Firmware Manual(Standard Control Procedure)

ES580/850 Series(0.37 to 630 kW)

ES350 Series(0.37 to 4.0 kW)

Other series in accordance with the machine model.



CUMARK

Introduction

Thank you for using the leading motor drive product ES series .

This manual will provide you with a list of parameters of the drive, and the necessary information for debugging and operation. It is used for the technical personnel who conduct design, debugging, using and maintainance to the drives.

This series of drives is the latest launch by our company with the features of high reliability, high-performance, multifunction and the intelligent AC motor drive. Stable, reliable, intelligent and easy of using are the highlight features. The content of manual includes basic technical parameters of the drive, control keyboard operation, fault handling as well as the relevant operation methods and caution matters.

In order to ensure that you can use this series of drives correctly, making full use of the excellent performance of the product , the safety of the user and equipment, please read this manual in detail before starting any operation to the drive. Meanwhile, reader should have basic knowledge of electrical wiring, electrical components and electrical principle diagram symbols. The incorrect use of the drive may cause abnormal operation, failure or even accidents such as damage to the equipment, injuried and fatality!

In order to enhance the adaptability of the manual, we will use “drive” in the following content to intead of the description of the usual inverter, motor controller, energy saving device,etc.

Since we are always committed to the continuous improvement of products and related information, the information provided by the company is subject to change without notice.

For the latest changes and more content, please contact our office or visit our website

www.cumark.com.cn

Firmware Manual(Applicable to standard control procedures)

1. Manual Introduction

Content

Describes the contents of the manual, as well as introduces the information about applicability, safety and target readers.

Applicability

This manual is applicable to standard control procedures.

Safety Introduction

Please comply with all safety instructions submitted by the drive.

• Please read the complete safety instructions before installing, debugging or using the drive. The complete safety information is given in the front of the drive【Hardware manual】.

•Please read the warnings and precautions of this software before modifying the default value for a function. For each function, this manual is given in the introduction of user adjustable parameters should pay attention to the warnings and precautions.

Target Readers

Readers of this manual should have the basic knowledge of standard electrical wiring, electronic components and electrical schematic symbols.

Main Contents Introduction

This manual contains the following chapters：

•**Control Keyboard** provides a description of the control keyboard and instructions for use.
•**Program Function** introduces the basic functions and characteristics of the drive and the main implementation methods.
•**Driver Parameter List** describes the parameters of the drive.
•**Field Bus** introduces the main communication characteristics and mechanism of the drive and other relative settings.
•**Fault Tracking and Processing** lists alarm (warning) and fault information as well as possible causes and solutions.

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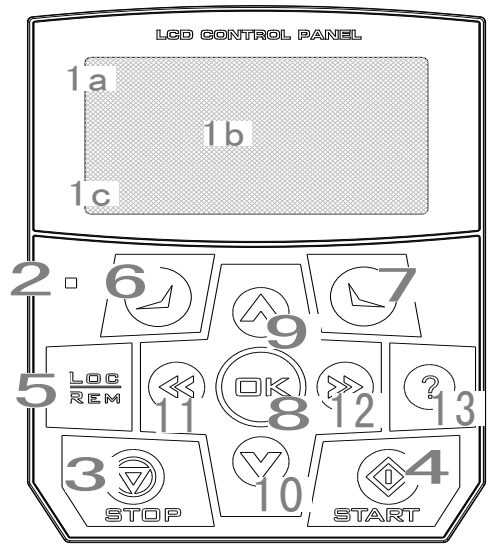
■ 2.LCD Control Keyboard

The following content describes the function and operation of the control keyboard. The control keyboard can be used to control the drive, read the status data and set the parameters. For more features and introduction of electrical and mechanical installation please refer to【**Hardware manual**】.

Features

- Control keyboard equipped with LCD display text, digital and graphic multielement display.
- Parameter can be copied to the control keyboard memory, so as to be able to transfer these parameters to other drives in the future, or for a specific system backup.
- Rich text tips and help.
- Real-time monitor drive DC bus voltage.

Layout

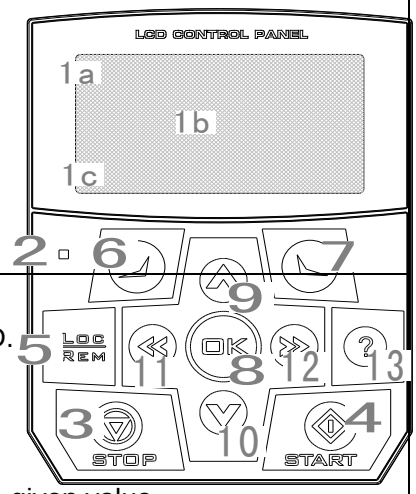


The Information displayed on the LCD panel is the basic status of the drive



Serial Number	Field	Options	Implications
①	The controlling site	LOC	Drive is in local control mode that is controlled by keyboard.
		REM	Drive is in remote control mode that is controlled via the I/O port or field bus.
②	Status	↻	Drive stopping, the starting direction is positive.
		↺	Drive stopping, the starting direction is reverse.
		Rotation Arrow 	Drive running, the output equals to the given.
		Dotted Line Rotation Arrow 	Drive running, the output does not equal to the given range.
		Static Arrow	Drive running, the output is equal to 0.
		Empty	Running is prohibited, such as under voltage, no permitting start signals, etc.
③	Control Keyboard Operation Mode		• Name of the current mode. • Name of the display menu, list or text.
④	Given value or the serial number of selectied items		• Display the given value after returning to the main interface . • Showing the code of selected items after entering the menu, for example, the code of menu and so on.

Serial Number	Key functions and Applications
1	**LCD display-**Divided into three main area, respectively as： **Screen top status bar**-Display content change which is related to operation mode. **Screen central**-Show the current context of the interface. Specific content varies depending on the mode of operation. **Screen bottom**- Show the specific function of the two functional keys and DC Bus voltage.
2	【**Status LED**】**Green light** =Normal operation；**Flashing green light** = Current alarm exists；**Red light** = Current fault exists.
3	【**Stop**】**key-**Stop the drive in local mode.
4	【**start-up**】**key**-Start up the drive in local mode.
5	【**Local / remote**】**key**-Switch between the local control mode and the remote control mode.
6	【**Left function**】**key** The function is related to the mode and status of the keyboard. The lower left corner of the screen shows the function of the key.
7	【**Right function**】**key** The function is related to the mode and status of the keyboard. The lower right corner of the screen shows the function of the key.
8	【**confirm**】**OK key** After entering the menu, the function is the same as the right function key. After returning to the main interface, the LCD display screen displays the value and unit of the signal in the center when it is normal. Press the key to switch the display signal input source.
9	【**Upward**】**key** Scrolls up the menu, list or text on central screen of LCD. Increases the value of the selected parameter when editting a numeric type and a bit pointer type parameter. After returning to the main interface,increase the given value if the upper right corner highlights . Press this key to quickly modify the parameter value or the given value.
10	【**Downward**】**key** Scrolls down the menu, list or text on central screen of LCD. Decreases the value of the selected parameter when editing a numeric type and a bit pointer type parameter. After returning to the main interface,reduce the given value if the upper right corner highlights . Press this key to quickly modify the parameter value or the given value.
11	【**To the left**】**key** Execute retral back flip action when LCD displays central display menu, List or text. When editing a numeric type and bit pointer type parameters, move the cursor to the left; editing the Bitset type parameter, and then selects the value of the selected bit. Switch the monitor page when after returning to the main interface.
12	【**To the right**】**key** Execute forward action flip when LCD display central display menu,List or text. When editing a numeric type and bit pointer type parameters, move the cursor to the right; editing the Bitset type parameter, and then select the value of the selected bit. Switch the monitor page when after returning to the main interface.
13	【**Help**】**key** Press this key, the central LCD shows the relavant help information. Press the key again to restore the contents shown before.



Operation Instructions

Basic Operation

Users can use the menu and buttons to help controlling the operation of the keyboard. These bottons includes the left and the right two functional keys. The current functions of the functional keys are displayed respectively in the bottom of the LCD on the left and right sides.

Initially, the control keyboard is in the main interface, as shown in Figure 1. The upper right corner of the LCD shows the current given value. The LCD shows up to 3 signals in one page for real time monitoring to the drive. 3 signals constitute one monitoring page. Up to 8 pages, totally 24 signals can show. Each signal can be flexibly indicated to any of the parameters of the drive.

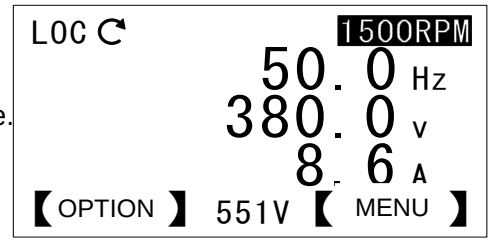


Figure 1 Main Interface

When a fault or warning occurs, the information of fault or warning pop-up,as shown in figure two, Press the left functional key to reset the fault. Then the right functional key loses its effect.Press the navigation keys(up and down for four direction keys), you can hide faults or warning messages. If it lasts 3 seconds (fault) or 30 seconds (alarm) and no keys act, the fault or warning message will pop up again. Meanwhile, the warning messages will disappear automatically after the warning end.

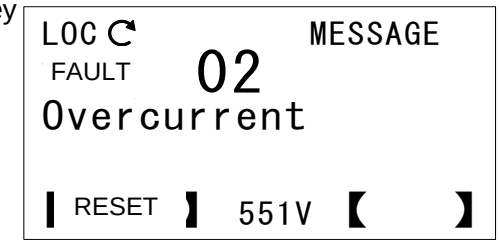


Figure 2 Fault / Alarm

In the main interface, press the right functional key to enter the main menu as shown in Figure 3. There are 8 submenus in the main menu including: parameter list, modified parameters, fault log, parameter change log, assistant, parameter backup, system information and settings. Each submenu implements a specific function, for example, parameter list is used to view and edit the drive parameter; the fault log is used to view the recent failures of the drive, as well as to see the fault diagnosis information.

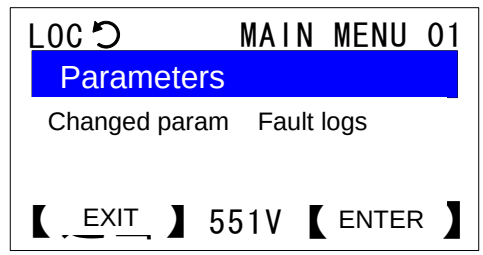


Figure 3 Main Menu

In the main interface, press the left functional key to enter the options menu as shown in Figure 4.
There are a total of 3 submenus in the option menu: local given,motor rotation direction and edit main interface. Thereinto, the local given is used to modify the local given value, motor rotation direction for switching the motor steering; edit main interface for selecting the monitoring signal of the main interface.

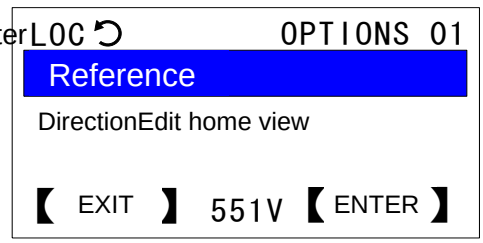


Figure 4 Options Menu

Enter the main menu or options menu, use the up and down arrows keys,or use the left and right arrows to perform actions until the specified menu page, or a list of contents is selected. **Press the right functional key or confirm key to enter the next menu. Press the left functional key to return to the previous menu.** Particular, when entering the last menu to edit the selected items, such as access to the parameter edit menu to modify the parameter value. **Press the right functional key or confirm key to save for changes. Press the left functional key to abandon the modifications.** However it will be returned to the previous menu by pressing in any one of the three. At the same time, press the left functional key and hold, it can gradually return to the previous menu until to the main interface.

Under any mode, user can control drive start and stop in local control mode, or switch between local control mode and remote control mode. Meanwhile, if the help information exists, users can press the help button to view the help information.

Task list

Basic operation task	**Page number**
How to acquire for help	12
How to control drive start & stop and switch local & remote control mode	12
How to modify speed,frequency or torque given value	12
How to switch monitoring signal and view input source of monitoring signal	13
How to select a monitoring signal and view or edit its input source	25
How to adjust backlight brightness and contrast ratio of LCD display	14
How to select a parameter and view its value	15
How to modify values of numeric type parameters	15
How to modify the value of an enumerated type parameters	16
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How to modify the value of the numeric pointer type parameters	17
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How to use the assistant to set the drive start stop control parameters	21
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How to transfer parameters to drive (parameter download)	22
How to view drive manufacturer, model, firmware version, production date and serial number info	23
How to view control keyboard firmware version and diagnostic information	23
How to clear drive fault logs	24
How to restore default monitoring signal on main interface	24
How to initialize all parameters of the drive	24

Terms in English and Chinese

ALARM 警告	BACK 返回	CANCE 取消	DONE 完成
EDIT 编辑	ENTER 进入	EXIT 退出	FAULT 故障
HELP 帮助	LOC 本地	MENU 菜单	MESSAGE 消息
OK 确认	OPTION 选项	REM 远程	RESET 复位
SAVE 保存	SELECT 选择	START 启动	STOP 停止

Primary Menu in English and Chinese

Parameters	参数列表
Changed param	修改过的参数
Fault logs	故障日志
Param change logs	参数更改日志
Assistants	助手
Param backup	参数备份
System info	系统信息
Settings	设置

Option Menu in English and Chinese

Reference	本地给定
Direction	电机旋转方向
Edit home view	编辑主界面

Operation Mode in English and Chinese

MAIN MENU	主菜单
PARAM GROUPS	参数组
CHANGED PARAM	修改过的参数
FAULT LOGS	故障日志
PRM CHG LOGS	参数变更日志
ASSISTANTS	助手
PARAM BACKUP	参数备份
SYSTEM INFO	系统信息
DRIVE INFO	驱动器固件版本信息
PANEL INFO	控制键盘固件版本信息和诊断信息
SETTINGS	设置
LANGUAGE	选择语言
DISPLAY PARAM	设置 LCD 显示参数
INITIALIZE	初始化（恢复默认）
OPTIONS	选项菜单
LOC REF EDIT	编辑本地给定
DIRECTION	设置电机旋转方向
HOMEVIEW EDIT	编辑主界面

Arbitrary Pattern

How to acquire for help

Step	Action	Display
1	If there is a help information, press the **help key** to pop up the help information.	LOC HELP Output display shows drive status, refere- nce value and signals . Use Up/Down arrow key to adjust refere- 【 EXIT 】 551V 【 】
2	If the help information content length exceeds the text length that LCD screen can display, you can press the navigation key (up and down or so four direction keys) for scrolling and turning the page, browse the remaining content.	LOC HELP nce. Use Left/right arrow key to switch between maxium 8 pag- es of signals. 【 EXIT 】 551V 【 】
3	After reading all the content, you can press the left **functional key** or press the **help key** again to exit this mode.	

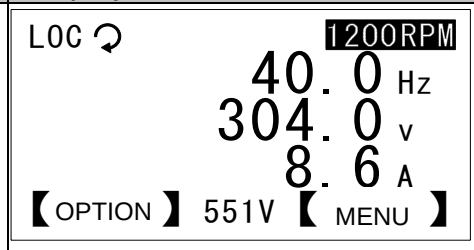
How to control drive start-stop and switch local / remote control mode

Step	Action	Display
1	Switching between the remote control mode(Status bar on the left shows the words REM)and Local control mode (Status bar on the left show the words LOC), press the LOC/REM key. Note: this function is locked when the drive running. Using the parameters of *16.00Locallock*(Local control locking)to disable the drive to enter the local control mode.	LOC MESSAGE Drive cannot switch control mode at run time. 【 EXIT 】 551V 【 】
2	To **stop** the drive in the local control mode, press the STOP key. To **start** the drive in the local control mode, press the START key.	

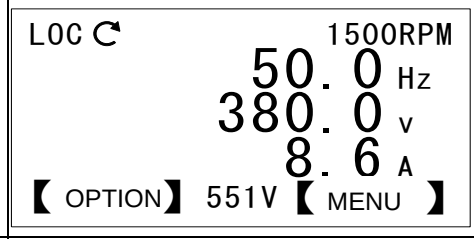
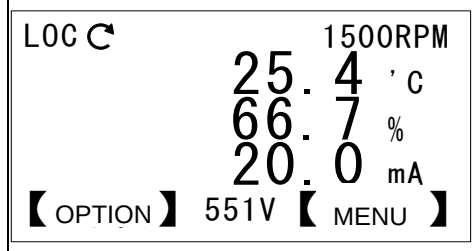
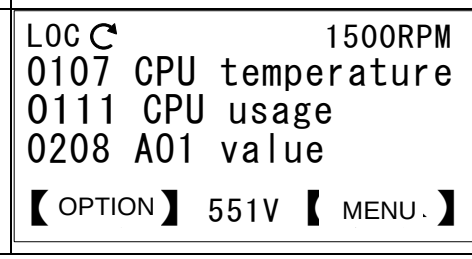
Main Interface Mode

How to modify the speed, frequency or torque given value

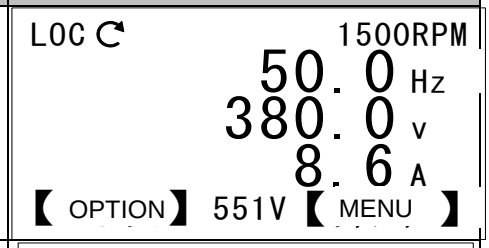
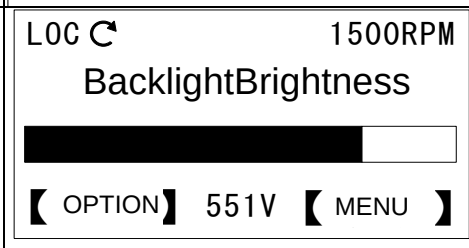
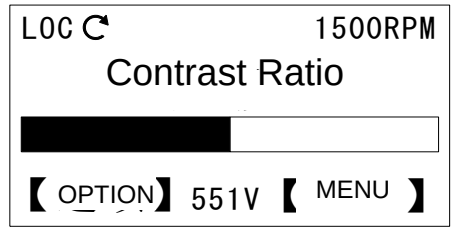
Step	Action	Display
1	If it is not in the main interface, press the left functional key again till the return to the main interface.	LOC 1500RPM 50.0 Hz 380.0 V 8.6 A 【OPTION 】 551V 【 MENU 】
2	If the given value is not in the highlighted status, it indicates that the given value cannot be modified. At this point, you can switch to the local control mode or modify the given source to keypad.	LOC 1500RPM 50.0 Hz 380.0 V 8.6 A 【 OPTION 】 551V 【 MENU 】

Step	Action	Display
3	Press the up arrow to increase the given value, press the down arrow to reduce the given value. Press one of the two and keep not to loose, the settings will change quickly and the modified value will take effect immediately. The given value will be saved to the permanent memory of the drive, and will automatically recover after the power is turned off.	

