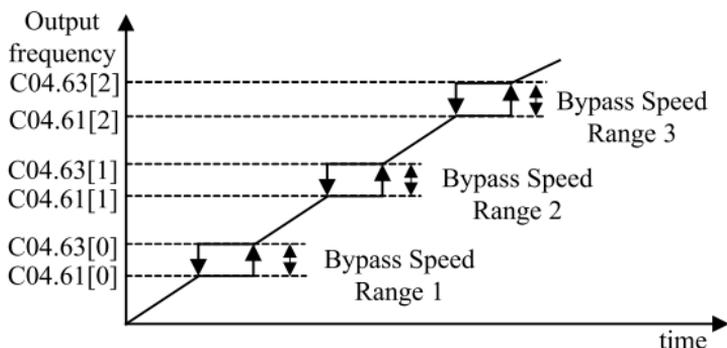


| C04.63 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Bypass Speed to     | 0.0~400.0 | Hz | 0.0 |

Array: [3];

Function: This parameter is a dyadic array, [0] is used to set the bypass speed to of bypass speed range 1, [1] is used to set the bypass speed to of bypass speed range 2,and [2] is set as that of bypass speed range3.

## 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, action on positive directional pulse;

[1] NPN, action on negative directional pulse;

Attention: PNP: Digital input terminals must be connected to +24V. NPN: Digital input terminals must be connected to GND.

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

Option: [0] PNP, action on positive directional pulse;
     [l] NPN, action on negative directional pulse;
Function: Select the desired digital output mode.

**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;
    [l] 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 C03.8l;

[5] DC-brake Inverse, see C02.0l, 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, l=start, 0=stop;

[9] Pulse start, motor starts if a pulse signal (pulse with of not less 4ms) is received.

[l0] Reversing, change direction of motor shaft rotation, reversing signal only changes direction of rotation, it does not activate start function, C04.l0 must choose [2] Both directions;

[ll] Start reversing, used for start/stop and for reversing at the same time;

[l2] Enable start forward only, the motor can only run clockwise direction;

[l3] Enable start reverse only, motor can only run counter clockwise direction;

[l4] Jog, used for activating jog speed, see C03.ll;

[l5] Preset ref. bit0, Preset ref.bit0 bitl bit2 bit3 is used for the choice of the preset reference, see parC03.l0;

[l6] Preset ref. bitl, same as[l5];

[l7] Preset ref. bit2, same as [l5];

[l8] Preset ref. bit3, same as [l5];

[l9] 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;

[2l] 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.l%. 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 [2l] ;

[23] Set-up select, see C00.l0 (Active Set-up) ;

[26] Precise stop inverse ,the function is available for C05.l5/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. C03.12;

[29] Slow down, select slow down to reduce the resulting reference value by the percentage set in par. C03.12;

[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 bit1 , 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";

[70] Wobble start command, see parameter group C30*;

[71] Wobble reset, see parameter group C30*;

[72] Wobble initialization, see parameter group C30*;

[90] Low water level, see parameter group C25*;

[91] High water level, see parameter group C25*;

[92] Scarcity water level, see parameter group C25*;

[93] Over run water level, see parameter group C25*;

## C05.3* Digital Output

| C05.30 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Terminal DO1 Digital Ouput | 0~108 | | 0 |

Attention: Because the DO1 also can be used as pulse output, so select [0] digital output in C05.60 to make this parameter 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]-[1] Array[0] indicates relay1, array[1] 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 and is 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 bitll, bitll in control word controls relay;

[37] Control word bitl2, bitl2 in control word controls relay;

[40] Exceeding reference range. Reference outside the setting range in C04.54 and C04.55 ;

[4l] 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;

[5l] 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 counter clockwise;

[56] Frequency converter  in HAND mode;

[57] Frequency converter  in AUTO mode;

[60] Comparator 0. Using a simple PLC, the results of comparator 0;

[6l] Comparator l, Using a simple PLC, the results of comparator l;

[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;

[7l] Logic Rule l, Using a simple PLC, the results of logic rule l;

[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 DOl/C05.30;

[8l] Sample PLC Digital Output. Only active for DO2/C05.3l;

[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 [l];

[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*;

[9l] Up to Wobble ref., see par. C30*;

[l00] Start Pump 1, see C25*;

[l0l] Start Pump 2, see C25*;

[l02] Below water level, low. See par. C25*;

[l03] Above water level, high. See par. C25*;

[l04] Low water warning. See par. C25*;

[l05] High water warning. See par. C25*;

[l06] Low voltage warning. See par. C25*;

[l07] Over-voltage warning. See par. C25*;
[l08] Sleep, see par. 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 low motor shaft speed in C05.57 Terminal DI4 Low Ref./feedback Value;
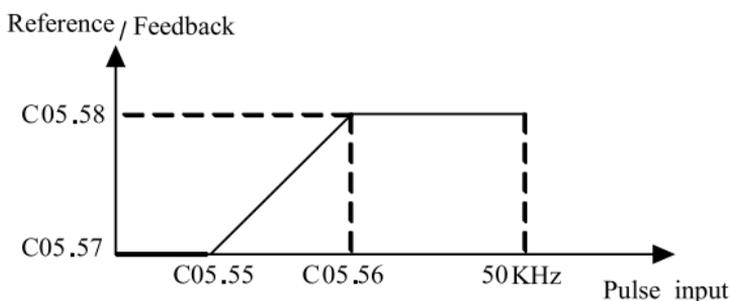


Description of Choice: Set C05.15 to 32 (pulse input), digital input terminals DI4 receives the pulse signal. Low frequency corresponds to reference/feedback in C05.57.

| 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 the high motor shaft speed in C05.58 Terminal DI4 High Ref./feedback Value.

| C05.57 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Terminal DI4 Low Ref./feedback | 4999.000~4999.000 | | 0.000 |

Function: Enter low frequency /feedback corresponding to value in 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 Time Constant | 1~1000 | ms | 100 |

Function: Enter the pulse filter time constant, the low pass filter reduces the influence on and dampends the oscillations on the feedback signal from the control. This parameter can't be changed when motor is running.

**C05.6* Pulse Output**

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

Option: [0] Digital Output, see C05.30;

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

[11] Reference, C03.00 select"0" [Min – Max] , 0% = 0.020KHz, 100% = 50.000KHz; C03.00 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. C16.37;

[16] Power, 0.020-50.000KHz corresponding to 0-Motor current, see C01.20;

[17] Speed, 0.020-50.000KHz corresponding to 0-Motor speed, see C01.25;

[18] Motor voltage, 0.020-50.000KHz corresponding to 0-Motor voltage, see C01.22;

[20] Bus control: 0.020-50.000KHz corresponding to 0.0% - 100.0%, 100% equals to settings in C03.03;

[21] Pulse input, 0.020-50.000KHz corresponding to reference in C05.55-C05.56 entered via DI4;

[22] Values on analog input VI, 0.020-50.000KHz corresponding to references in C06.10 C06.12 and C06.11 C06.13;

[23] Values on analog input AI, 0.020-50.000KHz corresponding to

reference in C06.20  C06.22 and C06.2l  C06.23;

Description of Choice: Parameters for configuring the scaling and output functions of pulse output. The pulse output corresponding to one reference between Min. frequency(C05.6l) to Max. frequency (C05.62). The scaling can be set in 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 mnimum possible frequency for pulse output.
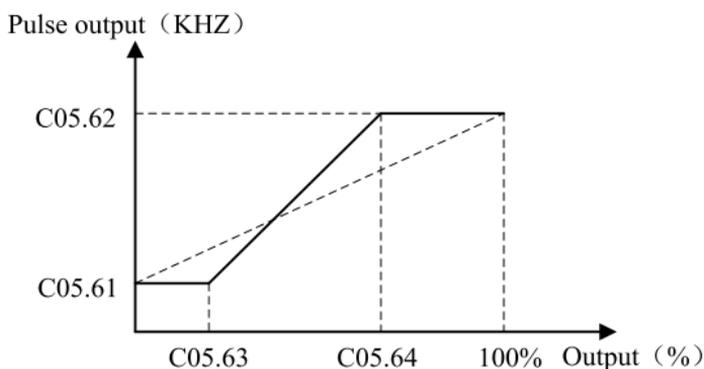


| C05.62 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Pulse Output Max. Freq. | 0.021~50.000 | KHz | 50.000 |

Function: Enter Max. frequency for 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 (pulses for each revolution of the motor shaft, 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×RPM/60 , the output frequency can be calculated.

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

Function: Select [0] clockwise, or select [l] counter clockwise. Change the detected encoder rotation without changing the wire to the encoder. This parameter can not be changed 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 |
|---|---|---|---|
| Live Zero Timeout Time | 1~99 | S | 10 |

Function: Enter the live Zero Time-out Time period, Live Zero Time-out Time is active for analog inputs. If the analog signal interrupts for the time period longer than the time set in this parameter, the function selected in C06.0lLive Zero Timeout Function will be activated.

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 |
|---|---|---|---|
| Live Zero Timeout Func. | 1~5 | | 0 |

Option: [0] Off;

[l] Freeze output, frozen at the present value;

[2] Stop, overruled to stop;

[3] Jogging, overruled to jog speed;

[4] Max. speed, overruled to Max.speed;

[5] Stop and trip, overruled to stop with subsequent trip.

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* Analoge 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.ll or C06.l3.



Analog input high greater than analog input low     Analog input high less than analog input low
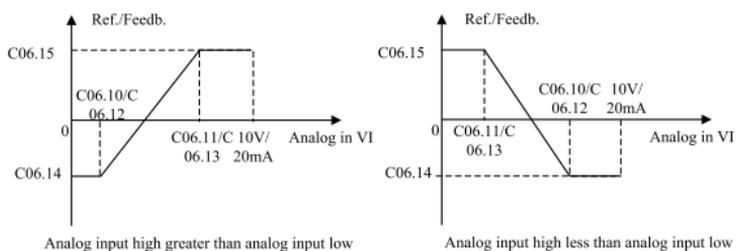
| C06.16 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Terminal Filter Time Constant | 0.01~10.00 | s | 0.01 |

Function: Enter the time constant, this is a first-order digital low pass filter time constant for suppressing electrical noise in analog input VI. A high time constant value improves dampening but also increases the time delay through the filter. This parameter can't be adjusted while the motor is running.

| 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.
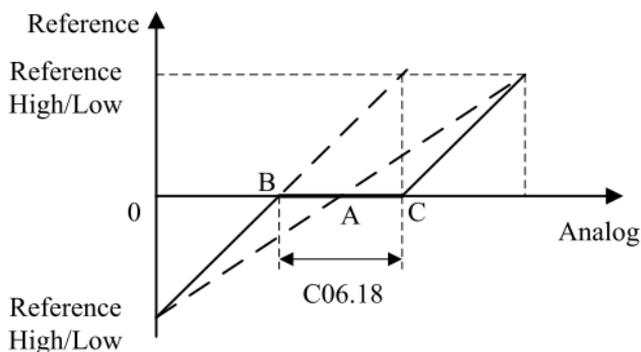
Description of Choice: Point A as shown in the figure is the analog value that corresponds to a setpoint that equals 0. It is calculated via analog low high values and low high references. UAB=UAC=C06.18/2

| 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. reference/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: Enter the time constant, this is a first-order digital low pass filter time constant for suppressing electrical noise in analog input AI. A high time constant value improves dampening but also increases the time delay through the filter. This parameter can't be adjusted while the motor is running.

| 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 Mode    | 0~1   |      | 0               |

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 DI4;

[22] Value on analog input VI, (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, (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 minmum output of selected ananlog signal at terminal VO as percentage of maximum signal value. See fig. below:
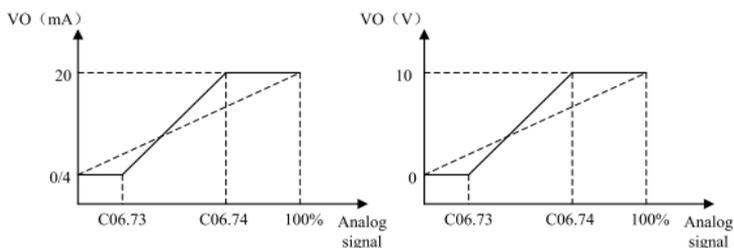


| C06.74 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Terminal VO Output Max Scale | 0.00~200.00 | % | 100.00 |

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 C06.71.
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 minmum output of selected analog signal at terminal AO as percentage of maximum signal value. See fig. below:
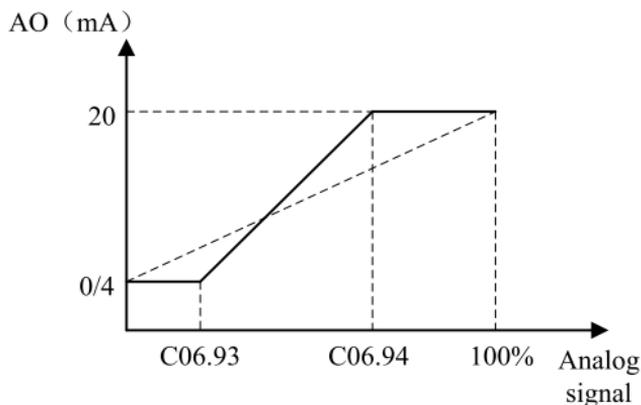
| C06.94 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Terminal AO Output Max. Scale | 0.00~200.00 | | 100.00 |

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 | 1.000~20.000 |  | 5.000 |

Function: It is possible to set a limit for the gain provided by differentiator. Since the D-gain increases at higher frequecies, limting 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;
　　　[l] Analog in VI(0-l0 V  0-20 mA  4-20 mA);
　　　[2] Analog in AI(0-l0 V  0-20 mA  4-20 mA);
　　　[8] Pulse input DI4 (0.020 – 50.000 KHz);
　　　[lI] 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;
　　　[l] 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: Enter the motor speed to be attained as a start signal for commencement of PID control . When the power is switched on, the frequency converter will commence ramping and then operate under speed open loop control. Thereafter, when the Process PI Start Speed is reached, the frequency converter will change over to Process PI Control.
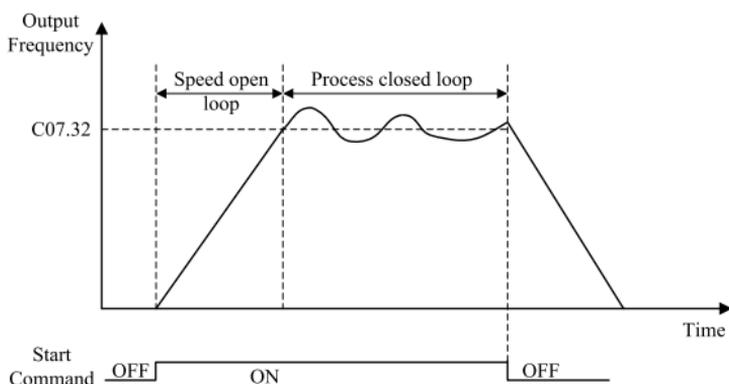
| C07.33 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Process PI Proportional Gain | 0.0~10.00 | | 0.01 |

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 Integral Time | 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 the setpoint and the 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 C04.19.

| 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 C04.19.

## 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;

[l] 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 l-l26, and MODBUS RTU range is l-247.

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

Option: [0] 2400;

[l] 4800;

[2] 9600;

[3] l9200;

[4] 38400;

[5]Reserved;

[6]Reserved;

[7]Reserved;

[8]Reserved;

[9]Reserved;

Function: Select baud rate for FC Port.

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

Option: [0] Even parity (1 stop bit);
    [l] Odd parity (l stop bit);
    [2] No parity (l stop bit);
    [3] No parity (2 stop bit);
Function: This parameter only effective for MODBUS RTU and FC bus
    always has even parity.

| C08.35 | Function Description | Range       | Unit | Default Setting |
|--------|---------------------|-------------|------|-----------------|
|        | 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.

| C08.36 | Function Description | Range        | Unit | Default Setting |
|--------|---------------------|--------------|------|-----------------|
|        | 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 C08.0l (control site) is set to (0)
digital and control word.

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

Option: [0] Digital input, Activate via a digital input;
    [l] 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.

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

Option: [0] Digital input, Aciviate via a digital input;
    [l] 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, Aciviate via a digital input;

[l] 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, Aciviate via a digital input;

[l] 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;

[l] 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, Aciviate via a digital input;

[l] 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, Aciviate via a digital input;

[l] 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 l00% feedback/range is +/-200%.

## 6.10 Parameter Group 13: Simple PLC

Simple PLC is a user-defined sequence of operation (Cl3.52[x]). When the associated user-defined envents (Cl3.5l[x]) is set to true, Sample 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 Cl3.00 order or parallel control, when start event (par.l3.0l) is "true", start simple PLC, when stop event (Cl3.02) is "true", Simple PLC will be stopped. In addition, you can also choose off [0] (Cl3.00) to stop the simple PLC.

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

**C13.0* Simple PLC Settings**

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

| C13.00 | 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 exceed 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 actived, this event is true;

[21] Alarm (trip lock), the drive alarms and trip lock is actived;

[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;

[3l] 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 DIl, input value entered via digital input DIl 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;

[5l] 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 Cl30l.
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;

[l] Reset Simple PLC, reset Simple PLC, references in parameter group Cl3 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, C13.10 [0] =4, C13.12 [0] =23, C13.11 [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 C13.10 is less than the set value in C13.12, the comparator output is true, or, false;

[1] Approx. Equal, if the variable selected in C13.10 equals the set value in parC13.12, 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 |

**C13.2* Timers**

Use the timer output to define an event (see C13.5l) or acts as Boolean inputs of the logic rules (see C13.40 C13.42 or C13.44).

| C13.20 | 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.

**C13.4* Logic Rules**

Combine up to three boolean inputs (TRUEor FALSE inputs) from timers comparators digital inputs status bits and events using the logical operators AND OR and NOT. C13.40 C13.42 and C13.44 are used to select logic rule Booleans, and C13.4l C13.43 is for selecting logic rule operators.