How to switch the monitoring signal and view the input source of the monitoring signal

Step	Action	Display
1	If it is not in the main interface, press the left function key again till the return to the main interface.	
2	Use the left and right arrow keys to switch between up to eight monitor pages.	
3	Hold down the confirmation key to view the input source of the signal.	

How to adjust the backlight brightness and the contrast of LCD display

Step	Action	Display
1	If it is not in the main interface, press the left function key again till the return to the main interface.	
21	If it is not in the main interface, press the left function key again till the return to the main interface. Hold the right function key and press the up and down arrows to adjust the backlight brightness of the LCD display.	
32	If it is not in the main interface, press the left function key again till the return to the main interface. Hold the left function key and press the up and down arrows to adjust the contrast ratio of the LCD display.	

Main Menu Mode

Parameters List

Parameter Type

English	Chinese	Define
INT16	16bit signed integer	Maximum value range of [-32768, 32767] parameters
UINT16	16bit unsigned integer	Maximum value range of [0, 65535] parameters
ENUM	Enumeration	A list of several options
PB	A set of	A collection of up to 16 Boolean variables
VAL POINTER	Value pointer	A pointer to another parameter, which takes the value of another parameter as its own value
BIT POINTER	Bit pointer	A pointer to a binary bit of another parameter, that is, takes the value of a binary bit of another parameter as its own value.

INT16,UINT16 and other types of parameters are collectively referred to as numeric type parameters.

Parameter address forms as xx.yy

Xx refers to the group number of the parameter, while yy refers to the index that the parameter within the group. For example, 01.00 represents the first parameter of the first group, 16.04 represents the fifth parameter of the sixteenth group. **Take note that the index begins from 0.**

Numeric pointer coding

b15 b8	b7 b0
Group number	Indexes

For example, the value of the numeric pointer is equal to 256 (decimal) or 0100 (hexadecimal), indicating that the pointer points to the first set of the first parameters.

Bit pointer encoding：

b15 b10	b9 b4	b3 b0
Group number	Indexes	A domain

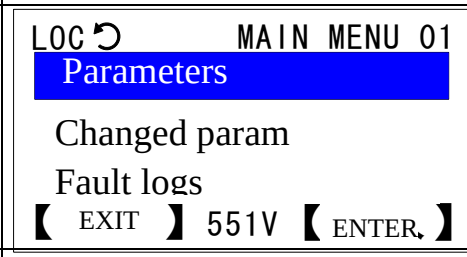
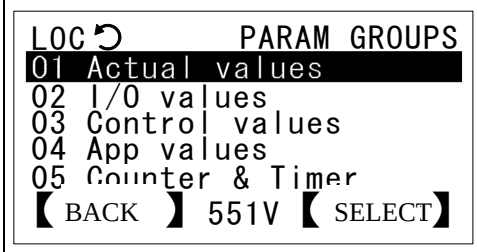
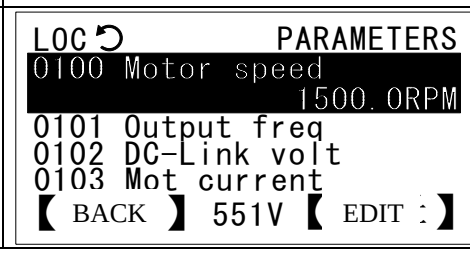
for example,The value of the bit pointer is equal to 1024 (decimal) or 0400 (hexadecimal), indicating that the pointer points to the first set of the first parameters of the binary bit.

Note that the minimum value of the bit field is 0

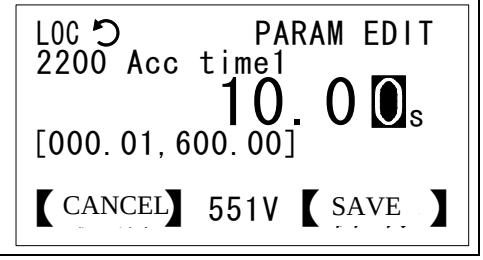
Pointer parameter table in English and Chinese

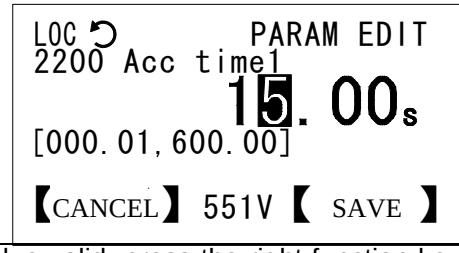
POINTER	指针
Always equal to 0	一直为 0
Always equal to 1	一直为 1
User-define	用户自定义

How to select a parameter and views its value

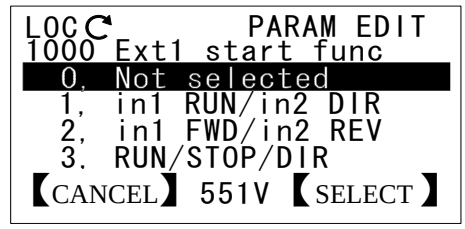
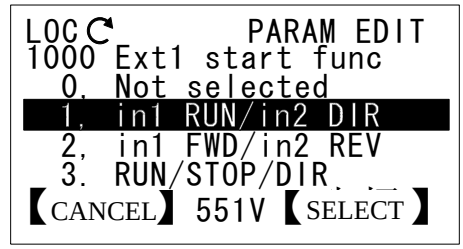
Step	Action	Display
1	If in the options menu, press or hold down the left function keys to return to the main interface.	
2	If in the main interface, press the right function button to enter the main menu, otherwise press the left function key repeatedly until the return to the main menu. Use the navigation keys (up and down or so four direction keys) and select the parameter list, press the right function key or the OK button to enter the submenu of the parameters.	
3	**The first two digit numbers of each line that displayed in the central part of the LCD are the parameters set number.** Initially, the first set of parameters is selected (highlighted). Using the navigation keys (up and down or so four direction keys) to select the specified parameter group of parameters, then press the right function key or the OK botton to enter the parameter view mode.	
4	**The first four digit numbers of each line that displayed in the central part of the LCD are the parameters address.** Initially, the first parameter is selected, and the current value of this parameter is displayed next (highlighted).Use the navigation keys (up and down or so four direction keys) to select the appropriate parameters to view its values.	

How to modify values of numeric type parameters

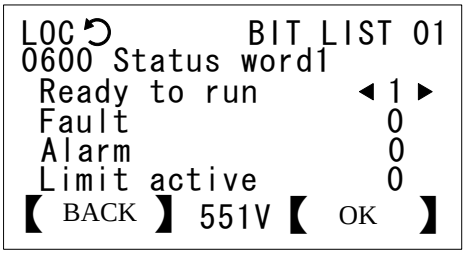
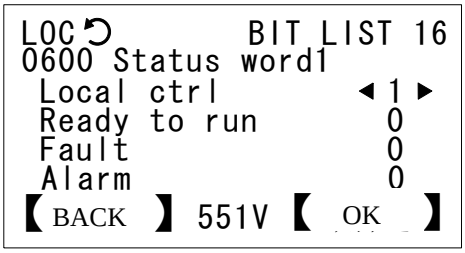
Step	Action	Display
1	Select a numeric type parameter and then press the right function key or the OK botton to enter the parameters edit mode. For this type of parameter, the first line of the central LCD shows its address and name,the second line shows its current value and unit, while the third line shows its range.	

Step	Action	Display
2	**Use the up and down arrow keys to modify the value of the selected parameter, while pressing the two keys can restore its default value**. The initial cursor is located in the unit position of the parameter value (highlighted), press the left and right arrow keys to move the cursor. Press the up and down arrow keys, the parameter values change quickly.	
3	To save the modification to make the new value valid, press the right function key or the OK bottton. To discard the modification and keep the original value, press the left function key.	

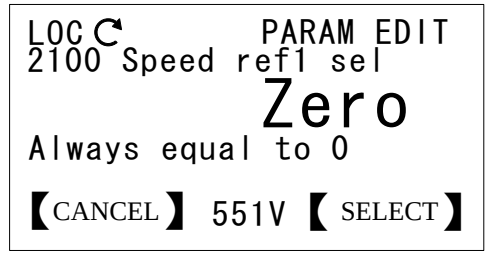
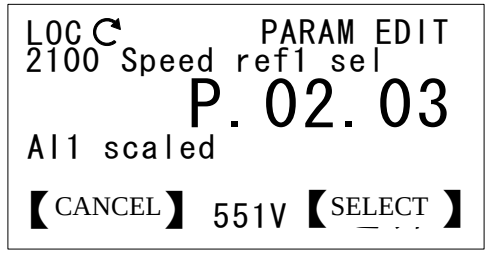
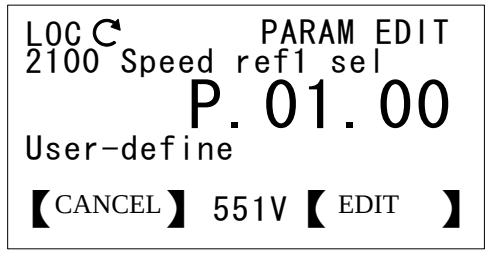
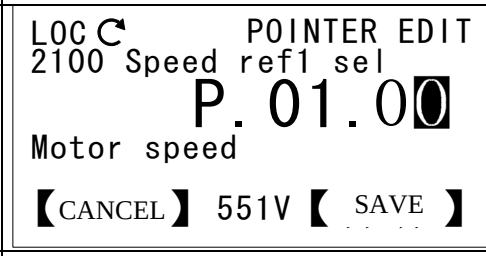
How to modify the value of enumeration type parameters

Step	Action	Display
1	Select an enumeration type parameter and press the right function key or the OK botton to enter the parameter edit mode. For this type of parameters, LCD display lists a number of options in the center, the current options hightlighted. **The number in front of each option is its value.**	
2	**Use the up and dow direction keys to scroll the list of options, press the two buttons at the same time can restore the default options.** Press the left and right arrow keys can perform flip action. Press the navigation key (up and down or so four direction key), the option list changes quickly.	
3	To save the modification to make the new value valid, press the right function key or the OK bottton. To discard the modification and keep the original value, press the left function key.	

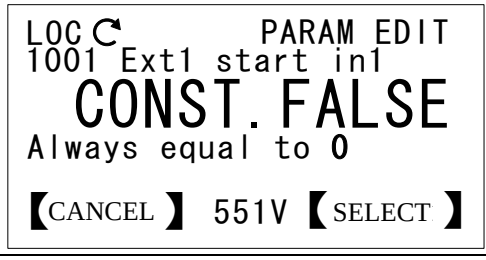
How to view or modify the values of bit set type parameters

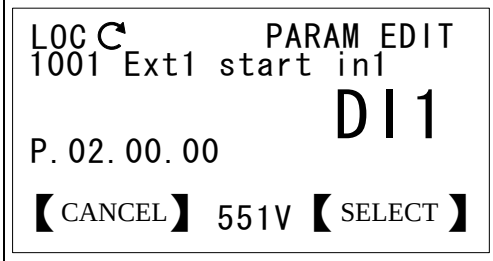
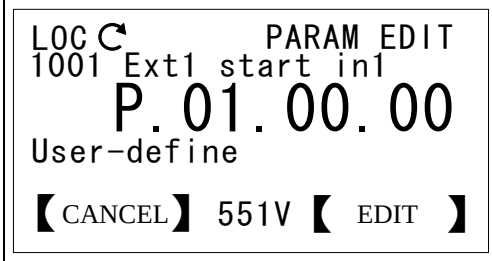
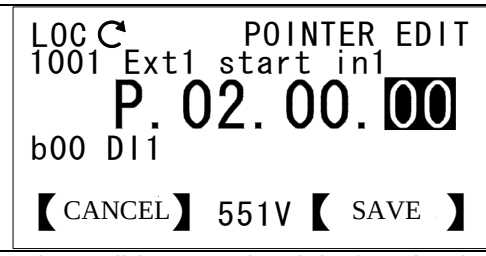
Step	Action	Display
1	Select a bit set type parameterand press the right function key or the OK botton to enter the parameter edit mode. For this type of parameter,the central LCD display lists a number of bit variables. **The current value of each bit variable is displayed on the right side, the bit number of the currently selected bit variable is displayed in the upper right corner.**	
2	**Use the left and right arrow keys to modify the value of the bit variable,while pressing these two keys can restore its default value.**Initially, the first bit variable in the list of bit variables is selected (two solid triangles on the right),press the up and down direction keys to scroll the list	
3	To save the modification to make the new value valid, press the right function key or the OK bottton. To discard the modification and keep the original value, press the left function key.	

How to modify values for numeric pointer type parameters

Step	Action	Display
1	Select a numeric pointer type parameter and press the right function key or the OK botton to enter the parameter edit mode. For this type of parameter, the firrst line of the central LCD display shows the address and name of the parameter, the second line shows the value of the pointer, while the third line shows the name of the pointer to the parameter.	
2	The control keyboard provides at least two options for this type of parameter: Always 0 and user defined.**Use the up and down direction keys to select one of them, while pressing these two keys at the same time can restore its default value.** Then the left and right direction keys lose effect.	
3	If in the previous step, the user selected other options other than the user defined, press the right function key or the OK botton, the control keyboard then saves changes to make the new values effective. Otherwise the control keyboard will enter into the numeric pointer edit mode. To give up modification and keep the original value, press the left function key.	
4	**Use the up and dow arrow keys to change the value of the pointer, while pressing these two keys at the same time can restore its default value.** Initially, the cursor is located in the index field of the numeric pointer, press the left and right arrow keys to move the cursor.	
5	To save the changes to make the new value to take effect, press the right function key or the OK botton; to discard the user-defined and return to the parameter edit mode, press the left function key.	

How to modify the value of a bit pointer type parameter

Step	Action	Display
1	Select a bit pointer type parameter to enter the parameter edit mode by pressing the right function key or the OK botton. For this type of parameter, the first line of the LCD shows the address and name of the parameter, the next two lines show the value of the pointer and the name of the direction of the variable.	

Step	Action	Display
2	The control keyboard provides at least three options for this type of parameter：Has been 0,Has been 1 and user-defined. **Use the up and down arrow keys to select one of them,while pressing these two keys at the same time can restore its default value,**then the left and right direction keys out of action.	
3	If in the previous step, user selected other options other than the user-defined, press the right function key or the OK botton , then the control keyboard saves the changes to make the new value effect; Otherwise, the control keyboard will enter into the bit pointer edit mode. To give up the modification and keep the original value, press the left function key.	
4	**Use the up and down arrow keys to modify the value of the pointer, while pressing these two keys at the same time can restore its default value.** Initially, the cursor is located in the bit point field; press the left and right arrow keys to move the cursor.	
5	To save the modification to make the new value valid, press the right function key or the OK bottton. To discard the modification and and return the parameter edit mode, press the left function key.	

Parameter access message

Category	English	Chinese	Reason
1	This parameter is read only.	This parameter is read-only.	Parameter attribution is read-only.
2	Can not edit this parameter while the drive is running.	This parameter cannot be modified while the drive is running.	Parameter attribution is non-modification during the operation.
3	Parameter list is updating, this could take several seconds, please wait.	The parameter list is being updated. This process may last for a few seconds. Please be patient.	When accessing the modified parameters, the control keyboard is updating the parameter list, and the user is trying to edit an unfinished updating parameter.
4	OK! Done.	Operation completed.	
5	Oops! Failed.	Operation failed.	Communication exception occured while reading / saving parameters.
6	Parameter group list is updating, please wait awhile.	The parameter list is updating, please wait for a moment.	When selecting a parameter group, the control keyboard is updating the list of parameter groups. Button interval is too small or communication exception will trigger this event.

Modified parameters

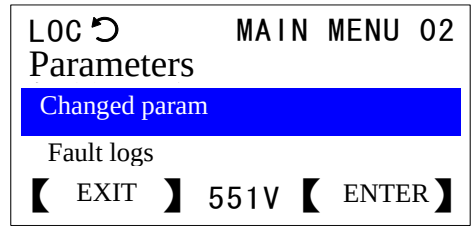
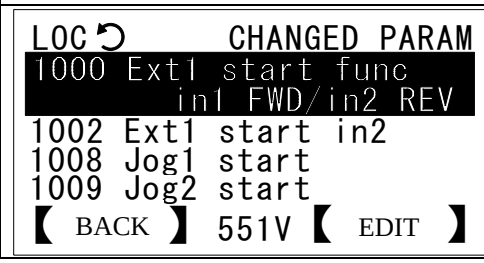
With this option, the user can：

1. Check the modified parameters

2. Edit the modified parameters

Note that the control keyboard can determine whether the parameter has been modified in terms of the attribute that the drive read the parameters, the current value and the default value. This process may take several seconds to tens of seconds, please wait with patience. The parameter list updated one by one; while users can edit the parameters that have been updated.

How to view and edit modified parameters

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until to return the main interface.	
2	If you are not in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting" Modified Parameters", and then press the right function key or the OK button to enter the modified parameter sub menu.	
3	This menu is basically the same as the parameter menu, but it only shows the modified parameters here, and do not need to select the parameter group. Refer to the "parameters" section of the specific operation. To exit this mode, press the left function key.	