Caculation order: First, select three Boolean inputs from C13.40 C13.4l and C13.42 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 C13.43 and C13.44 to obtain the final result of the calculation ("TRUE or FALSE").

| C13.40 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Logic Rule Boolean 1 | 0~64 | | 0 |

Array: [4];

Option: Please refer to C13.0l;

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

| C13.41 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Logic Rule Operator 1 | 0~8 | | 0 |

Array: [4] ;

Option: [0] Disabled, ignoring C13.40 and C13.42 ;

[l] And, evaluates the expression [C13.40] AND [C13.42];

[2] Or, evaluates the expression [Cl3.40] OR [C13.42];

[3] And NOT, evaluates the expression [C13.40] AND NOT[C13.42];

[4] OR NOT, evaluates the expression [C13.40] OR NOT [C13.42];

[5] NOT AND, evaluates the expression NOT [C13.40] AND [C13.42];

[6] NOT OR, evaluates the expression NOT [C13.40] OR [C13.42];

[7] NOT AND NOT, evaluates the expressionNOT [C13.40] AND NOT [C13.42];

[8] NOT OR NOT, evaluates the expression NOT [C13.40] OR NOT [C13.42];

Function: Select the first logic operator to be used on the boolean inputs from C13.40 Logic Rule Boolean 1and C13.42 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 C13.01;

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 C13.44;

[1] AND, evaluates the expression [C13.40/C13.42] AND [C13.44];

[2] OR, evaluates the expression [C13.40/C13.42] OR [C13.44];

[3] AND NOT, evaluates the expression [C13.40/C13.42] AND NOT [C13.44];

[4] OR NOT, evaluates the expression [C13.40/C13.42] OR NOT [C13.44];

[5] NOT AND, evaluates the expression NOT [C13.40/C13.42] AND [C13.44];

[6] NOT OR, evaluates the expression NOT [C13.40/C13.42] OR [C13.44];

[7] NOT AND NOT, evaluates the expression NOT [C13.40/C13.42] AND NOT [C13.44];

[8] NOT OR NOT, evaluates the expression NOT [C13.40/C13.42] OR NOT [C13.44];

Function: Select the second logic operator to be used on the boolean input calculated in C13.40 Logic Rule Boolean 1 C13.42 Logic Rule Operator 1 and C13.43 Logic Rule Boolean 2 and the boolean input coming from C13.44 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 C13.0l;

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 evens 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 C13.0l;

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 |

Array: [30];

Option: [0] Disabled, function is disabled;

[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";

[10] Select preset ref 0;

[11] Select preset ref 1;

[12] Select preset ref 2;

[13] Select preset ref 3;

[14] Select preset ref 4;

[15] Select preset ref 5;

[16] Select preset ref 6;

[17] Select preset ref 7;

[18] Select ramp 1;

[19] 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] Dcstop, 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 l;

[3l] Start timer 2;

[32] Set digital out DOl 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 DOl high;

[39] Set digital out DO2 high;

[40] Set relay 1 high;

[4l] Set relay 2 high;

[42] Set digital out DO3 high;

[43] Set digital out DO4 high;

[50] Select preset ref 8;

[5l] Select preset ref 9;

[52] Select preset ref l0;

[53] Select preset ref ll;

[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";

[6l] 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 corresponding to the Simple PLC events (Cl3.5l). Actions are executed when the corresponding event is evaluated as true.

HOLIP

## 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 a significant 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 fault occurs.

| 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.

**C14.1* Mains On/Off**

| 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.

**C14.2* 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, can perform 1-10 automatic resets after trips;

[11] Auto reset11, can perform 15 automatic resets after trips;

[12] Auto reset12, can perform 20 automatic resets after trips;

[13] Infinite auto reset, can perform 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.

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

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

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

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

Description of choice: If [0] is selected, the inverter issues an warning and trips immediately if it detects an inverter fault; If [l] is selected, when an inverter fault occurs, the inverter issues an warning and stops the PWM outputs, and repeatlly try to open the normal PWM, if the fault still can't be removed, the inverter issues an 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 | % | 66 |

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;

[l] Enable;

Function: This function ensures the output voltage is independent of any voltage fluctuations in the DC link . Low torque ripple. In some cases, this dynamic compensation may cause resonance problems in DC link circuit and then this function should 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] 12 kHz;
    [10] 16 kHz;
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
    C15.07 Reset 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 C15.06.

| C15.03 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Power Up's | 0~2147483647 | | |

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.

| C15.05 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Over Voltages | 0~65535 | | |

Function: view the number of drive overvoltages that have occurred. This parameter can't be reset.

| C15.06 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Reset Kwh Counter | 0~1 | | |

Option: [0] Do not reset;
　　　　[l] Reset counter, Counter is reset;
Attention: This parameter can't be set via local bus.

| C15.07 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Reset Running Hours Counter | 0~1 | | |

Option: [0] Do not reset;
　　　　[l] Reset conuter Counter is reset;
Attention: This parameter can not be set via local bus.

**C15.3* Fault Log**

| C15.30 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
| | Fault Log:Error Code | 0~255 | | |

Function: View the error code, and look up its meaning in chapter 10. This parameter group contains a fault log showing reasons for the ten latest trips.

**HOLIP**®

| C15.31 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Internal Fault Reason | -32767~32767 | | |

Function: This parameter contains internal fault reasons, mostly used in combination with alarm 38.

**C15.4\* C15.5\*Drive Identification**

This parameter contains read only information about the hardware and software configuration of the frequency converter.

| C15.40 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | FC Type | 0~255 | | |

Description of Choice: View FC Type.

| C15.41 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Power Section | 0~255 | | |

Description of Choice: View the power size of the frequency converter.

| C15.42 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Voltage | 0~255 | | |

Description of Choice: View the voltage level corresponding to different type of drives.

| C15.43 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Software version | 0~255 | | |

Description of Choice: View the software version of the drive.

| C15.44 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Ordered Type Code | 0~255 | | |

Description of Choice: View the ordered type code of the drive.

| C15.46 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | FC ordering No. | 0~255 | | |

| C15.47 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Power Card Ordering No. |       |      |                 |

Description of Choice: View ordering number of the power card.

| C15.48 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | LCP IDNo.           |       |      |                 |

Description of Choice: View LCP ID number.

| C15.49 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Software ID Control Card |   |      |                 |

Description of Choice: View the control card ID number.

| C15.50 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Software ID Power Card |    |      |                 |

Description of Choice: View the power card ID number.

| C15.51 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | FC Serial Number    |       |      |                 |

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      | 0~255 |      |                 |

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 | d |               |

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 bitl | Preset Reference bitl |
| 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 | Undefined | Define |
| bit15 | No Function | Reversing |

| C16.01 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Reference | -4999.000~4999.000 | d |         |

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, the following shows the definition for each bit.

| Communication Status Word | | |
|------|-----------------------|-----------------------|
| bit | 0 | 1 |
| bit00 | Control not ready | Control Ready |
| bit0l | Drive not ready | Drive ready |
| bit02 | Coasting | Enabled |
| 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 |
| bitl0 | Frequency not in range | Frequency in range |
| bitll | Stop | Running |
| bitl2 | Brake resistor is normal | Brake resistor fault |
| bitl3 | Voltage limit | Out of voltage limit |
| bitl4 | Undefined | Undefined |
| bitl5 | No terminal warning | Terminal warning |

| C16.04 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | 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.

| C16.05 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|  | Motor Speed [RPM] | 0~9999 | Hz |  |

Function: View motor speed.

| C16.09 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|  | 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=C01.25/C01.20.

**C16.1* Motor Status**

| C16.10 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|  | Power(kW) | 0.000~1000.000 | kW |  |

Function: View output power in KW.

| C16.11 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|  | Power(Hp) | 0.000~1000.00 | Hp |  |

Function: View output power in HP, 1HP=0.75KW.

| C16.12 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|  | Motor Voltage | 0~65535 | V |  |

Function: View motor phase voltage.

| C16.13 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|  | 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 | | |

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.

| C16.38 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Simple PLC State | 0~255 | | |

Function: View the state of the event under execution by the SL Controller.

**C16.4\* Application Message**

| C16.40 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Wobble Length | 0.000~60.000 | Km | |

**C16.5\* Ref./Feedb.**

| C16.50 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | External Reference | -200.0~200.0 | % | |

Function: View sum of all external references in percent.

| C16.51 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Pulse Reference | -200.0~200.0 | % | |

Function: View actual pulse input converted to a reference in percent.

| C16.52 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Feedback | -4999.000~4999.000 | | |

Function: View analog or pulse feedback in HZ.

**C16.6\*  C16.7\* Inputs and Outputs**

| C16.60 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | 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-l0V;
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-l0V;
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 | V/mA | |

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 | DOl |

| 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 output status of the relay, the corresponding bit is set to "1"when the relay output is active, otherwise it will be set to "0".

| 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 | 0.00~20.00 | 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 from the FC port.

**C16.9* Diagnosis Readouts**

| C16.90 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Alarm Word          | 0~0xFFFFFFFFUL |  |  |

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:

| Binary | Alarm Word / C16.90 | Alarm Word 2/ C16.91 | Warning Word/C16.92 | Warning Word 2/C16.93 |
|--------|---------------------|----------------------|---------------------|------------------------|
| 0 | Brake detect | 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 |

| Binary | Alarm Word / C16.90 | Alarm Word 2/ C16.91 | Warning Word/C16.92 | Warning Word 2/C16.93 |
|--------|---------------------|----------------------|---------------------|------------------------|
| 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 | 0~0xFFFFFFFF | F | |

Function: View the Alarm Word sent via serial communication port in hex code.

| C16.92 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Warning Word 1 | 0~0x7FFFFFFF | F | |

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 25: App. Functions Cascade

**C25.0\* Cascade Control Mode**

| C25.00 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Cascade Mode | 0~1 | | 0 |

Option: [0] Normal Cascade, Applicable for general cascade;
  [l] Water Level Control, Standby pressure will be carried out to use when pool level exceeds the upper or lower water level limit.

| C25.03 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Fixed speed Pump Number | 0~2 | | 0 |

Function: In cascade controller, one inverter can control multiple pumps. Through the output switch signal, the auxiliary pump are assigned to start and stop.