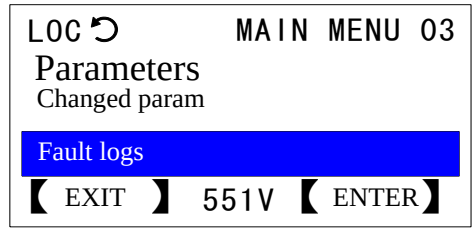
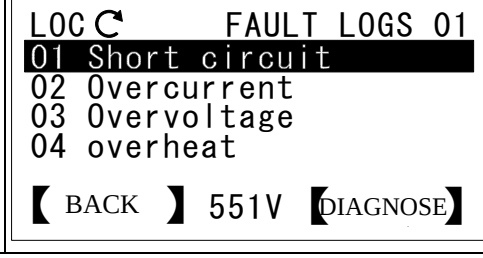
Fault logs

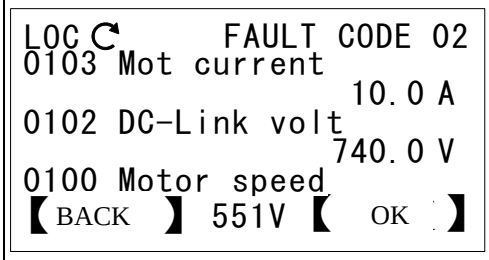
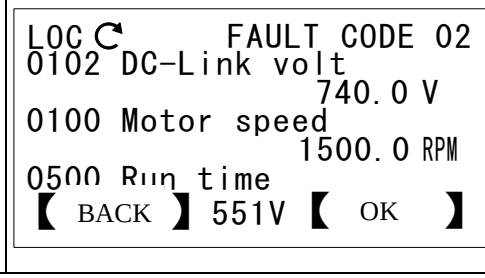
With this option, the user can：

1. View fault log

2. View fault diagnosis information

How to view fault log and fault diagnosis information

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until to return the main interface.	
2	If you are not in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting " Fault Logs", and then press the right function key or the OK button to enter the fault logs sub menu.	
3	**The two digits in the front of each row of the LCD display screen is the fault code. The selected fault serial number displayed on the upper right corner of the LCD screen (the smaller the value is, the closer to the current moment).** Initially, the recent fault arranged in front, the first fault is the most recent happened fault and being selected (highlighted) Using the	

Step	Action	Display
	navigation keys (up and down or so four direction keys) to select the specified fault.	
4	Press the right function key or the OK button to view the fault diagnosis information, **Fault Code is displayed in the upper right corner of the LCD display**. If the diagnostic information is empty, the LCD screen center will display ”No details”, means there is no detailed information about the selected fault.	
5	If the length of the fault diagnosis information exceeds the length of information that the LCD screen can display, use the navigation keys (up and down or so four direction keys) to view the remaining content. To exit this mode, press any of the three function keys, the left and right function keys and the OK button, will do.	

Assistants

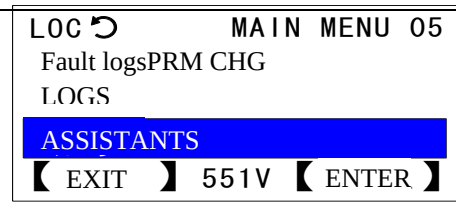
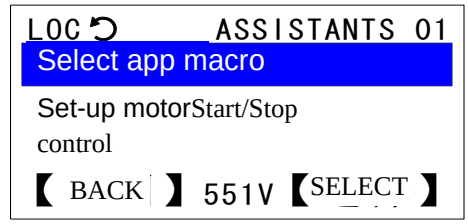
With assistants options, users can：

- Select application macros
- Set-up motor parameters
- Setting up the drive start-stop control parameters

Assistant option contrast in both Chinese and English

Select app macro	选择应用宏
Set-up motor	设置电机参数
Start/Stop control	起停控制命令

How to use an assistant to select an application macro

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until return to the main interface.	
2	If you are in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting " Assistant", and then press the right function key or the OK button to enter the assistant sub menu.	
3	Use the up and down arrow keys to select the "select application macros ", press the right function key or the OK button to enter the parameter edit mode. Refer to the "how to modify the value of the enumeration type parameters" section for specific operation. To exit this mode, press the left function key.	

How to use the assistant to set the motor parameters and the drive start-stop control parameters.

After entering the assistant menu, use the up and down arrow keys to select the corresponding option, press the right function key or the OK button, then the control keyboard will guide the user to set the relevant parameters in turn. After setting all parameters, the control keyboard will pop up with the prompt message "operation completed".

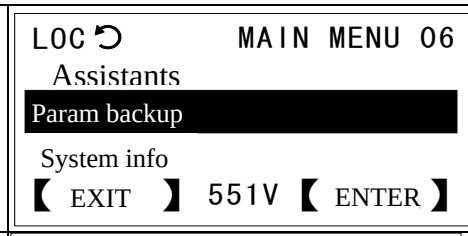
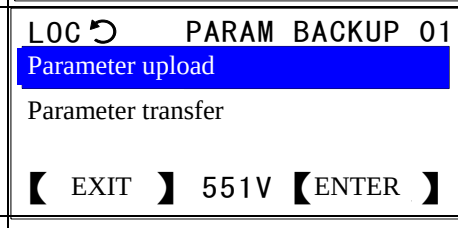
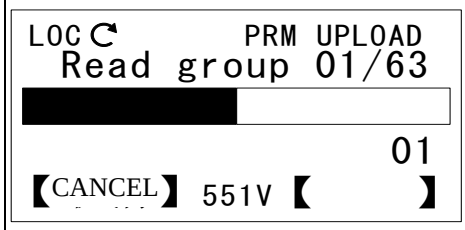
Parameters backup

With this option, the user can:

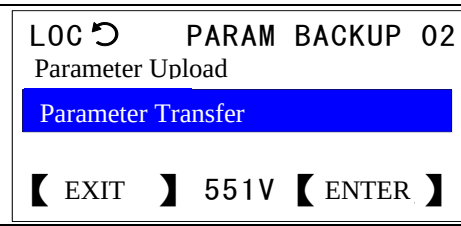
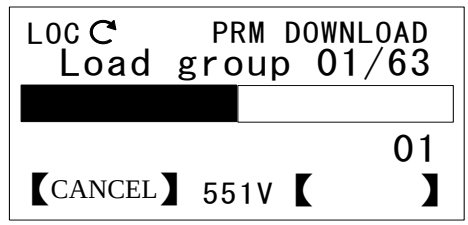
- Upload parameters to local (parameter copy)
- Transfer parameters to drive (parameter download)

How to upload parameters to local (parameter copy)

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until return to the main interface.	

2	If you are in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting " Parameter backup", and then press the right function key or the OK button to enter the parameter backup sub menu.	
3	Use the up and down arrow keys to select the "parameter upload to the local", press the right function key or the OK button to start the parameter copy.	
4	Copy parameters is executed by groups, the first line shows the current executing task，read or save the parameter group, preceding the slash is the parameter group number currently in copy, behind the slash is the total number of the parameter groups. The second progress bar indicates the task execution schedule. The third line shows the prompt message, for example, ”timeout”(overtime), the rightmost number represents the index of the currently reading parameter. After the completion of the copy, the lower right corner will show “finish”.	

How to transfer parameters to drive (parameter download)

Step	Action	Display
1	Omission	
2	Use the up and down arrow keys to select "parameter download to the drive", press the right function key or OK button to start the parameter download.	
3	Download parameters is also executed by groups.Firstly loading the parameter values from the local memory, followed with the CRC check, then compare with the parameter value range, then start to download the current parameter group after CRC check correct and no data overflow. The first line shows the current executing task, i.e. loading, inspection, writing parameter group, the rest similar with parameter copy.	

Instruction on Parameter Backup Hints

Overwrite?: Effective copy data already exists in control keyboard memory, whether to cover?

Timeout!: Overtime. Communication has no respond more than 3 seconds, copy or download interrupted.

NVM empty!: Control keyboard has not been a parameter copy, memory is empty, refused to download.

Data incomplete!**:** Control keyboard memory has copied data, but not complete, refused to download.
Drive unmatch: Drive type and model are inconsistent, refused to download.
Data check error: CRC check error occurred while loading parameter values from the control keyboard storage, download interrupted.
Data overflow!: The previous copy of the parameter value exceeded the parameter range, download interrupted.
Exceed NVM capacity: The address exceeded the capacity of the control keyboard memory when the parameter value is saved, copy interrupted.

SYSTEM INFO

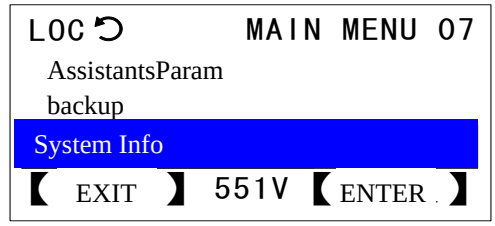
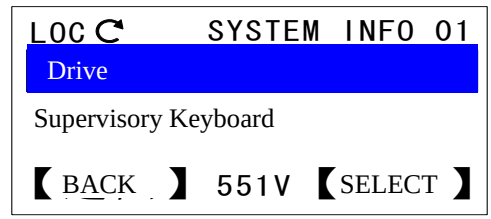
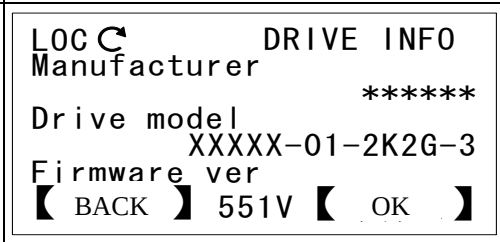
With system information options, users can：

- View the information of the drive manufacturer, model, firmware version, production date and serial number, etc.
- View the firmware version and diagnostic information of the control keyboard.

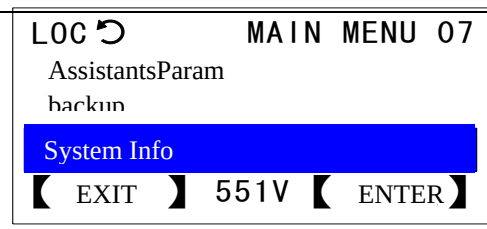
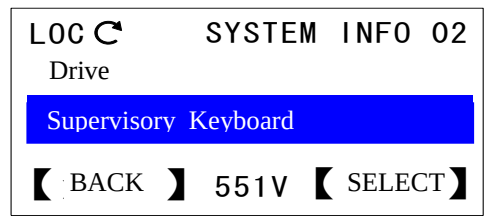
System information in Chinese and English

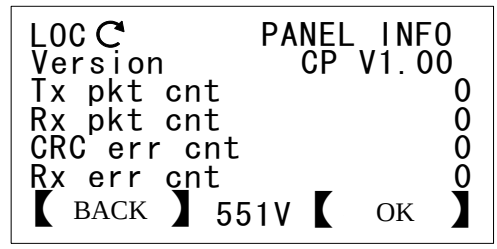
Drive	驱动器
Panel	控制键盘

How to view the information of drive manufacturer, model, firmware version, production date and serial number, etc.

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until return to the main interface.	
2	If you are in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting "System Info", and then press the right function key or the OK button to enter the system information sub menu.	
3	Use the up and down arrow keys to select "drive", press the right function key or the OK button to view the drive manufacturer, model, firmware version, serial number and other information.	
4	Initially, the second line of the LCD screen shows the name of the drive manufacturer; the fourth line shows the product model. Press the navigation keys (up and down or so four direction keys) for scrolling and page turning, browse the remaining content. To exit this mode，press any of the three functions, the left and right function keys and the OK button, will do.	

How to view the firmware version and the diagnostic information of the control keyboard

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until return to the main interface.	
2	If you are in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting "System Info", and then press the right function key or the OK button to enter the system information sub menu.	
3	Use the up and down arrow keys to select "control keyboard", press the right function key or the OK button to view the firmware version and the diagnostic information of the control keyboard.	

4	The first line of the LCD screen shows the firmware version of the control keyboard, the second to the the fourth are the diagnostic information (from top to bottom is the send frame count, the receive frame count, check error count, receive error count). To exit this mode, press any of the three functions, the left and right function keys and the OK button, will do.	

Settings

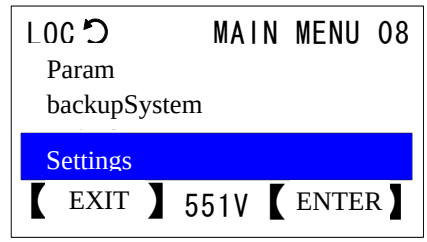
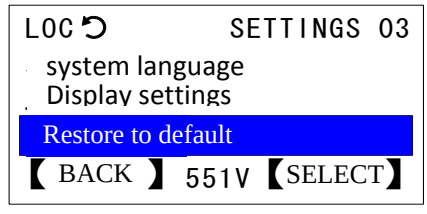
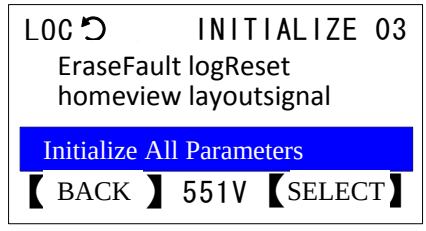
With setting options, users can:

- Select the language of the control keyboard
- Set the LCD display backlight and contrast parameters
- Remove drive fault log
- Restore the default monitoring signal of the main interface
- Restore all parameters of the drive

Setting Options in Chinese and English

System language	系统语言
Display setting	显示设定
Reset to defaults	恢复默认

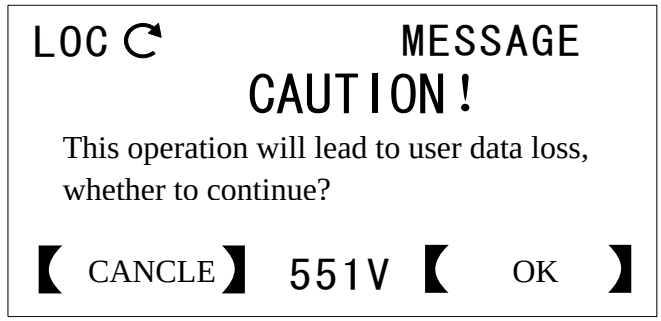
How to clear the drive fault log / restore the default monitoring signal of the main interface / initialize all parameters of the drive

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until return to the main interface.	
2	If you are in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting "Settings", and then press the right function key or the OK button to enter the setting sub menu.	
3	Use the up and down arrow keys to select "restore default", press the right function key or the OK button to enter restore default option.	
4	Use the up and down arrow keys to select one of the options, press the right function key or the OK button will trigger the corresponding request. To exit this mode, press the left function key.	

Restore the default option in Chinese and English

Erase fault logs	清除驱动器故障日志
Reset homeview layout	恢复主界面信号
Reset all parameters	初始化所有参数

☞Note：In order to prevent user misoperation result in data loss, when the user performs this part of operation, the control keyboard will pop up the following tips box. Only the user presses the right function key or the OK button to confirm, will the operation be executed.



Option Menu Mode

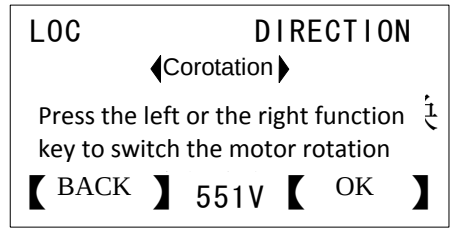
In this mode, the basic operation is the same as the main menu mode. Before reading this part, please read carefully the front chapters.

Local Given

This option is used to edit the local given value. User must press the right function key or the OK button to save, then the change will take effect. If and only when the drive is in a local control mode or a given source selection control keyboard is given, can the users use this option. For specific operation please refer to "how to modify value of the numerical type parameters" section.

Motor Rotation Direction

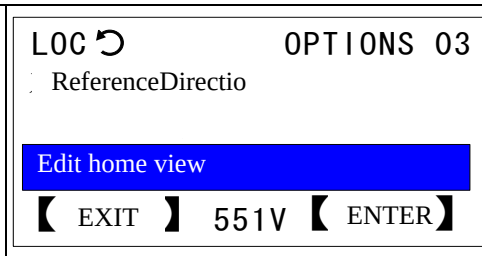
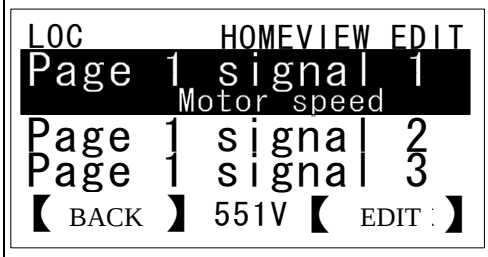
This option is used to switch the rotation direction of the motor. As shown on the right picture, the center of the LCD screen shows the current motor rotation direction (Forward represents Corotation, Reverse represents Reversion) A line of prompt is shown below to tell the user to press the left or the right direction key to switch the direction.



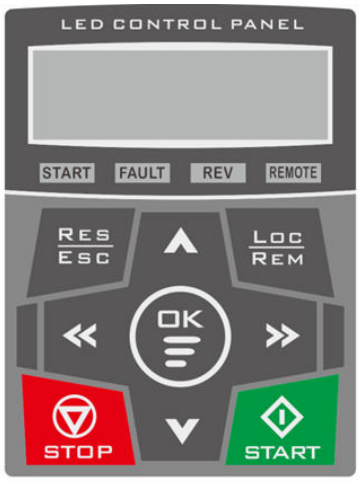
Edit Main Interface

How to select a monitoring signal and view or edit its input source

Step	Action	Display
1	If you are in the options menu, press the left function key repeatedly or hold it until return to the main interface.	

2	If you are in the main interface, press the right function key to enter the main menu, or press the left function key repeatedly until return to the main menu. Use the navigation keys (up and down or so four direction keys) selecting "Edit Main Interface", and then press the right function key or the OK button to enter the edit main interface sub menu.	
3	Initially, the first signal is selected, then the input source of this signal immediately shown below (highlighted). Using the navigation keys to select the corresponding signal to view its input source, If you want to modify the input source, press the right function key or the OK button to enter the parameter edit mode. Refer to the section of "how to modify the value of the numeric pointer type parameters" for specific operation. If user selects the option of “always 0” when edit the input source, the input source of this signal will display “empty, no signal”.	

■ 3. LED Control Keyboard



☞Notes：This section only introduces the LED control keyboard keys and indicator lights instructions and main differences introduction of the basic operation. For more content, please refer to the chapter of LCD control keyboard.

☞Status indicator light

START: Always light indicates the drive started, always extinct indicates the drive stopped.

REV: Always light indicates the motor reverse, always extinct indicates the motor is rotating or stationary.

FAULT: Always light indicates the drive to report failure, always extinct indicates no fault.

REMOTE: Always light indicates the drive is in remote control mode, selecting of control for terminal or communications. always extinct indicates the drive is in local control mode, flashing indicates that the drive is in remote control, with controlled choice of control keyboard.

Operation Instructions

Initially, the control panel is in the main interface. The LED digital tube shows a monitoring signal, such as motor speed 1500.0. ☞**Press the left or right function key to switch the monitoring signal, press these two buttons at the same time can restore to display the first monitoring signal**.

Drive in failure status, the LED digital tube displays the fault code, such as E-01, and all digital tubes synchronously flashing. At this time, ☞**Press RESET key can reset the fault**.

when the drive alarms, the LED screen displays the warning code, such as A-01. Alarm information will pop up once in every 10 seconds, and last for 3 seconds (flashing 3 hypo) then automatically hidden. ☞**Press the up and down or so four direction keys and the OK button to hide the fault or alarm message.**

☞**When the control panel is in the main interface, press the OK button to enter the parameter menu to view or modify the parameter values.** The parameter menu is a three level menu. The first level menu for selecting parameter group, the second menu for selecting parameter index, and the third menu for editing parameter value. Press the upward key to increase the parameter group, the index or the parameter value; press the downward key to decrease them. After edit finished, press the OK button to save the parameter values and return to the previous menu, or you can press the ESC key to give up the edit. If there is no any keystrokes action in 1 minute, the Menu automatically exits.

☞**To view or modify the local given value, press the up or down arrow key in the main interface to enter the local given menu.** At this time, all digital tubes synchronous flashing, press the up or down arrow key again to increase or decrease the local given value. If no keying action in 3 seconds, the menu automatically exit. If need to quickly modify the local given value, press the OK button to enter the parameter menu to modify the local given value.

☞【Key Function Description】

Key	Function
【OK】Confirm key	Enter into the parameter menu and save the parameter values step by step.
【RES/ESC】key	When the screen displays failure code (E-XX), Reset fault. Other cases, exit the menu step by step , Cancel edit.
【Upward】key	Increase the parameter address (group, index), parameter values; Enter local given menu, Increase local given value.
【Downward】key	Reduce the parameter address (group, index), parameter values; Enter local given menu, Reduce local given value.
【Leftward】key	Backward to switch the monitoring signal (main interface), move the cursor left (menu interface).
【Rightward】key	Forward to switch the monitoring signal (main interface), move the cursor right (menu interface).
Loc/REM,STOP,START	For function introduction please refer to the content of the previous LCD button section.

■ 4. Program Function

Control Place

The Loc/Rem button on the control keyboard can switch between the two modes of local and remote.

Local Control

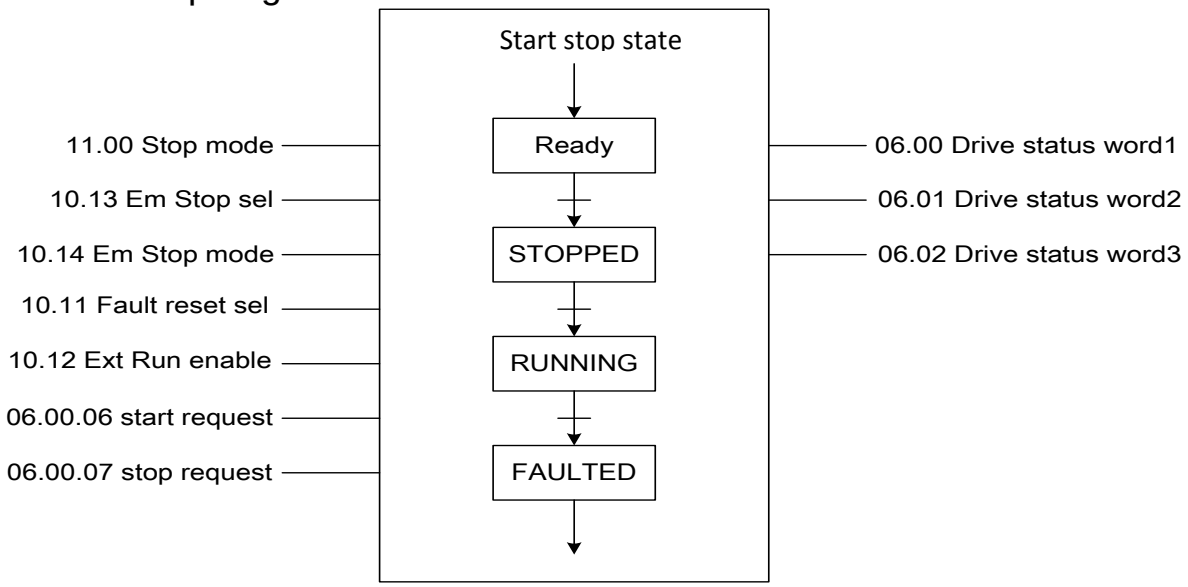
Local control is used for site debugging, maintenance or simple application. At this point the system start-stop control is decided by the START and STOP button of the LCD panel. With the Parameter *16.00 Local lock (local control locking)* to ban the use of control mode switching to local control.

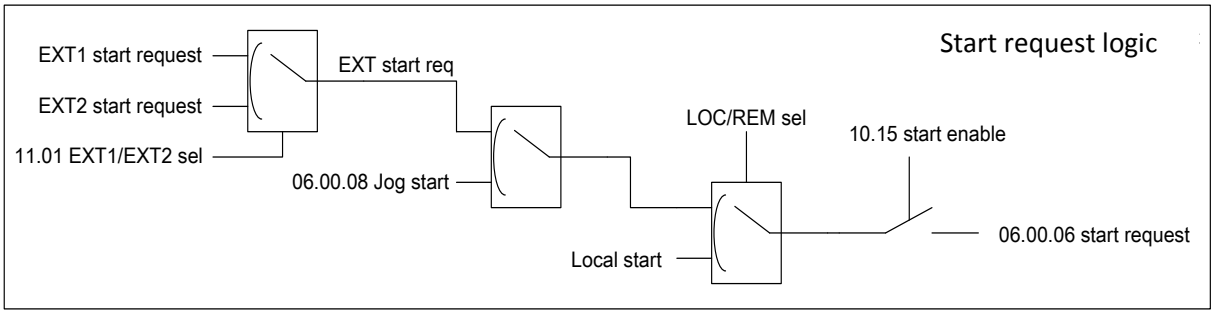
Remote Control

When remote control mode used for practical application, the system start-stop depends on the terminal input or communication instruction, etc.; Speed given depends on analog input, or communication instruction, or process PID control output, Multi segment speed setting, etc. It can provide two remote control place, EXT1 and EXT2. With two kinds of external control place, user can select the control signal (for example, start & stop) and the control mode. According to the user's choice, EXT1 or EXT2 can be activated. User can select EXT1/EXT2 by digital input or fieldbus control.

Start Stop Control

Start Stop Logic





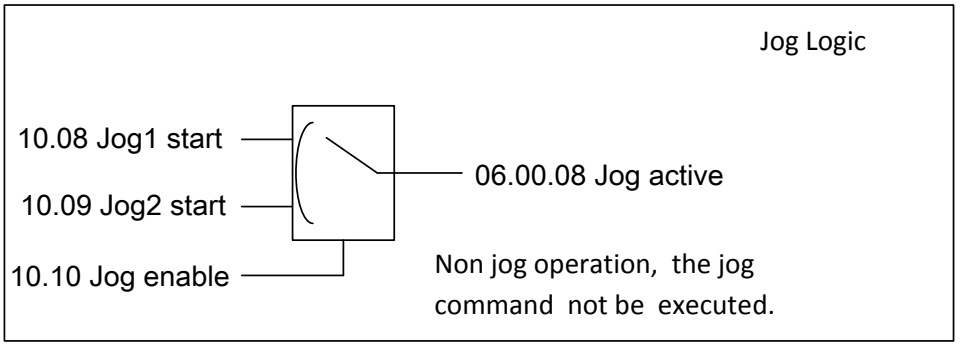
The drive can start from the following four ways: 1) in local control status, Start from LCD panel; 2) in remote control status, Start from the extral control place EXT1; 3) in remote control status, Start from the extral control place EXT2; 4) jog start, as shown in the figure above.

EXT1 start request indicates the start request signal of external control place1, EXT2 start request indicates the start request signal of external control place2. The parameter*11.01 EXT1/EXT2 sel* used for selection of control place, user can set it as fixed value such as EXT1 or EXT2, can also set the terminal

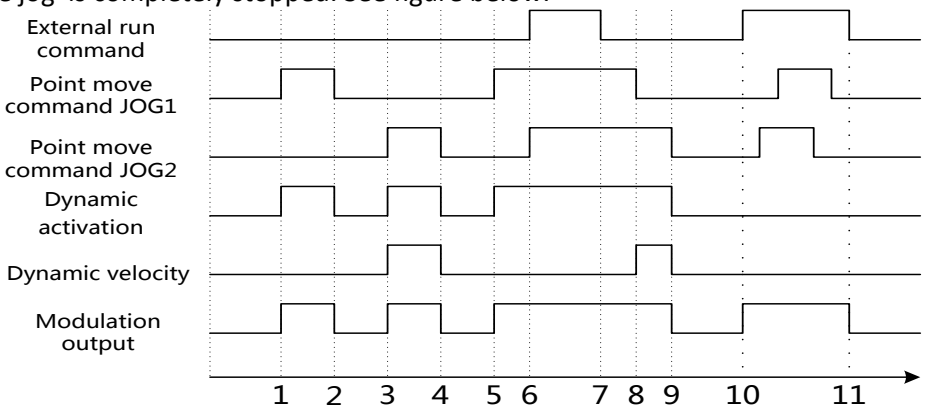
signal from DI1 to DI7 to achieve flexible switching for control place.
With all the start command of starting mode summarized, user can also execute the control by starting the enable master switch. Only when the parameter *10.15 start enable (Start enable)* is effective can start command to be executed, otherwise if the parameter is invalid, the drive will shutdown unconditionally.

Jog Start

Jog start has two signal sources, they are respectively as *10.08 Jog1 start (Jog1 start) and 10.09 Jog2 start (Jog2 start).* When the two jog commands are effective at the same time, the jog command JOG1 is prioritized. User can enable or disable the jog function with the parameter *10.10 Jog enable (Jog enable)* . Note: local control does not provide jog function.



When the jog signal is valid, and if the drive is stopped, then jog the start command signal will also start the drive; When the drive is already in operation, the command will not be executed. When the jog command is activated, the start command signal from external control place will not be executed until the jog is completely stopped. See figure below.



When the drive is in operation, the shutdown signals are as follows: 1) lost start command; 2) receive emergency stop command; 3) lost of operation enable signal; 4) drive failure. When meet with any of the above conditions, the drive will be shut down.

Emergency Shutdown

For emergency shutdown, the shutdown mode depends on the parameters of *10.14 Em stop mode (Em stop mode),* the default is free shutdown. The signal source for emergency shutdown can be selected by the parameters of *10.13 Em stop sel*. The deceleration time for emergency shutdown depends on the parameters of *22.04 Em stop time (emergency shutdown time).*

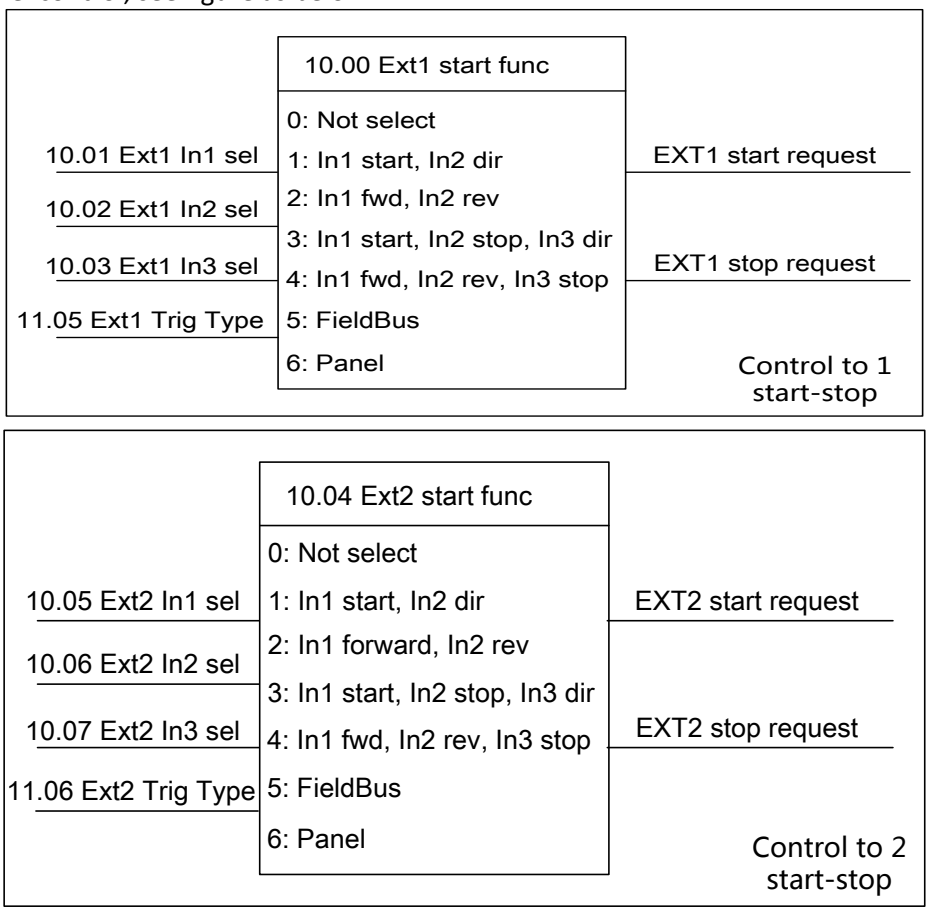
Fault Shutdown

For fault shutdown, mostly they take the free shutdown mode. The below three fault shutdown modes depend on the parameters of *11.00 Stop mode*: 1) Process PID control feedback disconnection; 2) Analog input disconnection; 3) Running time limited.
When the fault is triggered, if the startup command still exists, for non level triggered mode (See parameter of *11.05 Ext1 Trig type*, *11.06 Ext trig type),* even if the fault has been cleared, the system is still banned to start until the start command is removed and then start again.
The fault clearing mode can be achieved by: 1) panel buttons; 2) the rising edge of the specified signal by the parameter of *10.11 Fault reset sel*; 3) auto reset function; 4) power off.

External Control Place

The system provides two completely independent external controls, each of which corresponds to a startup

function, speed/ torque control mode, as well as the speed/ torque given, can be configured flexibly to meet the field applications.
The startup signal combination mode of the two controls depends on the parameters of *10.00 Ext1 start func* and *10.04 Ext2 start func*, which including the two-wire control, three-wire control, communication control, panel control, see figure as below.



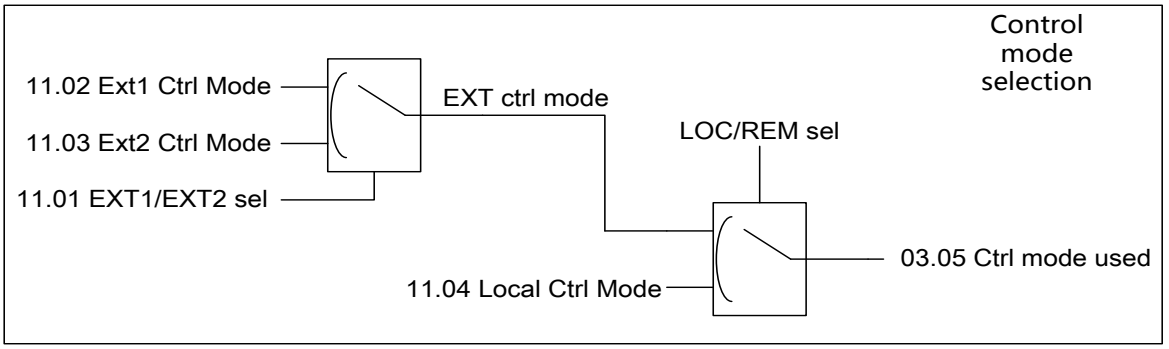
Terminal Two-wire, Three-wire Control

Take the external control 1 as an example, choose 1 or 2 for the parameter of *10.00 Ext1 start func (External control 1 startup function),* the corresponding terminal is two-wire control system; Choose 3 or 4, the corresponding terminal is three-wire control system. The signal source for two-wire or three-wire control is selected by the parameters of *10.01 Ext1 In1 sel*, *10.02 Ext1 In2 sel*, *10.03 Ext1 In3 sel*. User can edit the pointer which will be designated as any one of the digital input terminals, also can be specified for any timer or any signal. The parameter of 11.05 Ext1 Trig Type is used for setting the signal type of In1, In, In3 should be edge signal or level signal. This parameter is for two-wire control only; three-wire control is always the edge trigger.

Speed/Torque Control

For local control, user can only can select the speed or torque control mode. The external control mode can be specified as speed, torque, speed and torque combination, positioning and other modes. The parameter of *11.02 Ext1 Ctrl Mode* is used for the control mode of specified external control 1; the parameter of *11.03 Ext2 Ctrl Mode* is used for the control mode of specified external control 2; the parameter of *11.04 Loc Ctrl Mode* is used for the control mode of local control. The actual implementation of the control mode can be checked by the parameters of *03.05 Ctrl mode used*. The selection and switching for speed torque control mode is shown as below.

Note: for the torque mode, when a request for shutdown is encountered, the control mode will be forced to speed mode.



Speed Given

As the following figure shows, there are two signal sources for the general speed given of the drive which are respectively Speed Given 1 (parameter 21.00 speed ref1 src), Speed given 2 (parameter21.01 speed ref2 src). These two signal sources can execute compositional operation (parameter 21.02 speed ref func), at the same time can be switched (parameter21.03 speed ref sel), and then gain by speed given distribution (parameter 21.04 speed share). When the multi speed terminal is effective, as for the multi speed priority, the speed given will automatically switch to multi speed (parameter 03.02 const speed out). When the jog2 is activated (10.09 JOG2 start), the speed given is modified to jog speed2 (parameter 21.05 Jog2 spd ref); when the jog 1 is activated (10.08 JOG1 start), the speed given is modified to jog speed 1 (parameter 21.06 Jog1 spd ref); When the local control is activated (06.00.15 Local ctrl, the upper left corner of the panel displays “LOC”), the speed given is modified to panel given 1 (parameter 28.02 Panel ref1). When the speed jump is enabled (parameter 25.06 Crit spd sel), the output of the speed given is limited by the jump speed limit (parameter 25.00 to 25.05). The speed given is also subject to the maximum speed limit (parameter 20.00 spd ref max), the minimum speed limit (parameter 20.01 spd ref min), the positive and negative enable limit (parameter 20.02 Pos spd ena, 20.03 Neg spd ena) . The final given of the speed refer to the parameter 03.00 spd ref out.

The general speed given1 and the general speed given 2 can not only choose the conventional signal (Analog, multi speed, high-speed pulse input, bus communication, electric potentiometer, panel given, etc.), but also select any signal by the user-defined edit pointer.