**C25.1\* Pressure Setting**

| C25.10 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Multi Pressure Selection | 0~1 | | 0 |

Option: [0]Disable;
  [l] Multi pressure;
Function: In cascade, the pressure reference can be differently at different time to meet various application requirments. If this parameter is set to "0", the target pressure is the pressure setting for T0 period.

| C25.11 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Preset Time | 0.00~23.59 | h | 0.00 |

Option: Choose different pressure reference at different times in cascade control systems, the active time need to be set.
Attention: If the FC powers off, this parameter needs setting again.

| C25.12 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Multi Pressure Time | 0.00~23.59 | h | 0.00 |

Function: This is an array parameter, and it can set up to 6 time-integral.

T0　　　Set range: 0.00 – 23.59　Default setting: 0.00

T1- T5　Set range: 0.00 – 23.59　Default setting: 23.59

Up to 6 set points corresponding to the 6 time-integral can be set as follows:

| Time | Set Point |
|------|-----------|
| T0-T1 | C03.10[1] |
| T1-T2 | C03.10[2] |
| T2-T3 | C03.10[3] |
| T3-T4 | C03.10[4] |
| T4-T5 | C03.10[5] |
| T5-T0 | C03.10[6] |

Attention: 1  This rule must be followed: $T0 \leq T1 \leq T2 \leq T3 \leq T4 \leq T5$.

2  If $Tx = T(x+1)$ (x = 1, 2, 3, 4, 5), $T(x+1)$ is invalid.

3  If multi-pressure selection(C25.10) is disabled, use the pressure setting set in  C03.10[1] , where the current using pressure can be displayed.

**C25.2\* Cascade Frequency**

| C25.20 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Cascade Low Frequency | 0.000~400.000 | Hz | 20.000 |

Function: In cascade control systems, due to less consumption, the inverter output frequency is low, when output frequency is below the "cascade low frequency" and it lasts more than "low frequency delay time", the corresponding multi-function terminals (relay) acts, auxiliary pump is stopped.

| C25.21 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Low Frequency Delay Time | 0.0~3600.0 | s | 20.0 |

Function: This parameter used together with "Cascade Low Frequency".

| C25.25 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Cascade High Frequency | 0.000~400.000 | Hz | 50.000 |

Function: In cascade controller systems, due to larger amount of water consumption, the inverter output frequency is high, when the output frequency is higher than "High Speed Frequency", and it lasts more than "High Speed Delay Time", the corresponding multi junction moves, and auxiliary pump running.

| C25.26 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | High Freqency Delay Time | 0.0~3600.0 | s | 20.0 |

Function: This parameter works together with "Cascade High Frequency".

**C25.3* Over/Low Pressure Setting**

| C25.30 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Low Pressure Warning Level | 0.000~99.999 | kg | 3.000 |

Function: This parameter used to define the low pressure warning level, when the actual pressure is less than "Low Pressure Warning Level" and continues more than "Low Pressure Warning Delay Time", low pressure occurs, multi-function terminals related acts.

| C25.31 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Low Pressure Warning Delay Time | 0.0~3600.0 | s | 10.0 |

Function: This parameter used in conjunction with "Low Pressure Warning Level".

| C25.32 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Recovery Low Pressure Level | 0.000~99.999 | kg | 4.000 |

Function: when the actual pressure rise above "Recovery Low Pressure Level" and continue more than "Recovery Low Pressure Delay Time", Low Pressure Warning is cancelled.

| C25.33 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Recovery Low Pressure | 0.0~3600.0 | S | 10.0 |

Function: This parameter used together with "Recovery Low Pressure Level" (C25.32).

| C25.34 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Over Pressure Warning Level | 0.000~99.999 | kg | 7.000 |

Function: This parameter used to define over-pressure warning level, when the actual pressure is less than "Over-pressure Warning Level", and lasts more than "Over Pressure Warning Delay Time", then, an Over Pressure Warning occurs, multi-function conjunction acts, the drive stops.

| C25.35 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Over Pressure Warning Delay Time | 0.0~3600.0 | s | 10.0 |

Function: This parameter should be used together with "Over Pressure Warning Level".

| C25.36 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Recovery High Pressure Level | 0.000~99.999 | kg | 5.000 |

Function: When actual pressure rise above" Recovery High Pressure Level", and it lasts longer than "Recovery High Pressure Delay Time", then, over pressure warning is cancelled, the inverter starts to run.

| C25.37 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Recovery High Pressure Delay Time | 0.0~3600.0 | s | 10.0 |

Function: This parameter used in conjunction with "Recovery High Pressure Level".

**C25.4\* Pump InterLock**

| C25.40 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
|  | Pump Interlock Time | 0.0~3600.0 | s | 5.0 |

Function: Set the interlock time of the two auxiliary pumps when they switch to each other.
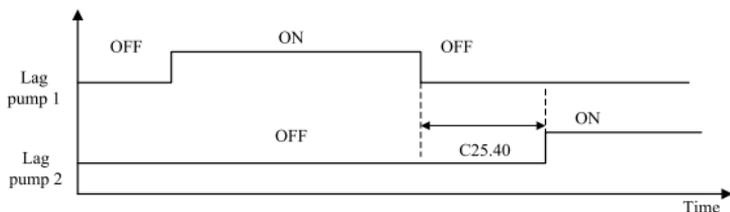


| C25.41 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
|  | Pump Continous Run Time | 0.0~3600.0 | h | 12.0 |

Function: When only one of the two auxiliary pump running, in order to balance the two auxiliary pump run time, when one of the two lag pumps continues run time reach to the" Pump Continous Run Time", the drive will switch to the other lag pump .

**C25.5\* Sleep Mode**

| C25.50 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
|  | Sleep Mode | 0~1 |  | 1 |

Option: [0] Disable;
　　　 [1] Enable;
Function: If [0] is selected, the inverter can't enter sleep mode.

| C25.51 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
|  | Sleep Pressure Level | 0~150.0 | % | 95.0 |

Function: Define the sleep pressure level of the main pump. Sleep Pressure = Target Pressure*Sleep Pressure Level.

| C25.52 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Sleep Pressure Delay | 0.0~300.0 | s | 20.0 |

Function: Define the sleep pressure duration before the main pump enter sleep mode.

| C25.53 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Sleep Frequency | 0.000~400.000 | Hz | 20.000 |

Function: Define the low frequency before the main pump go to sleep mode.

| C25.54 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Sleep Frequency Delay Time | 0.0~300.0 | s | 20.0 |

Function: Set the sleep frequency duration before the main pump go to sleep mode.

| C25.57 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Awake Level | 0.0~150.0 | % | 80.0 |

Function: Set the pressure level from sleep mode to awake mode. Awake pressure=Set point*Sleep mode awake level.
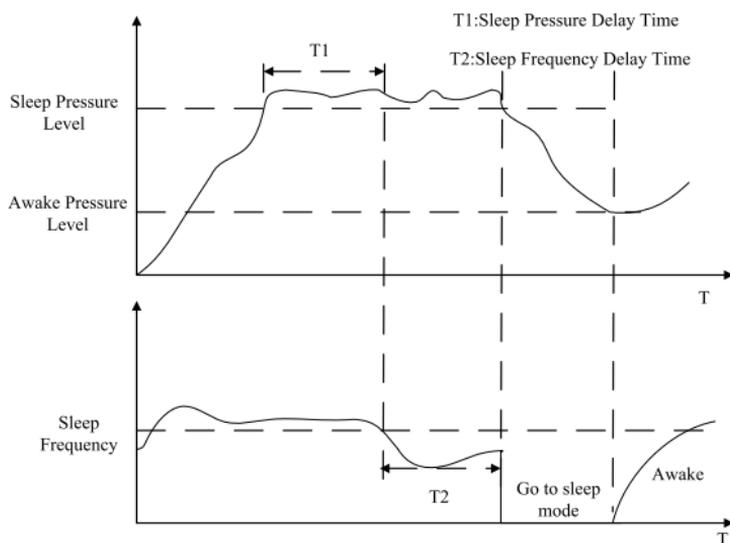
**C25.6\* Water Level Control**

| C25.60 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Pump Type Selection | 0~1   |      | 0               |

Option: [0] Feed pump;

[l] Draining pump;

Function: There are two kinds of water level control, one is used for feed pump, and the other is used for draining pump. the set point equals to normal set point setting when the water level between "low water level" and "high water level"; the set point equals to "standby pressure 2" when the water level between "scarcity water level" and "low water level"; the set point equals to "standby pressure l" when the water level between "high water level" and "overrun water level"; the "overrun water level warning" happens when the water level above the "overrun water level", and the lead pump will be stopped and all lag pumps will be destaged. The "overrun water level warning" will be recovered when the water level below the "low water level" and the cascade controller will be restated.

When draining pump is used, the set point equals to normal set point setting when the water level between "low water level" and "high water level"; the set point equals to "standby pressure l" when the water level between "scarcity water level" and "low water level"; the set point equals to "standby pressure 2" when the water level between "high water level" and "overrun water level"; the" scarcity water level warning" happens when the water level below the "scarcity water level", and the lead pump will be stopped and all lag pumps will be destaged. The "scarcity water level warning" will be recovered when the water level above the "high water level" and the cascade controller will be restated

| C25.61 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Water Level Signal Source | 0~8 |    | 0               |

Option: [0] Digital input;

[l] VI;

[2] AI;

[8] Pulse input;

Function: Define the source of the water level signal.

| C25.62 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Scarcity Water Level | 0~100 | % | 0 |

Function: Set the scarcity water level, the setting rang is from 0 to low water level. 100% corresponding to the pool water level at10V voltage.

| C25.63 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Low Water Level | 0~100 | % | 0 |

Function: Set the low water level, the setting rang is from the scarcity water level to low water level. 100% corresponding to the water level at 10V voltage.

| C25.64 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | High Warter Level | 0~100 | % | 0 |

Function: Set the high water level, the setting rang is from low water level to high water level. 100% corresponding to the water level at 10V voltage.

| C25.65 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Overrun Water Level | 0~100 | % | 0 |

Function: Set the overrun water level, the setting rang is from 0 to 100%, 100% corresponding to the water level at 10V voltage.

| C25.66 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Standby Pressure 1 | 0.000~99.999 | kg | 3.000 |

Function: To prevent the outlet pipe speed faster than the inlet pipe, leaving the water level rose too quickly into the pool, and even form over-voltage condition, so the pressure 1 is an alternative requirement to run.

| C25.67 | Function Description | Range | Unit | Default Setting |
|--------|--------------------|-------|------|-----------------|
|        | Standby Pressure 2 | 0.000~99.999 | kg | 7.000 |

Function: To prevent the velocity of the inlet pipe is less than the outlet pipe, leaving the pool water level decreases too fast, and even form under-voltage condition, pressure 2 is an reserved requirement to run.

| C25.68 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Water Level Dead Band | 0~100 | % | 5 |

Function: When the "water level signal source" selects "Analog input" or "Pulse Input", this parameter is used to prevent set point switch between normal set point and standby pressure too frequently. The deadband must be exit in "low water level" and "high water level". When water level rises, the actual water level higher than water level(upper level, lower level etc.) plus the water level deadband, switch the running pressure; when the water level falls, the actual water level drops below the set level(upper level, lower level etc.) minus the water level deadband, switch the operating pressure.



Water level from low to high    Water level from high to low

Water level deadband    Water level deadband

Real change point    Real change point
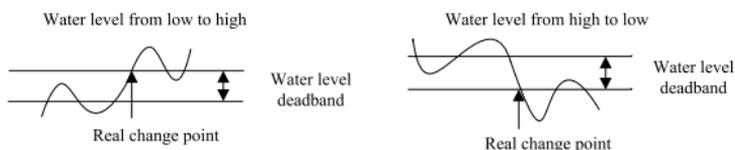
| C25.69 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Water Level DI Delay Time | 0~3600.0 | s | 20.0 |

Function: When "water level signal source" selects "Digital input", this parameter is used to prevent set point switch between normal set point and standby pressure too frequently . The set point switches when switch signal lasts water level DI delay time.

**C25.8* Fault Handle**

| C25.80 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Alarm Handl Selection | 0~3 |  | 0 |

Option: [0] Stop all;
[1] Lag pump 1 Running;
[2] Lag pump 2 Running;
[3] Lag pump 1  2 Running;
Function: Set action of the auxiliary pump when drive fault occurs.

## 6.15 Parameter Group 30: App. Functions Wobble

Wobble function is generally divided into wobble cycle with fixed center frequency  wobble cycle with auto decreased center frequency and wobble random three ways.  In any mode, we can set the delta  jump frequency  jump time  wobble start mode  wobble time  wobble stage store mode  dwell frequency and dwell time. In addition, there are two setting modes for delta, one is relative to center frequency, because center frequency can be set to Auto decrease, in this case, the delta is automatically reduced. The other is relative to motor speed high limit.



| | |
|---|---|
| Fdelta:  delta frequency | Fjump:  Jump frequency | Tdown:  wobble down time |
| Fdwell:  dwell frequency | Tjump:  wobble jump time | Tup:  wobble up time |
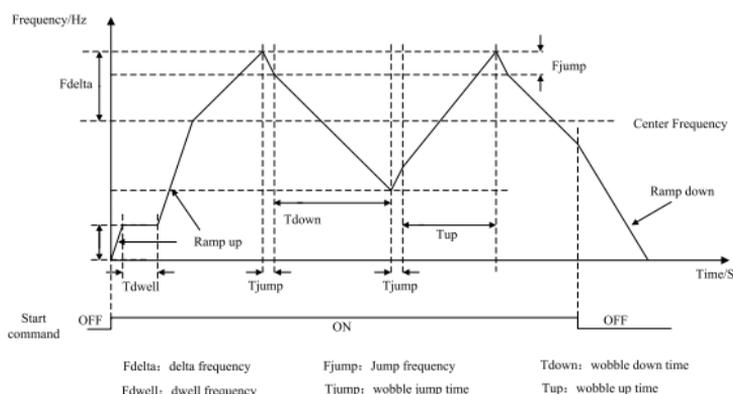
### C30.0*  Wobble Mode

Before wobble cycle starts, drive will ramp to center frequency(see C30.12) according to active ramp time if start command issued. During ramping, if dwell frequency (refer to C30.0l)reached, ramp up stage will be interrupted and dirve will go to dwell stage. After dwell stage ended, drive will go back to ramp stage and continue to ramp to center frequency. After center frequency reached, drive will go to wobble cycle stage.

| C30.00 | Function Description | Range | Unit | Default Setting |
|---|---|---|---|---|
| | Wobble Start Mode | 0~1 | | 0 |

Option: [0]Auto;

[I} Manul;

Function: If [0] is selected, dirve must stay at dwell stage for a period of dwell time if no wobble cycle start command, but if wobble cycle start command occurs (lantched input type can be accepted also), dwell stage will end; If[l] is selected, dwell stage will end when wobble cycle start command issued, and if wobble cycle start command

®
HOLIP

disappeared, drive will ramp to dwell stage and wait for wobble cycle start command to end dwell stage. In auto mode, there are running on center frequency and running on dwell frequency two ways to select for wobble reset. But in manul mode, only running on center frequency can be achieved .

| C30.01 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|----------------|
| | Dwell Frequency | 0.000-200.000 | Hz | 0.000 |

Function: During dwell stage, the drive will run on this frequency, until when wobble cycle start command issued or dwell time has been used up.

| C30.02 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|----------------|
| | Dwell Time | 0.0~3600.0 | s | 0.0 |

Function: When wobble start mode selecte Auto[0](C30.00=0), the drive runs on dwell frequency(C30.0l=0) in the period of the time set in this parameter.

**C30.1* Wobble Cycle**

| C30.10 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|----------------|
| | Centre Frequency Rate | 0.000~30.000 | Hz | 0.500 |

Function: When Center Frequency Mode select Auto Dcrease[l](C30.l2=l), this parameter used to set the dcrease rate for center frequency. And the center frequency can be defined via analog input preset reference or local bus.

| C30.11 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|----------------|
| | Centre Frequency Low Limit | 0.000~200.000 | Hz | 10.000 |

Function: When Center Frequency Mode select Auto Dcrease[l](C30.l2=l), this parameter used to set the low limit of the center frequency.

| C30.12 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|----------------|
| | Centre Frequency Mode | 0~1 | | 0 |

Option: [0]: Fixed, center frequency is unchangable ;
    [l]: Auto Decrease, center frequency of auto decrement.
Function: If [l] is selected, center frequency will decrease by the "Center

Frequency Decreasing Rate"(C30.10) till "Center Frequency Low Limit reached.When decreasing, there is no transition process, the drive runs directly under the new frequency.

| C30.13 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Delta Frequency Mode | 0~1  |      | 0               |

Option: [0] Relative to speed high;

[1] Relative to center frequency; delta can change with the center frequency. The relative percentage will be set in C30.14.

Function: If [0] is selected, $f_{delta}$ =Delta Frequency Percentage*Motor Speed High Limit/100; If [1] is selected, $f_{delta}$ =Delta Frequency Percentage*Center Frequency/100.

| C30.14 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Delta Frequency Percentage | 0~100 | % | 0 |

Function: Enter the value of the Delta Frequency Percentage.

| C30.15 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Jump Frequency Percentage | 0~100 | % | 0 |

Function: Enter value of the Jump Frequency Percentage. The jump frequency f jump =fdelta*Jump Frequency Percentage

| C30.16 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Wobble Up Time | 1.0~1000.0 | s | 10.0 |

Function: During the wobble cycle, this parameter used to set the time within which the drive ramp up to the wobble up (fcenter + fdelta) .

| C30.17 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Wobble Jump Time | 1~50 | ms | 1 |

Function: Set the jump time within which the drive ramp down by Jump Frequency .

| C30.18 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Wobble Down Time | 1.0~1000.0 | s | 10.0 |

Function: During the wobble cycle, this parameter used to set the time within which the drive ramp down to wobble down reference (fcenter - fdelta).