Analog Input Speed Given

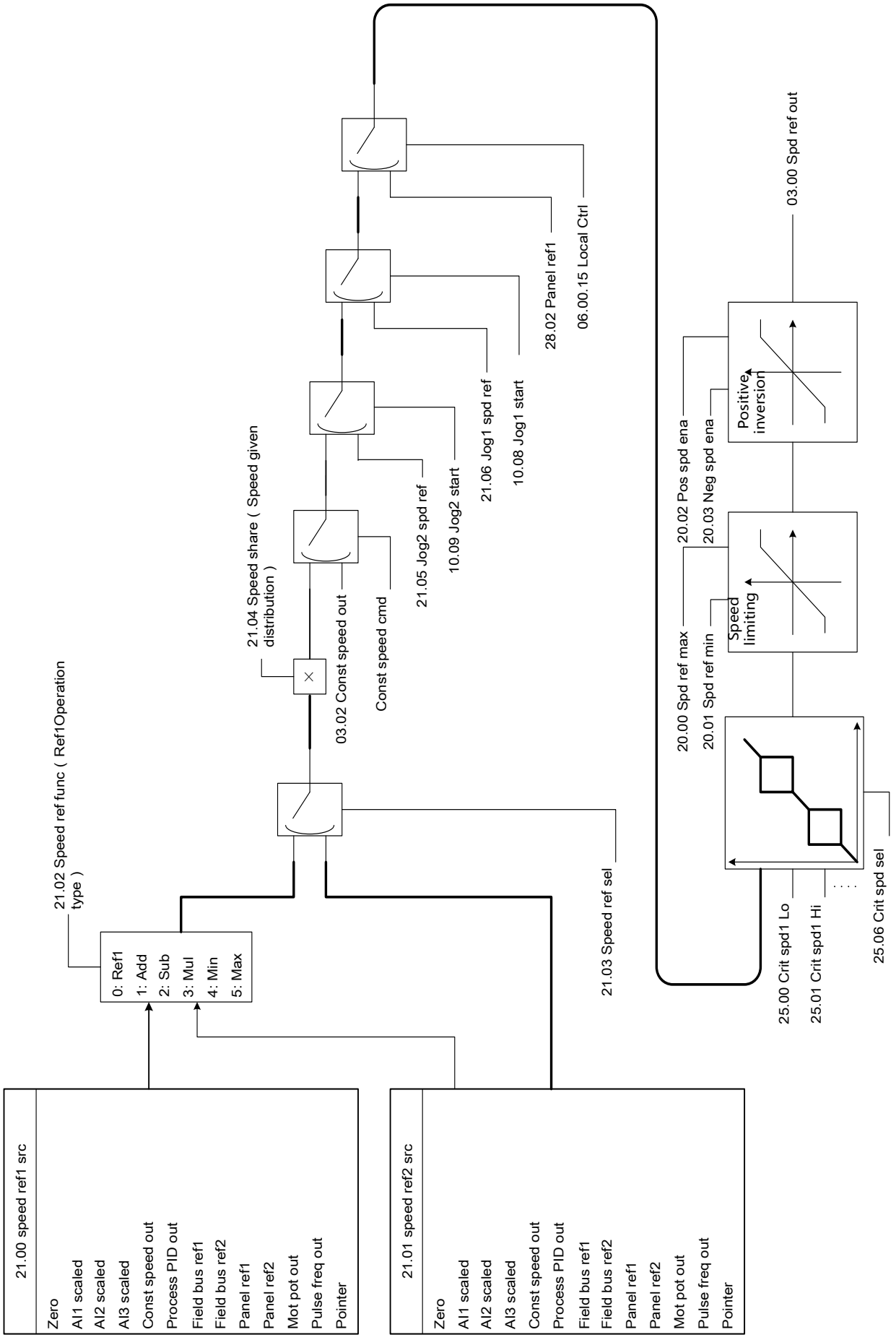
Refer to the content of the Control Interface Section on analog inputs (AI1, AI2, AI3).

High-Speed Pulse Input Speed Given

Refer to the content of the Control Interface Section on high-speed pulse input (DI7).

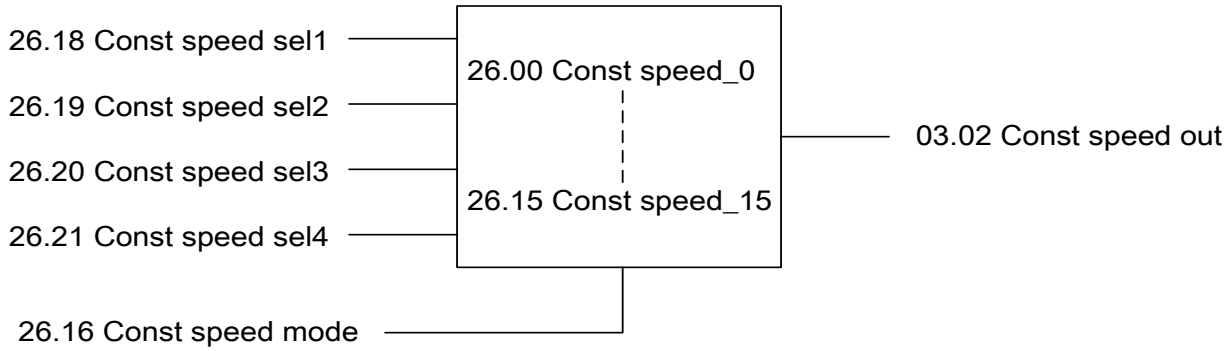
Communication Speed Given

Refer to the Field Bus Chapter.


21.00 speed ref1 src
Zero
AI1 scaled
AI2 scaled
AI3 scaled
Const speed out
Process PID out
Field bus ref1
Field bus ref2
Panel ref1
Panel ref2
Mot pot out
Pulse freq out
Pointer
21.01 speed ref2 src
Zero
AI1 scaled
AI2 scaled
AI3 scaled
Const speed out
Process PID out
Field bus ref1
Field bus ref2
Panel ref1
Panel ref2
Mot pot out
Pulse freq out
Pointer
21.02 Speed ref func (Ref1Operation type)
0: Ref1
1: Add
2: Sub
3: Mul
4: Min
5: Max
21.04 Speed share (Speed given distribution)
03.02 Const speed out
Const speed cmd
21.05 Jog2 spd ref
10.09 Jog2 start
21.06 Jog1 spd ref
10.08 Jog1 start
28.02 Panel ref1
06.00.15 Local Ctrl
21.03 Speed ref sel
20.00 Spd ref max
20.01 Spd ref min
20.02 Pos spd ena
20.03 Neg spd ena
Speed limiting
Positive inversion
03.00 Spd ref out
25.00 Crit spd1 Lo
25.01 Crit spd1 Hi
25.06 Crit spd sel

Multi Speed

Multi speed function supports 4 selection signals (see parameter 26.18 Const speed sel1, 26.19 Const speed sel2, 26.20 Const speed sel3, 26.21 Const speed sel), also can support the combination or separation mode (see parameter 26.16 Const speed mode). The combination mode is consist of 4 selected signals with a combination of 16 options, which are corresponding to 16 segment speed (see parameter 26.00 Const speed_0 to 26.15 Const speed_15), the separation mode is consist of 4 selected signals which corresponding to 5 segment speed (see parameter 26.00 Const speed_0 to 26.15 Const speed_4).



Combination mode（26.16 Const speed mode = 0）：

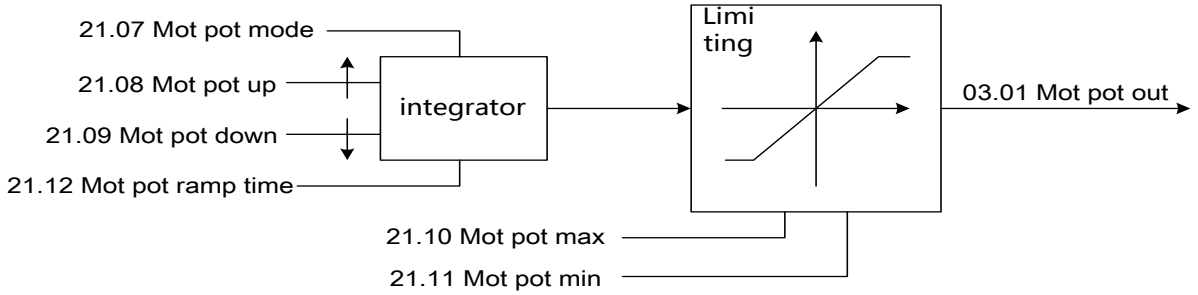
Multi speed choice1 26.18 Const speed sel1	Multi speed choice2 26.19 Const speed sel2	Multi speed choice3 26.20 Const speed sel3	Multi speed choice4 26.21 Const speed sel4	Multi speed output
0	0	0	0	Constvelocity0
1	0	0	0	Constvelocity1
0	1	0	0	Constvelocity2
1	1	0	0	Constvelocity3
0	0	1	0	Constvelocity4
1	0	1	0	Constvelocity5
0	1	1	0	Constvelocity6
1	1	1	0	Constvelocity7
0	0	0	1	Constvelocity8
1	0	0	1	Constvelocity9
0	1	0	1	Constvelocity10
1	1	0	1	Constvelocity11
0	0	1	1	Constvelocity12
1	0	1	1	Constvelocity13
0	1	1	1	Constvelocity14
1	1	1	1	Constvelocity15

Discrete model（26.16 Const speed mode = 1）：

Multi speed choice1 26.18 Const speed sel1	Multi speed choice2 26.19 Const speed sel2	Multi speed choice3 26.20 Const speed sel3	Multi speed choice4 26.21 Const speed sel4	Multi speed output
0	0	0	0	Constvelocity0
1	x	x	x	Constvelocity1
0	1	x	x	Constvelocity2
0	0	1	x	Constvelocity3
0	0	0	1	Constvelocity4

Electric Potentiometer(also named as terminal acceleration and deceleration function)

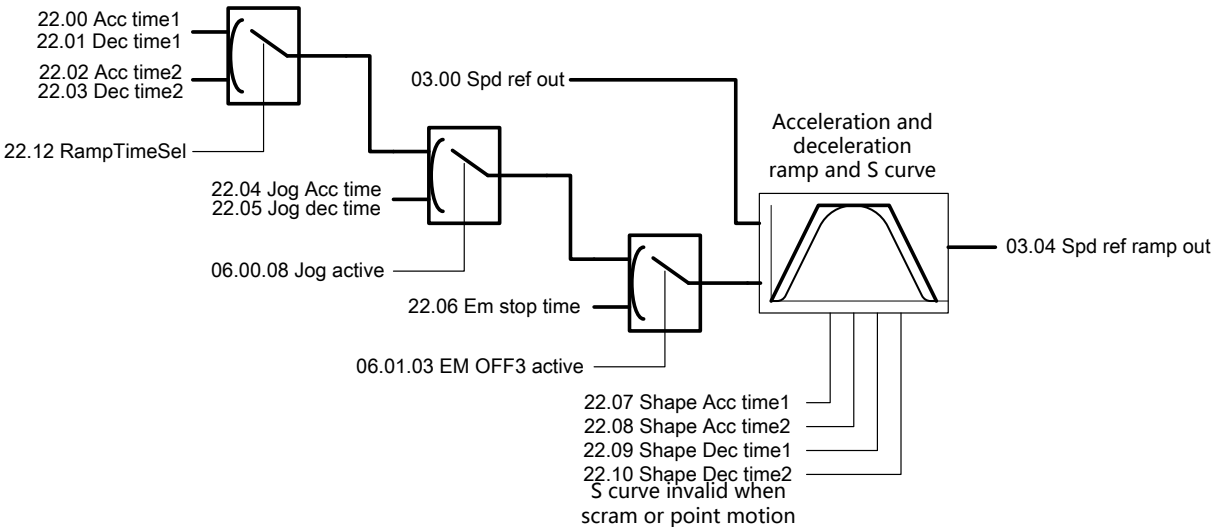
The electric potentiometer is often used for manual speed control, or fine tuning speed. When the input signal increase progressively of the potentiometer (parameter 21.08 Mot pot up) is valid, the integrator accumulate points upwards; When the input signal decrease progressively of the potentiometer (parameter 21.09 Mot pot down) is valid, the integrator accumulate points downward. The integral time of the integrator depends on the parameters of 21.12 Mot pot ramp time, i.e. time required from the minimum value points to the maximum. There are two types of storage mode of the integrator (parameter 21.07 Mot pot mode): 1)Shutdown reset, power off does not save; 2) Shutdown is not cleared, power off saves. The output of the integrator is limited by the amplitude limiting module, the maximum output value depends on the parameters of 21.10 Mot pot max, while the minimum output value depends on the parameters of 21.11 Mot pot min, the actual output of the electric potentiometer is stored in the parameters of 03.01 Mot pot out. When the speed given need to use the electric potentiometer output, please take the first speed given source 21.00 spd ref1 source point to the parameter of 03.01 Mot pot out. When the electric potentiometer output acts as a fine-tuning mode, Please take the second speed given source 21.01 spd ref2 source point to the parameter of 03.01 Mot pot out, then set the synthesis method of the speed given (parameter of 21.02 spd ref1 func) by Add, i.e. speed given 1 and speed given 2 are added as the actual speed given.



Speed Given Ramp Generator

Ramp generator is used for speed control. According to the user set acceleration and deceleration time and the S curve time to produce ramp speed given signal, and take this as speed input for the speed regulator. The drive provides two sets of acceleration and deceleration time for selection, the first set of acceleration and deceleration time is determined by the parameters of 22.00 Acc time1, 22.01 Dec time1; the second set of acceleration and deceleration time is determined by the parameters of 22.02 Acc time2, 22.03 Dec time2. The switching of the two sets of the acceleration and deceleration time is determined by the parameters of 22.12 RampTimeSel. Upon invalid status select the first group, while in valid status select the second set of acceleration and deceleration time. User can always select the first group, or always select the second group, can also specify a signal by the bit pointer, such as digital input terminal DI3. The jog acceleration and deceleration time has a higher priority. When the jog is activated, the actual acceleration and deceleration time is switched into the jog acceleration and deceleration time. See the parameters of 22.04 Jog Acc time, 22.05 Jog dec time. Emergency stop has a higher priority than the ordinary stop and the jog stop, thus when encounter with emergency stop, the actual acceleration and deceleration time will be switched to emergency stop time, refer to parameter of 22.06 EM stoptime.

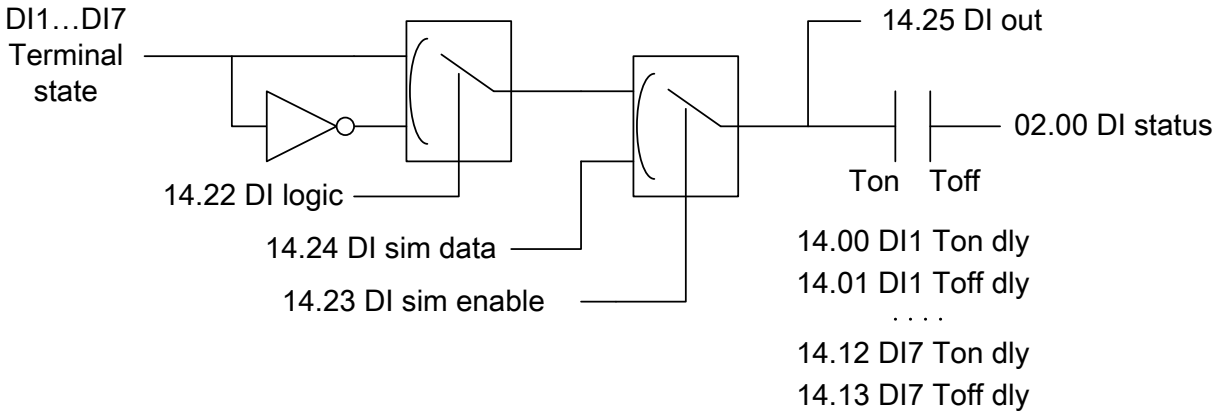
The ramp input is for the output of speed given module 03.00 Spd ref out, Ramp output is 03.04 Spd ref ramp out, used for the input of the speed controller. S Curve is invalid at jog or emergency stop. The setting for S Curve time refers to the parameters of 22.07, 22.08, 22.09, 22.10.


22.00 Acc time1
22.01 Dec time1
22.02 Acc time2
22.03 Dec time2
22.12 RampTimeSel
03.00 Spd ref out
Acceleration and deceleration ramp and S curve
22.04 Jog Acc time
22.05 Jog dec time
06.00.08 Jog active
03.04 Spd ref ramp out
22.06 Em stop time
06.01.03 EM OFF3 active
22.07 Shape Acc time1
22.08 Shape Acc time2
22.09 Shape Dec time1
22.10 Shape Dec time2
S curve invalid when scram or point motion

Control Interface

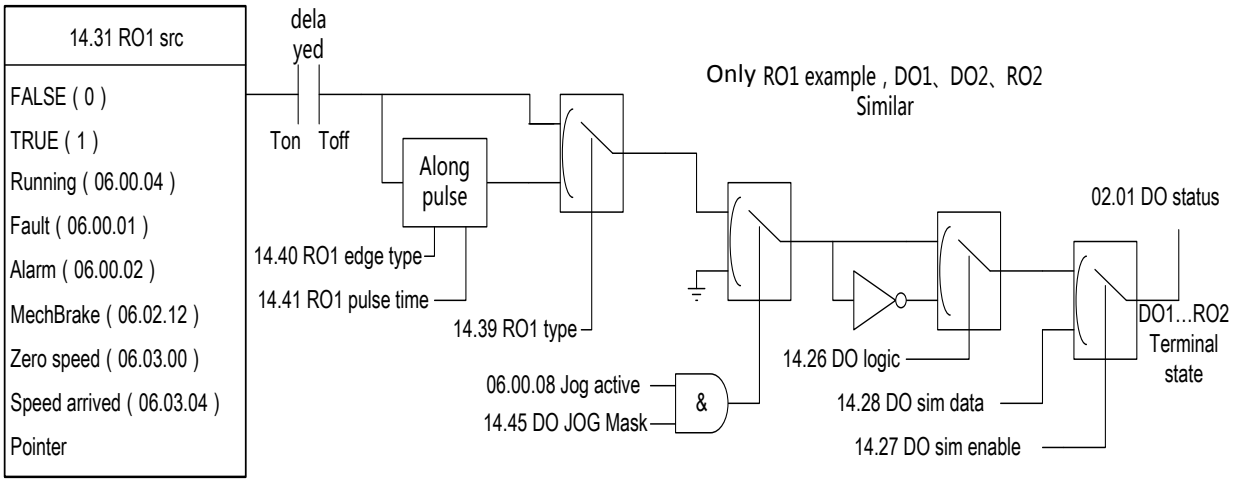
Digital Input Logic（DI1~DI7）

In the digital input module, Each input port supports independent setting of positive and negative logic (parameter14.22 DI logic), independent simulation (parameter of 14.24 DI sim data, parameter of 14.23 DI sim enable), so as to facilitate debugging and diagnosis, meanwhile support the independent filtering time setting (parameter of 14.00 DI1 Ton dly to parameter14.13 DI7 Toff dly). The original state of the digital input is stored in the parameters of 14.25 DI out, while the delayed state stored in 02.00 DI status. User can point to any bit of this parameter by the bit pointer.