**C30.2* Wobble Random**

| C30.20 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Random Function Mode | 0~1 |      | 0               |

Option: [0] : Disable;

[1] : Enable;

Function: If [0] is selected, wobble up time and wobble down time are not randomized.

If [1] is selected, the actual wobble up time(Tup) and wobble down time(Tdown)will be fluctuated by a random value in the way below:

$$tup = tup + frandom * min(tup, tdown) / 100.$$
$$tdown = tdown - frandom * min(tup, tdown) / 100.$$

Frandom is a random value between maximum randomized wobble ratio and minimum randomized wobble ratio.

| C30.21 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Max. Radom Ratio | -20~20 | % | 10 |

Function: This parameter determines the maxmum wobble ratio which the random function is allowed to choose.

| C30.22 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Min. Radom Ratio | -20~20 | % | -10 |

Function: This parameter determines the minimum wobble ratio which the random function is allowed to choose .

**C30.3* Wobble Process Control**

| C30.30 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Wobble Length Source | 0~8 |      | 0 |

Option: [0]: Digital input, counter A is used as count source;

[7]: Encoder input, encoder input is used as count source;

[8]: Pulse input, pulse input is used as count source;

Function: This parameter is used to select wobble length source.

| C30.31 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
|        | Count Per Meter | 0.01~600.00 |      | 1.00 |

Function: Wobble Length= (Digital input  Encoder input or Pulse input)*Count per meter.

| C30.32 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Length Setting | 0.000~60.000 | km | 10.000 |

Function: When wobble length reaches to the value set in this parameter, Setting Length Reached Action becomes active.

| C30.33 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Length Reach Mode | 0~1 | | 0 |

Option: [0] : No action;

[I] Stop, the drive stops.

Function: If setting length reached, one of the selection in this parameter will be operated.

| C30.38 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Wobble Restore Mode | 0~1 | | 0 |

Option: [0] Dcenter stage;

[I] Dwell stage;

Function: When Auto is selected as Wobble cycle start mode (C30.00=0), if [0] is selected, drive will ramp to centre frequency according to active ramp time if wobble restore command is active; If [I] is selected, drive will ramp to dwell frequency according to active ramp time if wobble restore command is active; When Manuel is selected as Wobble cycle start mode(C30.00=l), if wobble restore command is active, drive will ramp to centre frequency according to active ramp time.

| C30.39 | Function Description | Range | Unit | Default Setting |
|--------|---------------------|-------|------|-----------------|
| | Wobble Stage Store | 0~3 | | 0 |

Option: [0] Disable;

[I] Power stop save;

[2] Power saves;

[3] Stop saves;

Function: This parameter is used to select in which way the wobble function saves the information.

# Chapter 7 Quick Application Guide

## 7.1 Motor Parameter Adaption
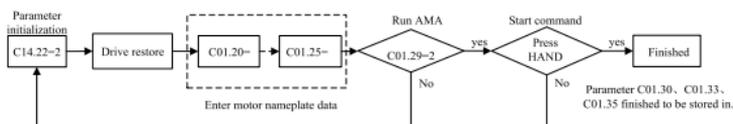


1. Parameter initialization. (C14.22 =2);

2. Resboot 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. Reboot the drive;

3. Frequency source: Use potentiometer to set the frequency for LCP with pot;

Use UP/DOWN key ( $\blacktriangledown$ $\blacktriangle$ ) 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]

| VDD |
| FOR | C05.10=8
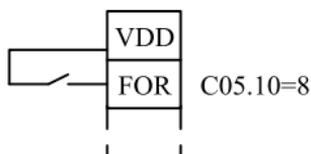
1. Parameter initialization (C14.22=2);

2. Press "AUTO" key on LCP (Digital control and communication control are only active in auto mode);

3. Frequency source: Preset C03.10 or select frequency source by C03.15 C03.16 C03.17;

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

| VDD |
| FOR |
| REV |
| DI1 | C 05.12=23
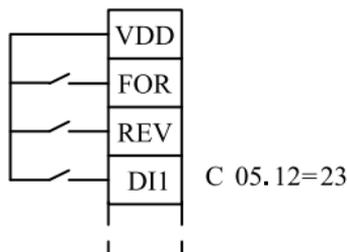
Select the menu with digital input DI1:

| Par. Code | Reference | Parameter Description |
| --- | --- | --- |
| C00.10 | 9 | Multi Set-up |
| C05.13 | 23 | Set-up select |

## 7.5 Potentiometer reference



C03.15=1

1K Ω
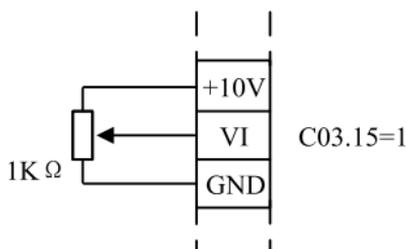
| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C03.15 | 1 | Reference resource 1 |
| C06.14 | ** | Terminal VI Low Reference |
| C06.15 | ** | Terminal VI High Reference |

Note: **indicates this parameter is set according to the actual situation.

## 7.6 Connect two-wire transductor to terminal AI



4-20mA
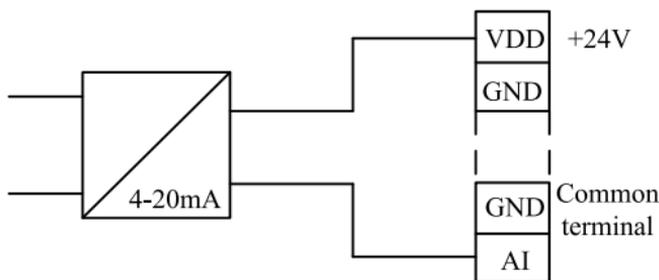
| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C01.00 | 3 | Process closed loop |
| C07.20 | 2 | Select Analog In AI |
| C06.24 | ** | Terminal AI Low Ref./Feedb. value |
| C06.25 | ** | Terminal AI high Ref. / Feedb. value |

Note: **indicates this parameter is set according to the actual situation.

## 7.7 Reference for pulse input
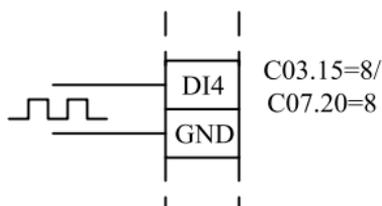


| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C03.15 | 8 | Select reference |
| C07.20 | 8 | Select feedback value |
| C05.15 | 32 | Reference/feedback resource |

## 7.8 Multi-speed
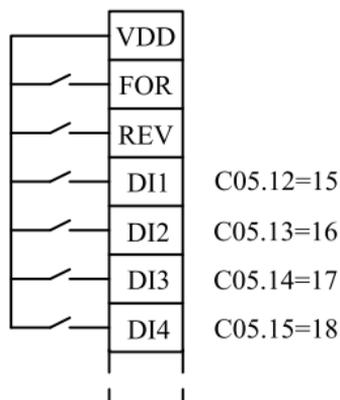


| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C05.12 | 15 | Preset reference bit0 |
| C05.13 | 16 | Preset reference bitl |
| C05.14 | 17 | Preset reference bit2 |
| C05.15 | 18 | Preset reference bit3 |

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
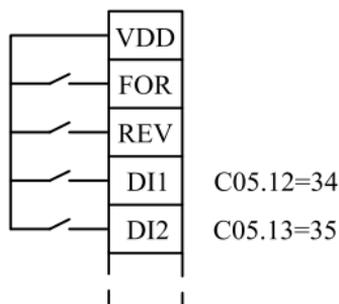
| VDD |
|-----|
| FOR |
| REV |
| DI1 | C05.12=34 |
| DI2 | C05.13=35 |

| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C05.12 | 34 | Ramp bit0 |
| C05.13 | 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
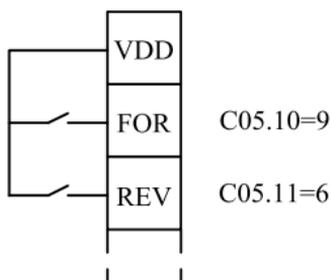
| VDD | |
|-----|---|
| FOR | C05.10=9 |
| REV | C05.11=6 |

| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C05.10 | 9 | Lantched start |
| C05.11 | 6 | Stop inverse |

## 7.11 Digital speed up/down
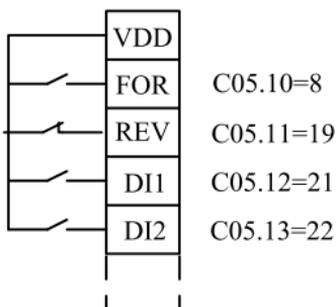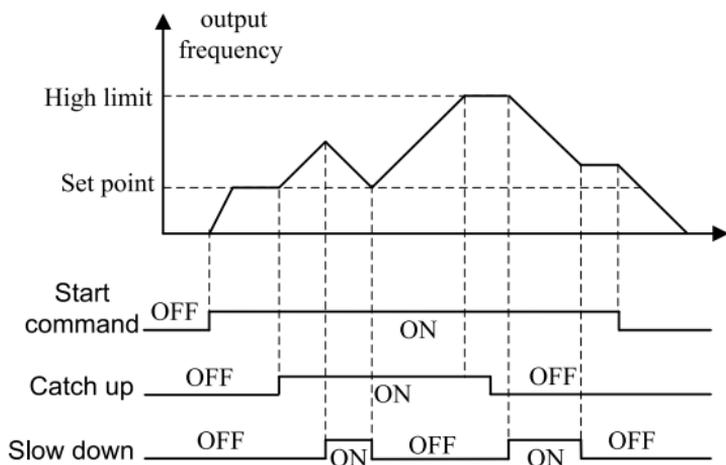
| VDD | |
|-----|---|
| FOR | C05.10=8 |
| REV | C05.11=19 |
| DI1 | C05.12=21 |
| DI2 | C05.13=22 |

| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C05.10 | 8 | Start |
| C05.11 | 19 | Freeze Reference |
| C05.12 | 21 | Speed Up |
| C05.13 | 22 | Speed Down |

## 7.12 Configuration Mode

There is a choice of the following configurations:

1. Speed control, open loop;

2. Speed control, closed loop;

3. Process control, closed loop;

Target resource: Select the reference resource via parameterC03.15, C03.16, C03.17, C03.14, C03.18;
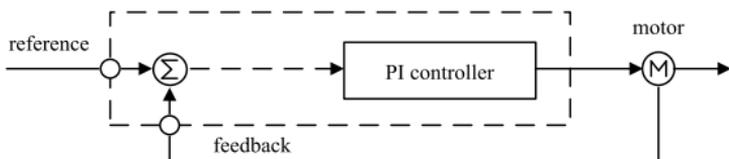


1. Select speed control, closed loop if the application requires a higher rate of accuracy and has encoder feedback signal in speed control. Use the build-in PID controller to maintain constant motor speed.

Feedback resource of the speed control closed loop: Encoder feedback only. (20Hz -l50000Hz)

| Par. Code | Reference | Parameter Description |
|-----------|-----------|----------------------|
| C01.00 | 1 | Configuration Mode |
| C05.70 | ** | Encoder per Revolution |
| C04.12 | ** | Motor Speed Low Limit[HZ] |
| C04.14 | ** | Motor Speed High Limit |
| C07.02 | ** | Speed PID Proportional Gain |
| C07.03 | ** | Speed PID Integral Time |
| C07.04 | ** | Speed PID Differentiation Time |
| C07.05 | ** | Speed PID Diff Gain Time |
| C07.06 | ** | Speed PID Low Pass Time |
| C07.08 | ** | Speed PID Feed forward Factor |

Note: **indicates this parameter is set according to the actual situation.

2. Select Process control, closed loop if the feedback signal is process amount such as pressure temperature etc. Use the build-in PI controller to keep the system stable state.

Feedback resource of Process closed loop: See C07.20:

Example: In a compressor control system, using the potentiometer (0-l0V) to set the desired system pressure. Pressure adjustment range is 0-l0KG, and the use of process closed-loop controller to maintain system pressure constant. PI control is positive, the system pressure to raise, the inverter frequency decreases. On the contrary, pressure drops, the drive frequency increases. Use 4-20mA corresponding to 0-l0KG Pressure transmitter.

| Parameter Code | Reference | Parameter Description |
|----------------|-----------|----------------------|
| C01.00 | 3 | ProcessControl, Closed Loop |
| C07.20 | | Process CL Feedback Resource |
| C06.22 | 4mA | Terminal AI Low Current |
| C06.23 | 20mA | Terminal AI High Current |
| C06.24 | ** | Terminal AI Low Ref./ Feedb. Value |
| C06.25 | ** | Terminal AI High Ref./ Feedb. Value |
| C03.02 | ** | Minimum Reference |
| C03.03 | ** | Maximum Reference |
| C04.12 | ** | Motor Speed Low Limit |

| Parameter Code | Reference | Parameter Description |
|----------------|-----------|----------------------|
| C04.14 | ** | Motor Speed High Limit |
| C07.33 | ** | Process Proportional Gain |
| C07.34 | ** | Process PI Integral Time |
| C07.38 | ** | Process PI Feed forward Factor |

Note: **indicates this parameter is set according to the actual situation.
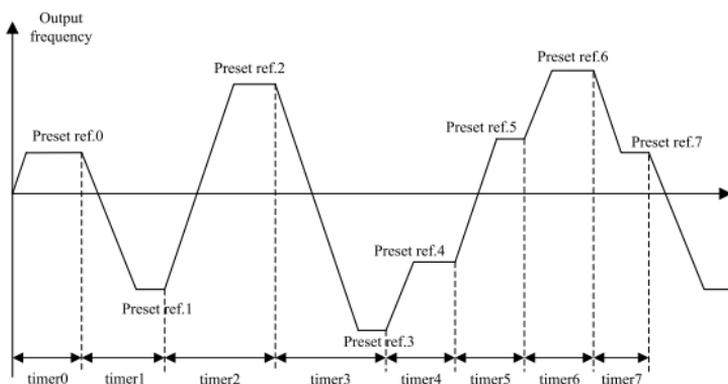
## 7.13 Simple PLC

### 7.13.1 Order Execution

The following figure shows order execution mode of four events/actions:
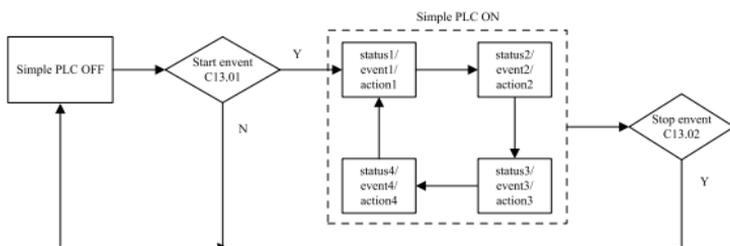


Use order execution to achieve Eight-speed Internal Control Function :

| Parameter | Ref. | Function | Parameter | Ref. | Function |
|-----------|------|----------|-----------|------|----------|
| C03.10[0] | 20 | Preset reference 0 | C13.20[0] | 5 | Timer 0 time |
| C03.10[1] | -40 | Preset reference 1 | C13.20[1] | 10 | Timer 1 time |
| C03.10[2] | 50 | Preset reference 2 | C13.20[2] | 8 | Timer 2 time |
| C03.10[3] | 100 | Preset reference 3 | C13.20[3] | 12 | Timer 3 time |
| C03.10[4] | -100 | Preset reference 4 | C13.20[4] | 15 | Timer 4 time |
| C03.10[5] | -20 | Preset reference 5 | C13.20[5] | 7 | Timer 5 time |
| C03.10[6] | 10 | Preset reference 6 | C13.20[6] | 3 | Timer 6 time |
| C03.10[7] | 80 | Preset reference 7 | C13.20[7] | 6 | Timer 7 time |
| C03.40 | 0 | Ramp 1 Type | C03.50 | 0 | Ramp 2 Type |
| C03.41 | 0.5 | Ramp 1 Ramp up Time | C03.51 | 3 | Ramp 2 Ramp up Time |
| C03.42 | 0.5 | Ramp 1 Ramp down Time | C03.52 | 3 | Ramp 2 Ramp down Time |
| C13.00 | 1 | Order Execution | C03.00 | 1 | -Max-+Max |
| C13.51[0] | | Start Command | C13.52[0] | 29 | Start Timer 0 |
| C13.51[1] | 39 | Start Command | C13.52[1] | 10 | Select Preset ref 0 |
| C13.51[2] | | Start Command | C13.52[2] | 18 | Select Ramp 1 |
| C13.51[3] | | Simple PLC Time-out 0 | C13.52[3] | 30 | Start Timer 1 |
| C13.51[4] | 30 | Simple PLC Time-out 0 | C13.52[4] | 11 | Select Preset ref 1 |
| C13.51[5] | | Simple PLC Time-out 0 | C13.52[5] | 19 | Select Ramp 2 |
| C13.51[6] | | Simple PLC Time-out 1 | C13.52[6] | 31 | Start Timer 2 |
| C13.51[7] | 31 | Simple PLC Time-out 1 | C13.52[7] | 12 | Select Preset ref 2 |
| C13.51[8] | | Simple PLC Time-out 1 | C13.52[8] | 20 | Select Ramp 3 |

| Parameter | Ref. | Function | Parameter | Ref. | Function |
|-----------|------|----------|-----------|------|----------|
| Cl3.5l[9] | 32 | Simple PLC Time-out 2 | Cl3.52[9] | 65 | Start Timer 3 |
| Cl3.5l[10] | | | Cl3.52[10] | 13 | Select Preset ref 3 |
| Cl3.5l[11] | | | Cl3.52[11] | 21 | Select Ramp 4 |
| Cl3.5l[12] | 50 | Simple PLC Time-out 3 | Cl3.52[12] | 66 | Start Timer 4 |
| Cl3.5l[13] | | | Cl3.52[13] | 14 | Select Preset ref 4 |
| Cl3.5l[14] | | | Cl3.52[14] | 18 | Select Ramp 1 |
| Cl3.5l[15] | 51 | Simple PLC Time-out 4 | Cl3.52[15] | 67 | Start Timer 5 |
| Cl3.5l[16] | | | Cl3.52[16] | 15 | Select Preset ref 5 |
| Cl3.5l[17] | | | Cl3.52[17] | 19 | Select Ramp 2 |
| Cl3.5l[18] | 52 | Simple PLC Time-out 5 | Cl3.52[18] | 68 | Start Timer 6 |
| Cl3.5l[19] | | | Cl3.52[19] | l6 | Select Preset ref 6 |
| Cl3.5l[20] | | | Cl3.52[20] | 20 | Select Ramp 3 |
| Cl3.5l[21] | 53 | Simple PLC Time-out 6 | Cl3.52[21] | 69 | Start Timer 7 |
| Cl3.5l[22] | | | Cl3.52[22] | l7 | Select Preset ref 7 |
| Cl3.5l[23] | | | Cl3.52[23] | 21 | Select Ramp 4 |
| Cl3.5l[24] | 54 | Simple PLC Time-out 7 | Cl3.52[24] | 1 | No Action |
| If Cl3.52 [24] is set to "stop", the internal control eight-speed will perform only one week, not cycles. | | | | | |