Digital Output Logic (DO1, DO2, RO1, RO2)

In digital output module, Each output port can independently set its signal source (parameters of 14.29 DO1 src, 14.30 DO2 src, 14.31 RO1 src, 14.32 RO2 src), independently set the delay time (14.14 DO1 Ton dlyreach14.21 RO2 Toff dly). At the same time can choose the signal level type (parameters of 14.33 DO1 type, 14.36, 14.39, 14.42), which including the level output and the pulse output. When the digital output signal type is pulse output, user can choose the pulse type, such as rising edge, falling edge, rising and falling edge the three kinds of pulse (parameters of 14.34 DO1 edge type, 14.37, 14.40, 14.43). In jog mode, user can shield the output (as in dual frequency wire drawing, the linkage of the drawing machine and the rewinding machine), refer to the parameter of 14.45 DO JOG mask. Each DO and RO output can choose its logic independently (parameter of 14.26 DO logic) and independent simulation (14.27 DO sim enable, 14.28 DO sim data). The real time state of digital output is stored in the parameters of 02.01 DO status, in convenient for facilitating debugging and diagnosis.

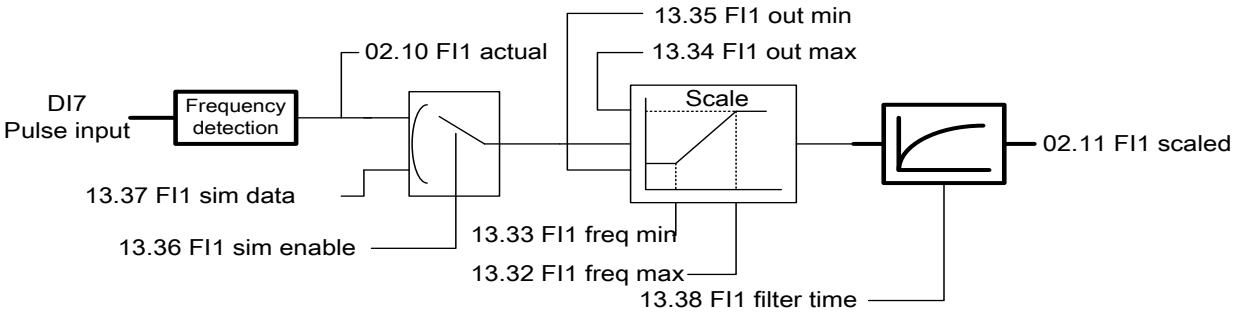


Analog Input (AI1,AI2,AI3)

Analog input is often used for speed given, temperature detection and process PID control. Analog input after A/D conversion, conduct low-pass filtering, filtering time can be set independently (parameter13.09 AI1 filter time, 13.21 AI2 filter time, 13.31 AI3 filter time). The signal type of analog input can be selected as voltage or current type (parameter13.17 AI2 mode, 13.28 AI3 mode, AI1 always for voltage type). Analog input correction is usually done before out of the factory, users do not need to pay attention to it. The actual voltage or current value of the analog input stored in the parameters of 02.02 AI1 actual, 02.04 AI2 actual, 02.06 AI3 actual. Analog input can be simulated (parameters of 13.07 AI1 sim enable, 13.08 AI1 sim data etc). The conversion part of analog refers to the conversion of 0~10V or 0~20mA into actual control such as 0~1500rpm, 0~10000 etc. Refer to the parameters of 13.01 AI1 min, 13.02 Max AI1, 13.05 out max, 13.06 AI1 out min etc. The converted results are stored in the parameters of 02.03 AI1 scaled, 02.05 AI2 scaled, 02.07 AI3 scaled.

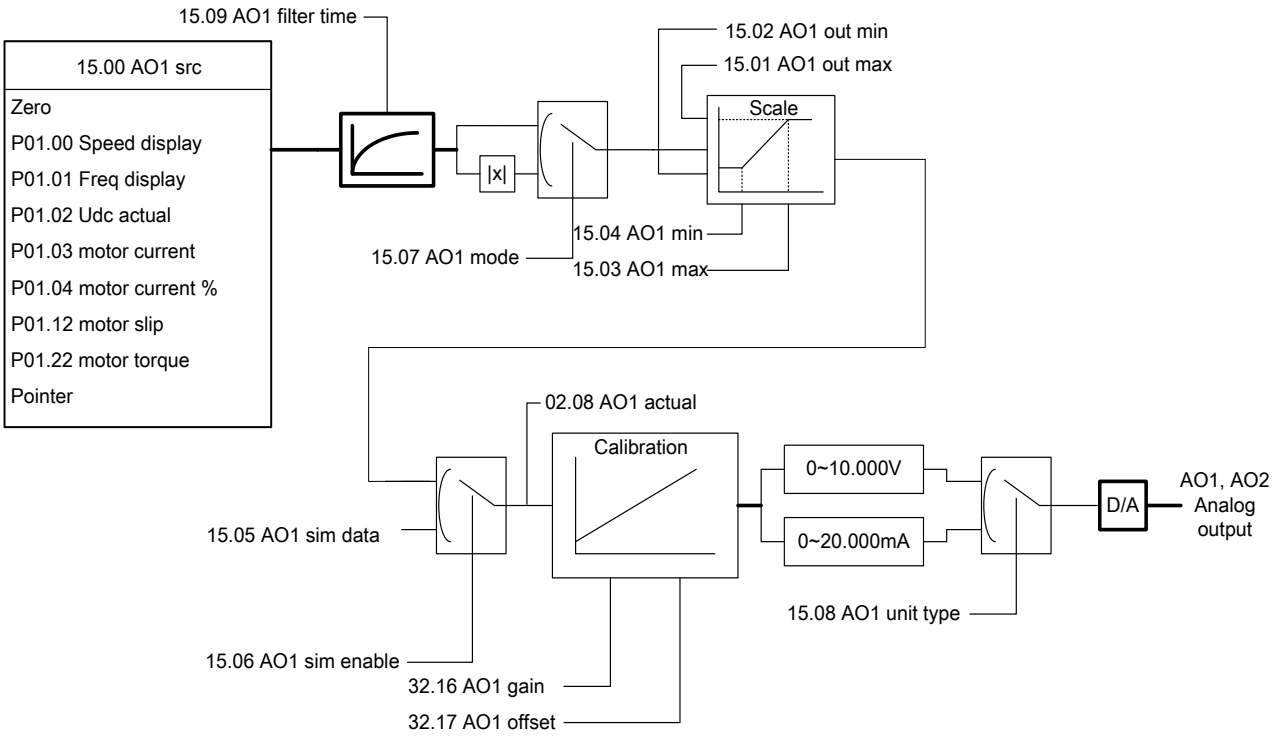
High Speed Pulse Input (DI7)

The high speed pulse input only supports input from DI7 (for micro transfer model is DI6), maximum 60KHz. The actual detected frequency value is stored at the parameter of 2.10 FI1 actual. The conversion principle of the high speed pulse is similar to that of the analog input, parameters of 13.32 FI1 max freq, 13.33 FI1 min freq, 13.34 FI1 out max, 13.35 FI1 out min. The high speed pulse contains a low-pass filter (parameter of 13.38 FI1 filter time), the actual converted value is stored in the parameters of 2.11 FI1 scaled.



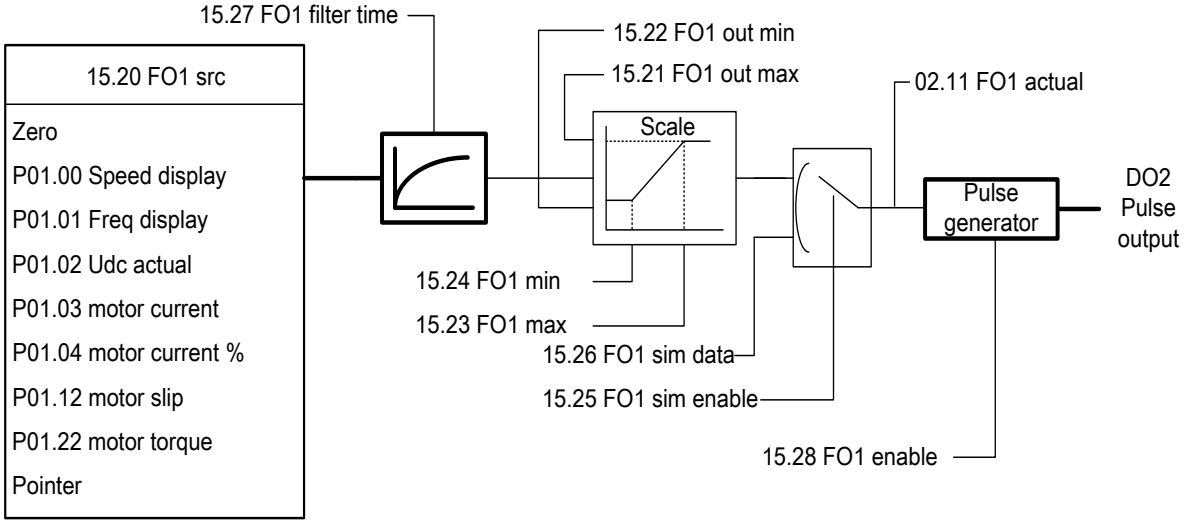
Analog Output(AO1,AO2)

The analog output module can set the output signal source independently (parameters of 15.00 AO1 src, 15.10 AO2 src), can set the filter time independently (parameters of 15.09 AO1 filter time, 15.19 AO2 filter time), can select signed or unsigned output (parameter of 15.07 AO1 mode, 15.17 AO2 mode). The conversion section is used to convert the internal signal quantity into standard 0~10V or 0~20mA, refer to the parameters of 15.03 AO1 max, 15.04 AO1 min, 15.01 AO1 out max, 15.02 AO1 out min). The simulation module is used for debugging or current bias for motor temperature sensor (parameters of 15.06 AO1 sim enable, 15.05 AO1 sim data). The actual analog output voltage or current value is stored in the parameters of 02.08 AO1 actual, 02.09 AO2 actual. Analog output type can choose voltage or current type (parameters of 15.08 AO1 unit type, 15.18 AO2 unit type). The correction of analog quantity is being completed in factory. Users usually do not need to pay attention to.



High Speed Pulse Output (DO2)

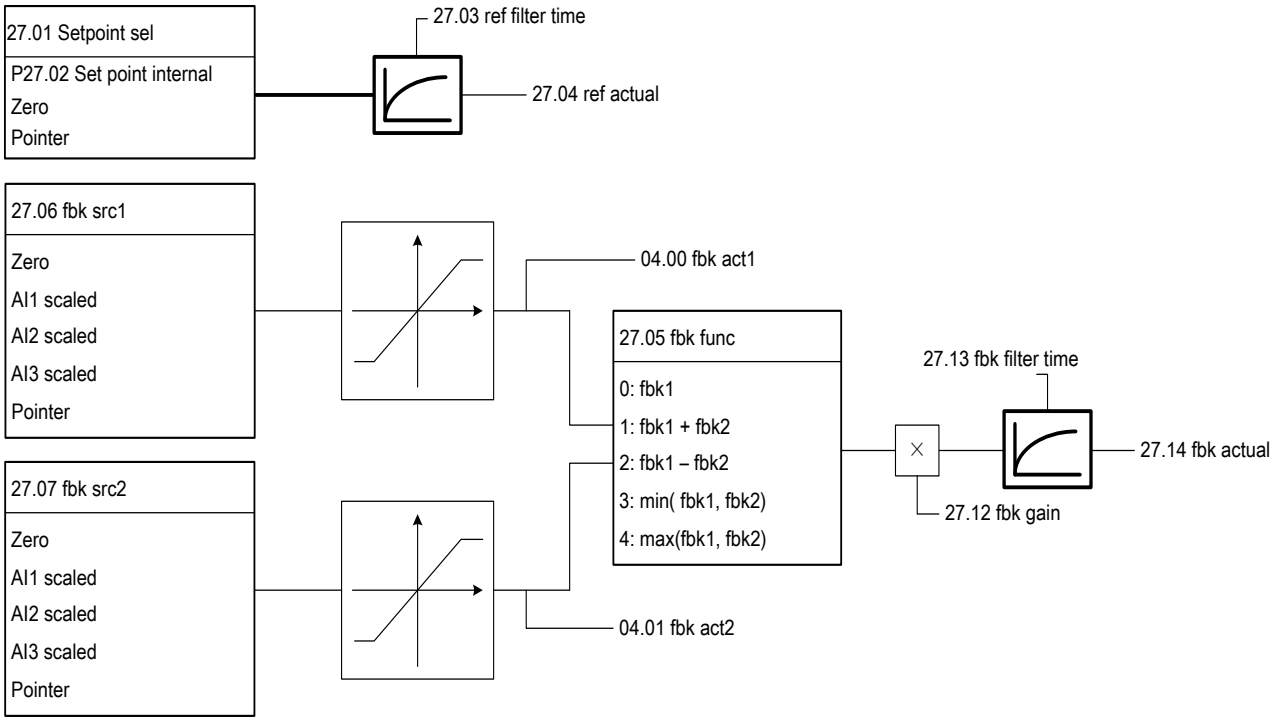
The high speed pulse output only supports DO2. The signal source of the high speed pulse output (parameter of 15.20 FO1 src) after filtering (parameter of 15.27 FO1 filter time) enter into conversion module (parameters of 15.21 FO1 out max, 15.22 FO1 out min, 15.23 FO1 src max, 15.24 FO1 src min). If enable the simulation (15.25 FO1 sim enable), then the output pulse frequency depends on the simulation settings (parameter of 15.26 FO1 sim data). The actual output pulse frequency is stored in the parameters of 02.11 FO1 actual. Note: since DO2 defaults to general digital output, if user needs to use the high-speed pulse output function, then need to enable the pulse generator (parameter of 15.28 FO1 enable).



Process PID Control

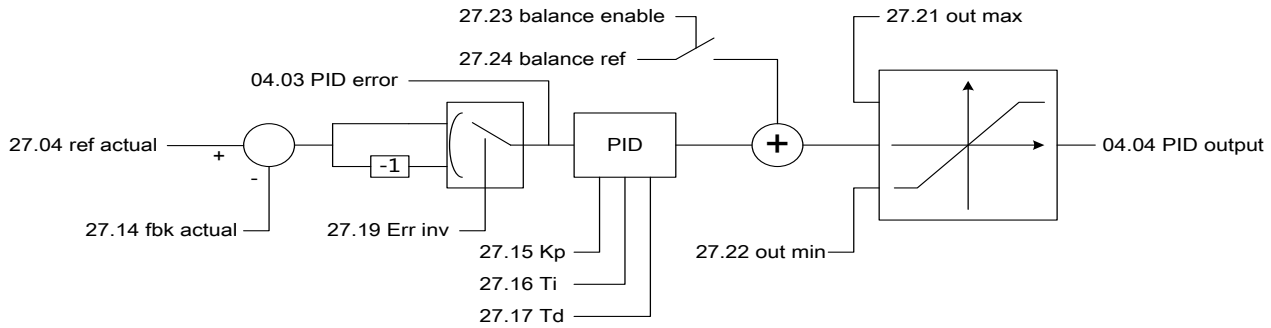
Process PID control is commonly used in position, temperature, flow, pressure and other process control. PID contains several basic links: given, feedback, error amplification, limiting, feedback disconnection detection. PID is given by selection of the parameter 27.01 setpoint sel. The default parameters as 27.02 set point internal (internal PID given). User can customize the parameters as panel given, analog given, communication given etc.. Given filtering time is set up via the parameters of 27.03 ref filter time. The given real time results stored in the parameters of 27.04 ref actual.

The PID feedback supports two signals conducting synthesis, they are respectively as parameters of 27.06 fbk src1 and parameters of 27.07 fbk src2. Users can edit this pointer arbitrarily. The real-time value of the two feedback signals is stored at the parameters of 04.00 fbk act1 and the parameters of 04.01 fbk act2, users can determine whether the external feedback is normal by monitoring this parameter. The feedback synthesis operation is selected by the parameters of 27.05 fbk func which including summation, difference, maximum, minimum value,etc. The feedback gain after the completion of operation (parameters of 27.12 fbk gain) and filter (parameter27.13 fbk filter time) conditioning, the result is stored in the parameters of 27.14 fbk actual.



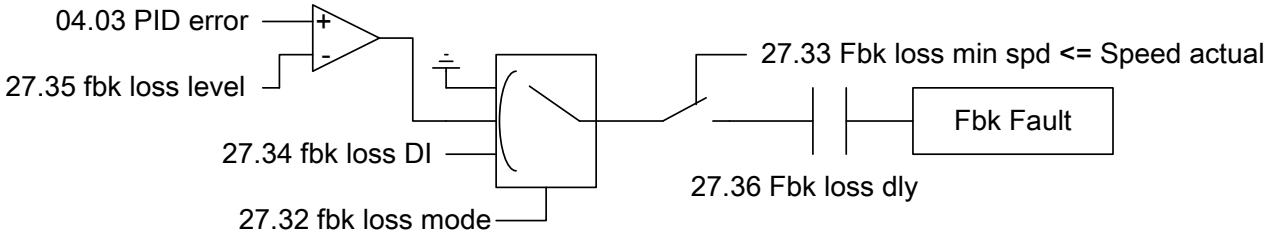
The actual given 27.04 ref actual and the actual feedback 27.14 fbk subtract and get error. If the user need to change the feedback polarity, user can select by the error opposition enable parameters of 27.19 Err inv. The default is feedback represents increase, while output represents decrease. When Error opposition enable, the feedback decrease and output increase. The actual errors stored in the parameters of 04.03 PID error.

The error of PID amplification is the driver PID, which including the proportional gain27.15 Kp, the integration time of 27.16 Ti, the differential time of 27.17 Td. Followed is the balance control, user can manually set the balance given 27.24 balance ref. If the balance enable 27.23 balance enable is activated, the PID output will be superimposed on balance given. The output limiting control of the PID is set by the parameters of 27.21 out max, 27.22 out min. The actual PID output is stored in the parameter of 04.04 PID output.