## 7.13.2 Parallel Execution

The following figure shows parallel execution mode of four events/actions:
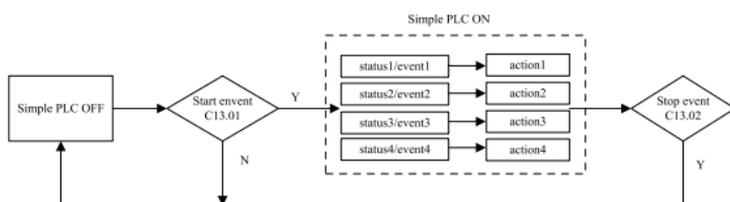


Example:

1. Start event

Cl3.0l = [33] Enter the start event via digital input terminal FOR;

Cl3.00) = [2] Simple PLC parallel control mode;

Cl3.02 = [20] the inverter issues an alarm and trips to stop.

2. Event/Action:

Event status 2(Cl3.5l [2]) = [34], entered via terminal REV;

Event status 3 (Cl35l [3]) = [40], the drive stops in any way;

Action 2(Cl352 [2]) = [22] If the REV input is true, then, start the drive;

Action 3(Cl352 [3]) = [40] If the drive has stopped, reset counter A;

Note: If event 2 is true, action 2 will be executed; if event 2 is false, but considering terminals  local bus excites the inverter to stop, action 3 will be executed.

3. Stop Event:

If stop event /Cl302 is true, Simple PLC will be disabled, and Cl6.38 will be reset to 0.

# Chapter 8 Accessory Specification

## 8.1 Braking Resistor

When the motor acts as a generator, the braking resistor consumes surplus energy resulting from motor braking to achieve fast stop. And to prevent the intermediate circuit voltage is too high to trip eventually.

Note: The braking resistor will be very hot, and will have a risk of fire, if the transistor in the braking unit is damaged and shorted. The installation length of the braking resistor should be not less than 5 meters.

Brake resistor (option):

| Model | Braking Resistor Specification | | Suitable Motor(KW) |
|---|---|---|---|
| | Ω | KW | |
| HLP-B0D3721 | 310 | 0.25 | 0.37 |
| HLP-B0D7521 | 145 | 0.065 | 0.75 |
| HLP-B01D521 | 65 | 0.25 | 1.5 |
| HLP-B02D221 | 50 | 0.285 | 2.2 |
| HLP-B0D3723 | 310 | 0.25 | 0.37 |
| HLP-B0D7523 | 145 | 0.065 | 0.75 |
| HLP-B01D523 | 65 | 0.25 | 1.5 |
| HLP-B02D223 | 50 | 0.285 | 2.2 |
| HLP-B03D723 | 25 | 0.8 | 3.7 |
| HLP-B0D7543 | 620 | 0.065 | 0.75 |
| HLP-B01D543 | 310 | 0.25 | 1.5 |
| HLP-B02D243 | 210 | 0.285 | 2.2 |
| HLP-B03D043 | 150 | 0.43 | 3.0 |
| HLP-B04D043 | 110 | 0.6 | 4.0 |
| HLP-B05D543 | 80 | 0.85 | 5.5 |
| HLP-B07D543 | 65 | 1 | 7.5 |
| HLP-B001143 | 40 | 1.8 | 11 |
| HLP-B001543 | 30 | 2.8 | 15 |
| HLP-B018D543 | 25 | 3.5 | 18.5 |
| HLP-B002243 | 20 | 4 | 22 |

## 8.2 Remote Mounting Kit

A remote mounting kit for keyboard contains the following 2 items: 1 fixed sheet metal, and 1 HLP-B extension cable.

Keyboard extension cable has the following specifications: 1m, 2m, 3m, 5m, 7m, 10m, 15m.

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:

| | |
|---|---|
| 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:<br><br>4×Ø3　　58<br><br>90 | Step 2: Install the LCP according to the direction of the arrow. |
| Step 3: Install the fixed sheet metal on the back of the control panel in the direction of the arrow.<br><br><br>This sheet metal applies on the control panel with the thickness of 1.5mm and bigger. For other thickness panels, fixed the foot of sheet metal manually. | Step 4: Install the communication cable and tighten it with screws. |
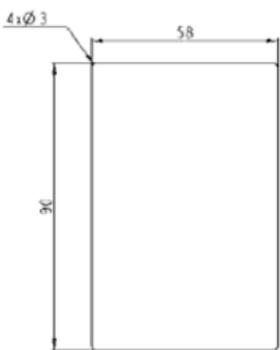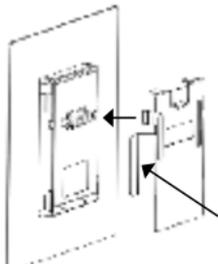
# Chapter 9 EMC

## 9.1 EMC−Correct Installation

HLP-B serials drive implement the latest international standards, following these guidelines is advised, IEC/EN6l800-3: 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 earthling;
- 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 | Trip / Lock | 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-B 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. |

| No. Code | Fault Description | Warning | Alarm / Trip | Trip / Lock | Error | Reason analysis |
|---|---|---|---|---|---|---|
| 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) |
| 16 | Short Circuit | | X | X | | Short circuit in motor or on motor terminals. |
| 17 | Control Word Timeout | X | X | | | Drive communication timeout, this alarm occurrs 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. |

| No. Code | Fault Description | Warning | Alarm / Trip | Trip / Lock | Error | Reason analysis |
|---|---|---|---|---|---|---|
| 26 | Brake Overload | X | X | | | Beyond the brake power limits |
| 27 | Brake transisitor short-circuit | | X | | | Brake transistor is short circuit leading brake function invalid. |
| 28 | Brake Detect | | 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 | DO1 Overload | X | | | | Terminal DO1 is overload. |
| 41 | DO2 Overload | X | | | | Terminal DO2 is overload. |
| 44 | Earth Fault | | X | X | | Discharge from output phases to ground (22KW or more) |

| No. Code | Fault Description | Warning | Alarm / Trip | Trip / Lock | Error | Reason analysis |
|---|---|---|---|---|---|---|
| 47 | 24V Power Card Fault | | X | X | | 24V voltage power card failure |
| 48 | VDD Low Voltage | | X | X | | VDD Voltage is too low. |
| 5l | 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 Paremeter 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 | | | Contace Local distributor or Holip Company. |
| 59 | Current Limit | X | | | | Current exceeds value set in C04.l8. |
| 6l | Feedback Error | X | X | | | Feedback signal is out of range. |

| No. Code | Fault Description | Warning | Alarm / Trip | Trip / Lock | Error | Reason analysis |
|---|---|---|---|---|---|---|
| 63 | Mechenical 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. |
| 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 | Paramete Database Busy | | | | X | LCP and RS485 connection try to updata parameter at the same time. |
| 9l | 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. |

| No. Code | Fault Description | Warning | Alarm / Trip | Trip / Lock | Error | Reason analysis |
|------|------|------|------|------|------|------|
| Err | Unchangbale | | | | X | Parameter is freezed or can't be changed during running. |

## 10.2 Fault Indication and Trouble Shooting

The inverter of HLP-B serials 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 disposaled, please contect the distributor or Holip company.

| Fault | Process Method |
|------|------|
| 1. Motor runs unsteadily | Motor runs unsteadily but no warnings issued, may be motor parameter settings are not correct, please adjust motor parameter settings, if no effect, please contact Holip Company. |
| 2. Motor can't rotate | 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. |
| 3. Motor brake function can't be performed. | Please refer to braking function section; |

| Fault | Process Method |
|---|---|
| 4. No fault message or screen display | Confirm whether the input fuse meltdown;<br>Verify whether control card is overload;<br>Suppose control card is overload, and 24V is shorted, please remove the connection of control terminal;<br>Make sure if any fault message is displayed, and if no, please contact Holip Company; |
| 5. Motor can't rotate and screen display is normal without fault message | Press [Enter] on LCP;<br>Make sure whether the screen is active i.e. the screen display can't be switched or parameter can't be edited;<br>Suppose screen is freeze, please make sure screened cable used and connected correctly;<br>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. |

# Chapter 11 Maintenance

## 11.1 Note

Confirm the main circuit power supply has been turned off, and the display has disappeared before carry 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 unexpected 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 -l0 ~40 , 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 -65 ;
- 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 -70 ;
- The relative humidity of transport ambience must be less than 95% (Ambient temperature is 40 ).

Attention: It is better not to store the inverter for long time. 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.