There are two ways of PID feedback breakage detection (parameter27.32 fbk loss mode), which including

external breakage input (parameter27.34 fbk loss DI) and internal error comparison (parameter27.35 fbk loss level). Feedback breakage only effect when the motor speed is greater than the minimum speed 27.33 fbk loss min spd. When the feedback breakage is detected, the feedback breakage fault will be sent out after the delay of 27.36 fbk loss dly.



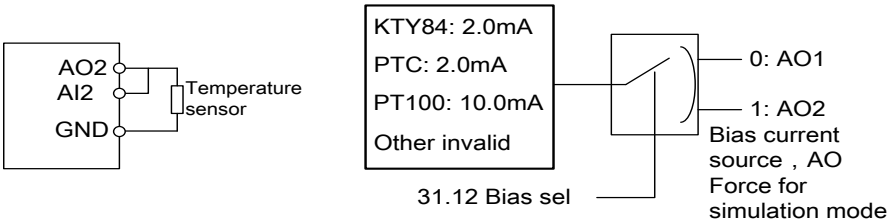
Motor Control

Compared with other brands in the market, the ES Series drive almost don't need to adjust the parameters in motor control. Parameters related to motor control refer to the parameter group *60 Motor control*.
Carrier frequency settings refer to *60.00 carrier freq set*. The default values of different models are different. When the motor line is longer (About 100m or above) , please reduce the carrier frequency to avoid excessive reflection voltage of the motor.
Slip gain refer to *60.01 slip gain*. The speed estimation error of the open-loop control can be improved by adjusting the parameters. Under closed loop control, the parameter can improve the excitation of the motor so as to achieve the best torque output of the motor.
Shock suppression *60.04 Res damp gain*, used for open-loop control only. The smaller the inertia has, the more likely to shock the motor.
Rotation speed tracking refer to the parameter of *60.06 fly restart*, used for open-loop control only. Users can activate to use.
Overvoltage stall refer to the parameters of *60.07 Vdc max control*, default enable. If need to use the brake resistor, please turn off this function.
Undervoltage stall refer to the parameters of *60.08 Vdc min control*, default prohibited.
Auto-tuning refer to the parameters of *63.06 ID run request*. It can support static tuning and rotation tuning.
Configuration of the encoder refers to the parameter group *61 Encoder config*. The status of the encoder option card refers to the parameters of *09.03Encoder type*.

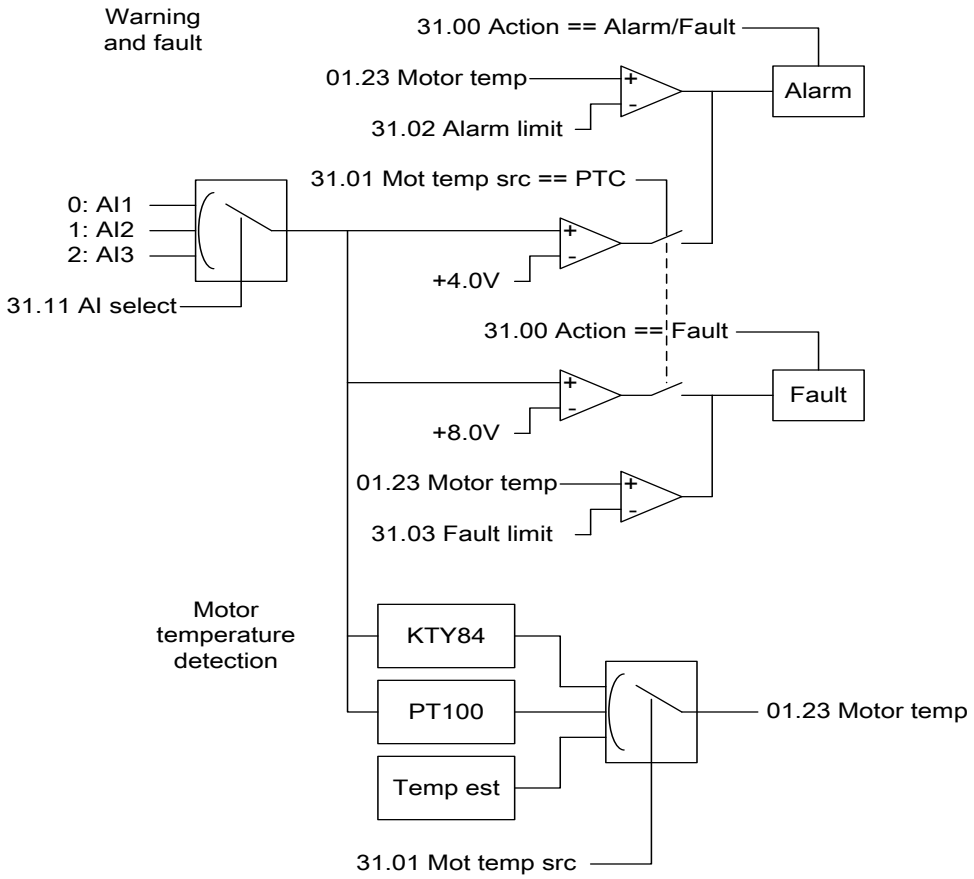
Motor Thermal Protection

The core of the motor thermal protection is to obtain the temperature of the motor, with the ways of sensor detection and thermal model estimation. Three kinds of the supported temperature sensor types are KTY84, PT100, PTC. The wiring of the temperature sensor is shown as below (Taking AI2, AO2 as an example). AO used for the current output bias so that the temperature sensor produces voltage signal, while AI2 used for detecing the voltage signal of the sensor.

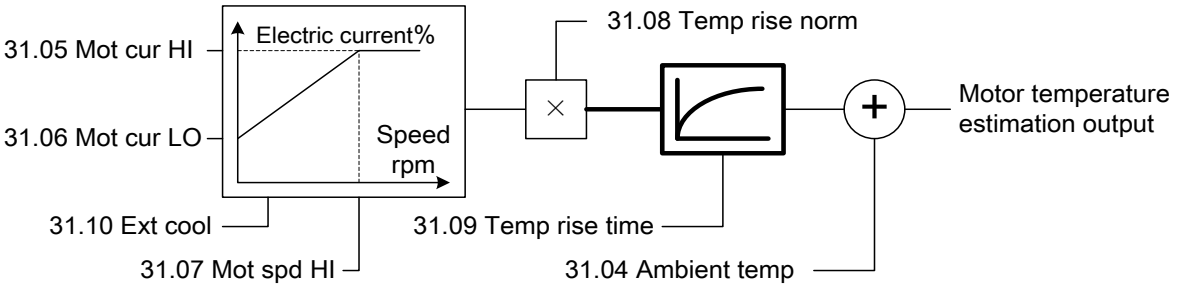
Different types of sensor has different bias current, with the purpose to maintain the appropriate output voltage. The input current of PT100 is 10mA, of PTC and KTY84 is 2mA. The bias current source channel selection is determined by the parameter of 31.12 Bias sel, user can choose either AO1 or AO2. When the type of temperature detection (parameter 31.01 Mot temp src) is not 0 (temperature estimation), the bias current source will be enabled.
The actual temperature can be measured directly for PT100 and KTY84; while for PTC, since it is a nonlinear device, only the overheat protection can be executed, the motor temperature can not be measured accurately. If not connected with the sensor, the default system will use the way of thermal model estimation to obtain the temperature of the motor.



There are three kinds of motor thermal protection action: no action, warning, fault. Refer to the parameter of *31.00 Motor over heat action*. Warning temperature point refer to the parameter of *31.02 Alarm limit*, fault temperature point refer to the parameter of *31.03 Fault limit*. As for the PTC sensor, warning when the voltage is greater than 4.0V, fault trip when greater than 8.0V.



In the absence of the temperature sensor, the motor temperature estimation can also do reliable protection to the motor. The accuracy of the thermal model depends on the user's reasonable setting of the parameters of the motor ambient environment temperature (parameter of 31.04 Ambient temp), the motor rated temperature rise (31.08 temp rise norm), the motor thermal time constant (31.09 temp rise time), the cooling mode (31.10 Ext cool), etc. The parameter 31.05 Mot cur HI is for the corresponding allowed current (the temperature rise is the rated temperature rise) at the speed of 31.07 Mot spd HI, while the parameter of 31.06 Mot cur LO is for the allowed current for zero speed (the temperature rise is the rated temperature rise). When the cooling mode is for external heat dissipation, such as drive motor (parameter of 31.10 Ext cool = External), then the parameter of 31.06 Mot cur LO is invalid.



System Control

There are 5 sets of parameters within the drive system, among them is one group of the current actually used parameter set. Another 4 groups of parameter set are for backup. User can quickly switching the parameter set manually or by the external signal, refer to the parameter of *16.05 Param set sel*.
After debugging the parameters, the parameter can be locked by *16.01 Parameter lock* so as not to be modified by others.

The default fan control is the intelligent temperature control, with the purpose to reduce the unnecessary working hours of the fan and increase the life span of it. User can set the fan as always on or always off via the parameters of *16.14 Fan ctrl mode (Fan control mode) ,* can also be set to run in operation.

Lifting Function

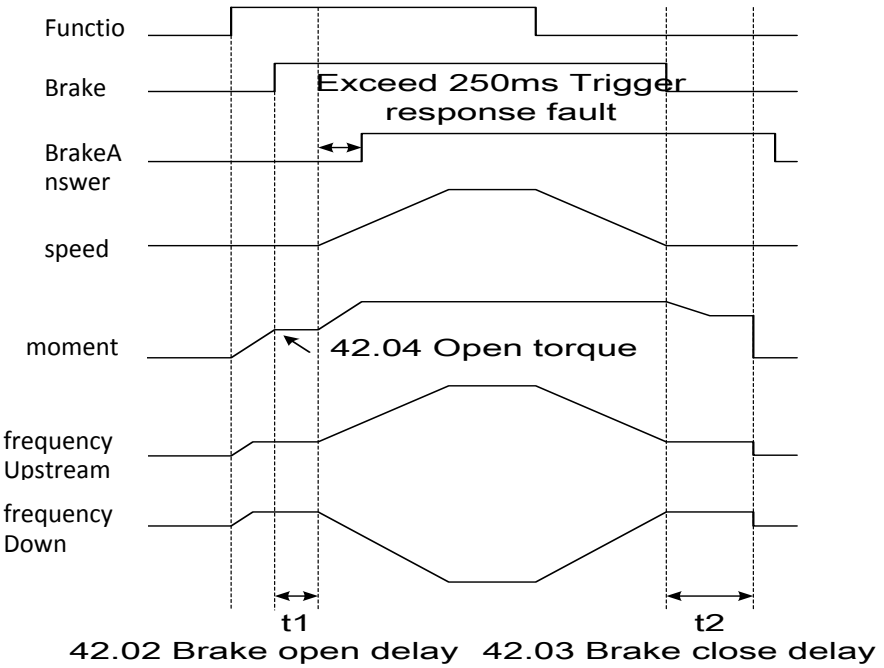
The lifting function is mainly used in the occasions of the tower crane, bridge crane, elevator, etc. The core of the open loop lifting is brakelogic and torque at low speed.

After the lifting is activated (parameter *42.00 crane active*), the output of the brake control will automatically connect to RO1 and shield the over-voltage stall automatically. After receiving the running command, the drive will output torque according to the settings of the brake opening torque (parameter 42.04 Open torque). When the torque reaching the set, the brake request to open, that is RO1 action. Since the brake open needs certain time (parameter of 42.02 Brake open delay), acceleration can be started after the delay.

As receiving the stop command, the drive will start to reduce the speed until the speed reaches zero speed. At this time the brake request closed, i.e. RO1 recovery. Since the brake closure needs time (parameter42.03 Brake close delay), user can turn off the PWM modulation output after the delay.

If the lifting installed with response control, the brake has been opened for 250ms but no response signal received, then user can regard the brake is abnormal and the fault accur.

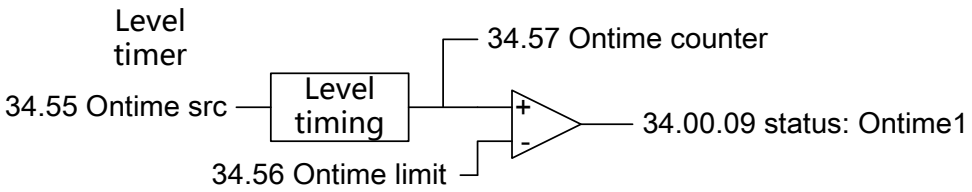
Correctly setting the rated parameters of motor power is the key condition of low speed torqure output.



Editable Logic Function

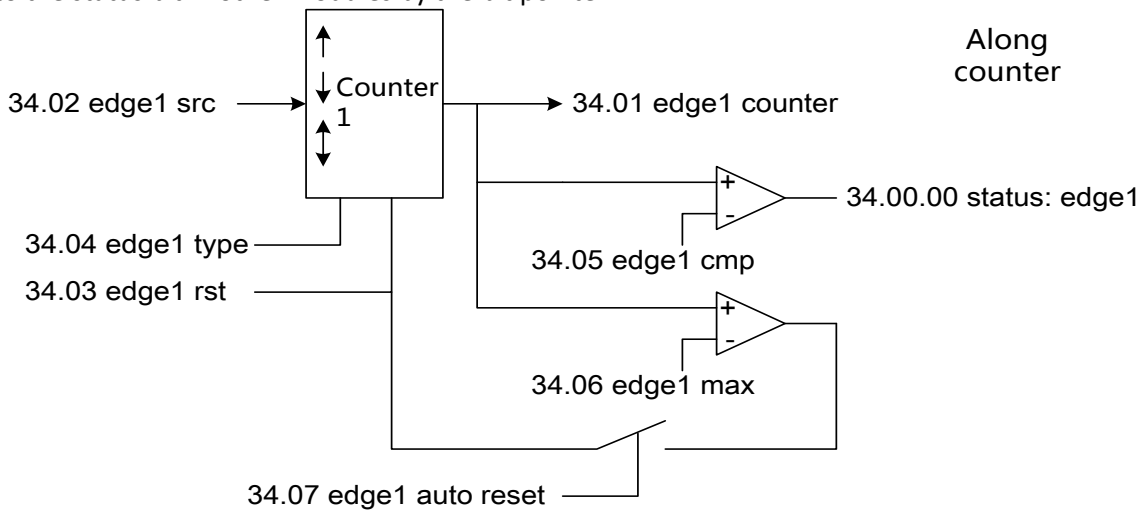
Level Timer

The system provides 3 level timers, here only take the first one as an example. The timing input signal source (parameter *34.55 Ontime src*) can be arbitrarily designated. Timing will start when the signal is valid, reset while the signal is invalid. The timing results are stored in the *34.57 Ontime counter*. The timing comparison is set as a parameter *34.56 Ontime limit*, when the timing result is greater than the setting, the timer output action with the signal stored in the status word *34.00.09 status: Ontime1*.



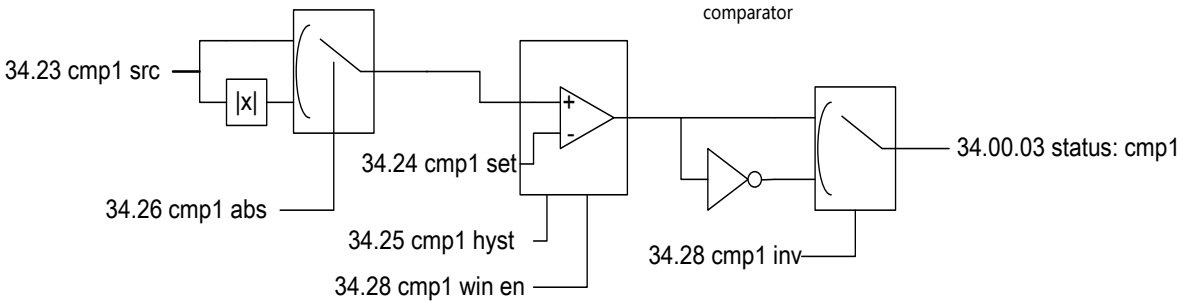
Edge Counter

There are 3 edge counters, here only take the first counter as an example, the rest is similar. User can specify any input signal source (parameter *34.02 edge1 src*) . The counting mode (parameter*34.04 edge1 type*) can be a rising edge, a falling edge or both detection. The reset mode of the counter can choose the external reset signal (*34.03 edge1 rst*), can also achieve the automatic reset by the internal maximum count value (parameters of *34.07 edge1 autoreset*, *34.06 edge1 max*). The real-time counting results of the counter stored in the parameters of *34.01 edge1 counter*. When the counter reach to the set point (parameter *34.05 edge1 cmp*), the status word *34.00.00 status:edge1* is 1, otherwise is 0. User can point to the status bit in other modules by the bit pointer.



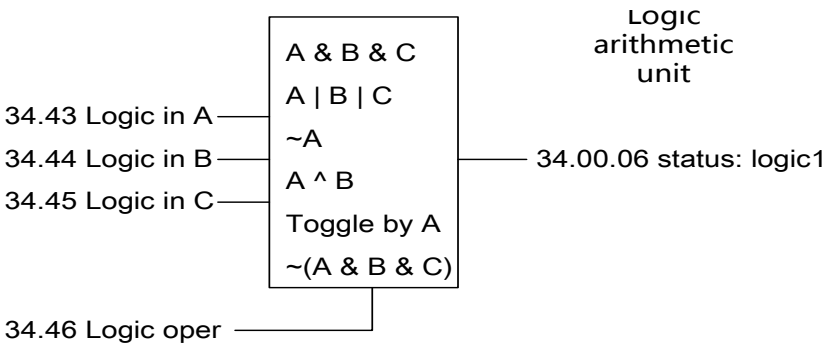
Comparator

The system provides 3 general comparatorus, here only take the comparator1 as an example. The signal source used for comparison (parameter*34.23 cmp1 src*) can be set arbitrarily with the pointer. The comparison method can be an amplitude comparison, can also be a symbolic comparison, refering to the parameter of *34.26 cmp1 abs*. The comparison point is set as the parameterof *34.24 cmp1 set*. The comparison types refer to the parameters of *34.28 cmp1 win enable*. In general comparison status, the hysteresis band of the comparison refer to the parameters of *34.25 cmp1 hyst*; while in the window comparison status, the window width as parameter *34.25 cmp1 hyst*. The logic polarity of comparison can be selected by the parameter of *34.28 cmp1 inv*. The output status of the comparator is stored in the status word *34.00.03 status:cmp1*.



Logic Arithmetic Unit

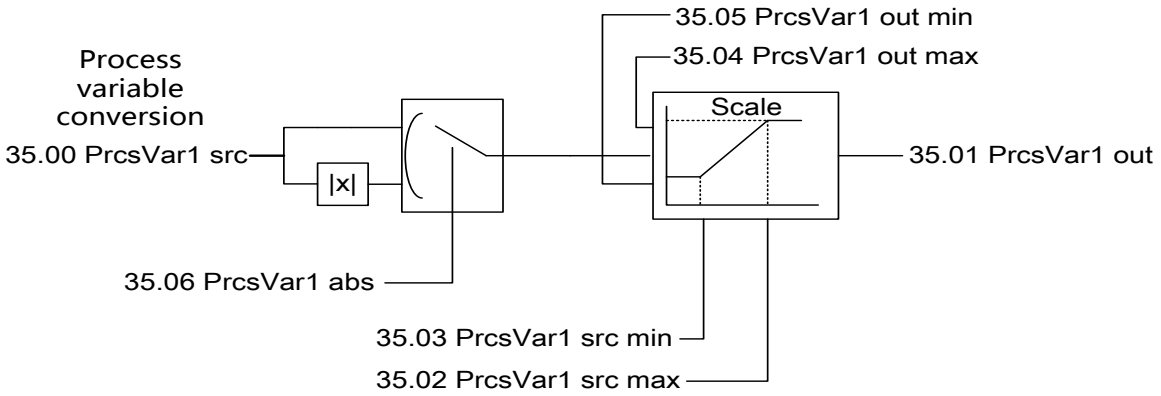
The system provides 3 general logic arithmetic units, here only take the first one as an example. The logic operator contains three input signal sources (parameter 34.43 Logic in A, 34.44 Logic in B, 34.45 Logic in C). There are 6 kinds of logical operator type (parameter34.46 Logic oper), respectively as AND, OR, WRONG, EXCLUSIVE OR, REVERSE, AND NON. The operation output is stored in the status word 34.00.06 status: logic1.



Programmable Arithmetic Function

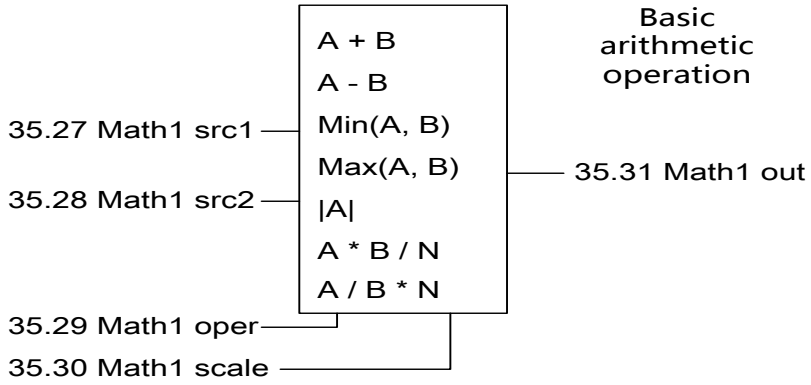
Process Variable Conversion

The process control quantity conversion is used to convert the process quantity into the dimension required by the user. The system provides 3 general process control volume conversions, here only take the first one as an example. The input of the process conversion can be selected by 35.00 PrcsVar1 src. If only convert the size of the amplitude, then enable the absolute value of the operation (parameter 35.06 PrcsVar1 abs). The mapping of the conversion input to output is set by the parameters from 35.02 PrcsVar1 src max to 35.05 PrcsVar1 out min. The conversion results stored in the parameters of 35.01 PrcsVar1 out. The units and the decimal points of the conversion results in the panel display can be specified by the parameter of 35.07 Linear1 y dec and the parameter of 35.08 Linear1 y unit.



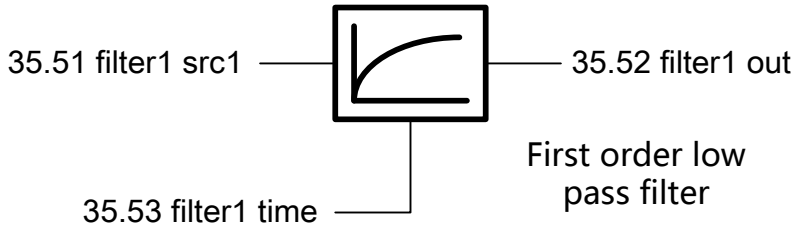
Basic Arithmetic Operation

The system provides 3 general basic arithmetic units, here only take the first one as an example. The arithmetic unit 1 contains a plurality of input signal sources (parameter of 35.27 Math1 src1, 35.28 Math src2). The type of operation (parameter of 35.29 Math1 oper) including the plus, minus, minimum, maximum, absolute value, multiply, devide. For the operation of multiplication and division, user needs to develop a reference value N (parameter35.30 Math1 scale). The output of the operation is stored in the 35.31 Math1 out. Users can point to it by the pointer.



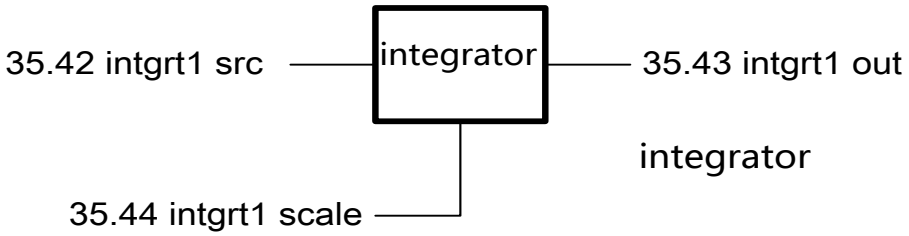
Universal Filter

The system provides 3 general first-order low-pass filter, here only take the first one as an example. The input signal source of the filter can be set via the parameters of 35.51 filter src1. The filtering time of the filter can be set via the parameters of 35.53 filter1 time. The output of the filter is stored in the35.52 filter1 out.



Integrator

The system provides 3 general integrators which are used to count the integral quantity of the displacement, the flow, etc., here only take the first integrator as an example. The input signal source of the integrator can be set by the parameter of 35.42 intgrt1 src, the conversion unit of the integrator set by 35.44 intgrt1 scale. The integrator output parameters stored in the35.43 intgrt1 out.



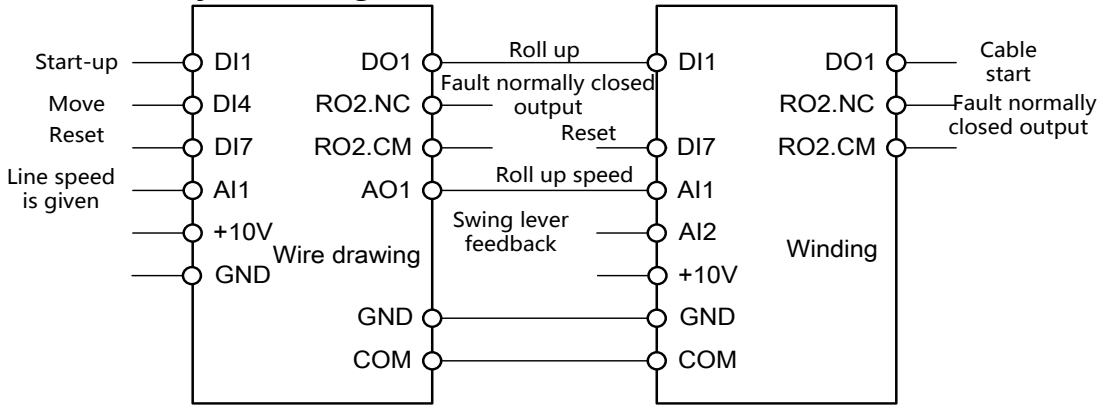
Fault Warning Programming

The drive fault can be classified as maskable and non-maskable. For the fatal fault, the system does not allow the user to shield it. For the peripheral soft faults, user can choose a warning or the fault output.

The maskable faults are: earth leakage fault, input / output phase failure, overheating warning, braking IGBT fault, braking resistance fault.

Typical Industry Application Solutions

1. Rolling and unwinding of the Wiredrawer which Contains the Tension Detection of the Swing Rod



1.1 Parameters need to be set when used for the wire drawing machine:

P10.08 = DI4, Jog signal terminal selection
P22.00 = 40.00s, Acceleration time setting
P22.01 = 4.00s, Deceleration time setting
P63.00 = 7.50kW, Motor rated power setting according to the actual settings; the other motor parameters change automatically
P14.45， DO1 = 0 (Jog linkage enable), DO1 = 1 (Jog linkage being blocked). Please set according to the necessity.

1.2 Parameters need to be set when used for winding

P13.11 = 2V, The minimum input voltage of AI2 is set according to the lower limit value of the swing rod
P20.00 = 2000rpm, The maximum allowable speed is set according to the need
P20.03 = FALSE, Reverse prohibition
P21.01 = P04.04, Speed given Ref2 select PID output
P21.02 = ADD, Speed given as Ref1 + Ref2, Ref1 default as the conversion value of AI1
P22.00 = 0.10s, Acceleration time
P22.01 = 0.10s, Deceleration time
P27.00 = Enable, PID Enable
P60.01 = 0.00, Slip compensation gain
P63.00 = 2.20kW, Motor rated power setting

Adjust the following parameters according to the actual results, normally no need to change.
P27.15, PID Kp, Proportion gain
P27.16, PID Ti, Integration time

2.Lifting Control Solution

The Parameter of 42.00 crane enable = 1, the lifting control function is activated. RO1 automatically connected to the brake control signal P06.02.12.
Set the parameters correctly according to the brake equipment delay as 42.01 brake open delay, 42.02 brake close delay.
Correctly set the speed given, the start-stop mode and the motor power parameters

3. The Control Scheme of the Punching Machine, Stone Bridge Cutting and so on

The difficulty in the application is the overvoltage suppression, please increase the parameter of 32.04 pi_vdc_max_kp to 8000, the parameter of 32.06 pi_vdc_max_f_kp to about 7000, until the overvoltage does not occur at the maximum speed.

4. For the control plans of the other more unlisted equipment and technics please contact with our representative or technical staff to obtain the latest or more detailed application programs and configuration.

■ 5. Drive Parameters list

This chapter describes the parameters of the control program, including the actual signal.

Parameter list Instruction

1: Literal description of the enumeration type parameter (the first column of the table) solidified on LCD control keyboard. When using the MODBUS communication and the field bus edit parameters, please write this parameter with corresponding value (the third column of the table) of the specified text description.

2：The default option list of the pointer type parameters provides only a number of commonly used signal sources. If the user want to select another signal source, select the first option when using the control keyboard to edit the pointer parameters (LCD show as P.xx.yy.zz, xx indicates the group number, yy indicates the index, zz indicates the item (Numeric pointer does not have this part). The specific value is determined by the current value of the parameter, then enter the pointer edit mode to select the parameters corresponding to the specified signal (the bit pointer also need to specify a specific binary bit), or use the MODBUS communications and the fieldbus to make the specified sigal corresponding parameters of the pointer code (refer to the relevant content of the "parameter" section of the "LCD control keyboard" chapter to learn the pointer encoding format) and write into this parameter.

01 Actual values

01Actual values	Basic Signal of the Drive Monitoring	unit
01.00 Motor speed	The unit of the filtered motor speed is rpm. In open loop control, real time rpm for motor estimation; in closed loop control, measured real time speed for motor encoder.	0.1rpm
01.01 Output frequency	Actual value of drive output frequency, Unit isHz.	0.1Hz
01.02 DC bus voltage	Intermediate circuit voltage measurement, Unit is V.	0.1V
01.03 Motor current	Motor current measurement, Unit is A.	0.1A
01.04 Motor current%	Motor current expressed as percentage of motor rated current.	0.1%
01.05 Heat sink temp	Measured radiator temperature.	0.1℃
01.06 Rectifier temp	For F6 models, indicates the measured temperature of radiator where the rectifier bridge is located. Other models are the same as 01.05 (radiator structure of the rectifier and the inverter).	0.1℃
01.07 CPU temperature	Measured temperature of CPU.	0.1℃
01.08 IGBT Tjc	Temperature difference between the IGBT chip and the copper substrate.	0.1℃
01.09 IGBT Tj	IGBT Chip temperature.	0.1℃
01.10 IGBT power loss	IGBT Loss power.	0.001kW
01.11 CPU usage	CPU Actual loading rate.	0.1%
01.12 Motor slip est	Estimated value of the motor slip frequency, Unit is Hz.	0.01Hz
01.13 Motor flux est	The estimated value of the motor flux, relative o the rated flux, Unit is %.	0.1%

01Actual values	**Basic Signal of the Drive Monitoring**	**unit**
01.14 Encoder counter	Cumulative value of the encoder pulse counter.	1
01.15 Pulse counter	Pulse given count statistics value for position control.	1
01.16 Z mark latch	Counter value of the encoder Z pulse counter.	1
01.17 Position ref raw	The original value of the pulse given when the position is controlled.	1
01.18 Actual position	Actual position value used for position control.	1
01.19 PLL freq	For power grid energy feedback, it indicates the actual measured value of the grid frequency For synchronous motor speed tracking, it indicates the actual measured grid frequency value of the back EMF	0.1Hz
01.20 PLL volt	For power grid energy feedback, it indicates the actual measured value of the voltage For synchronous motor speed tracking, it indicates the actual measured voltage value of the back EMF	0.1Vrms
01.21 Output voltage	Actual output voltage value of the drive.	0.1Vrms
01.22 Motor torque	Motor relative rated torque expressed in percentage	0.1%
01.23Motor temperature	Motor temperature value	0.1℃
01.24 Encoder speed	Actual motor speed measured by the encoder	0.1rpm
01.25 Udc ripple	Peak value of the bus voltage ripple, the capacity of the DC bus capacitor drops or the unbalance of the grid, ripple peak value increases. Usually at full load, not exceeding 80V	0.1V
01.26 Spd ref1 gain	Gain of the speed given1 used only in the PID mode with feed-forward. Q12 format.	1
01.27 Power factor	Real time motor power factor	0.001
01.28 Output power	Real time motor active power	0.1kW
01.29 Temp slew rate	Indicates the rate of temperature rise	0.1℃
01.30 Modulation depth	Indicating the modulation depth	0.1%
01.31 LOS cnt	Indicates the number of LOS anomalies of the rotary transformer.	1
01.32 DOS cnt	Indicates the number of DOS anomalies of the rotary transformer.	1
01.33 LOT cnt	Indicates the number of LOT anomalies of the rotary transformer.	1
01.34 PM elect angle err	Indicating the deviation value of the electrical angle and the estimated electrical angle measured by the encoder when the synchronous motor is in closed loop control.	0.1deg
01.35 Ambient temperature	Indicates the intake air temperature of the drive's main air duct. Only some F5 and above models support.	0.1deg

02 I/O Values

02 I/O values	Input and output signals	Unit
02.00 DI status	From the right to the left are the status of the digital input DI1, DI2, ……, DI7. For instance: 0000001=DI1 is 1, DI2…DI7 is 0. *For the meaning of 0 and 1, refer to the parameters of 14.22 DI logic (DI Input logic).*	-
02.01 DO status	From the right to the left are the status of the digital output DO1, DO2 and the relay output RO1, RO2 . For instance: 0101 =DO1synizesis, DO2 Disconnection, RO1 Already electrified, RO2 Power off. *For the meaning of* synizesis *and disconnection, refer to the parameters of 14.26 DO logic (DO Output logic).*	-
02.02 AI1 actual	The actual value of the analog input AI1. Unit is V.	0.001V
02.03 AI1 scaled	The conversion value of the analog input AI1. *Refer to the parameters 13.05 AI1 max scale (AI1 conversion maximum)* and *13.06 AI1 min scale (AI1 conversion minimum)*	-
02.04 AI2 actual	The actual value of the analog input AI2. Unit is V or mA. Set by the parameter of *13.17 AI2 input type (AI2 Input type).*	0.001V or 0.001mA
02.05 AI2 scaled	The conversion value of the analog input AI2. *Refer to the parameters 13.15 AI2 max scale (AI2 conversion maximum)* and *13.16 AI2 min scale (AI2 conversion minimum)*	-
02.06 AI3 actual	The actual value of the analog input AI3. Unit isV or mA. Set by the of parameter *13.28 AI3 input type (AI3 Input type).*	0.001V or 0.001mA
02.07 AI3 scaled	The conversion value of the analog input AI3. *Refer to the parameters 13.26 AI3 max scale (AI3 conversion maximum)* and *13.27 AI3 min scale (AI3 conversion minimum)*	-
02.08 AO1 actual	The actual value of the analog output AO1. Unit is V or mA. Set by the parameter *15.08 AO1 output type (AO1 Output type).*	0.001V or 0.001mA
02.09 AO2 actual	The actual value of the analog output AO2. Unit is V or mA. Set by the parameter *15.18 AO2 output type (AO2 Output type).*	0.001Vor0.001mA
02.10 Freq in actual	The actual frequency of DI7 high speed pulse input.	1Hz
02.11Freq in scaled	The conversion value of DI7 high speed pulse input.	-
02.12Freq out actual	The actual output frequency of DO2 after enabling the DO2 frequency output function.	1Hz
02.13 Control panel ref1	Given1 of the control keyboard.	1rpm
02.14 Control panel ref2	Given2 of the control keyboard.	0.1%
02.15 Fieldbus ref1	Given value1 of the field bus.	1rpm
02.16 Fieldbus ref2	Given value2 of the field bus.	0.1%
02.17 Speed ffwd	Speed feedforward given value of the pulse train control.	1 rpm

03 Control Values

03 Control values	Speed control, torque control and other values	Unit
03.00 Speed ref output	The output value of speed given module.	1rpm
03.01 Motor potent out	The speed given value of the digital potentiometer, can be achieved by the terminal for the addition and substraction of the speed given.	1rpm
03.02 Const speed out	The output given value for the multi segment speed function module.	1rpm
03.03 Speed ref unramp	Use the speed given value before the ramp and the forming speed.	1rpm
03.04 Speed ref ramped	Ramp and forming speed given.	1rpm
03.05 Control mode used	Actually implemented control mode.	-
03.06 Torque ref unramp	The value of the torque given before the ramp input is the percentage of the relative maximum torque.	0.1%
03.07 Torque ref ramped	Ramp torque given value, As percentage.	0.1%

04 App values

04 App values	Process and Counter Values	Unit
04.00 Process act1	Process feedback1 of the process PID controller.	-
04.01 Process act2	Process feedback2 of the process PID controller.	-
04.02 Process act	Final process feedback for process feedback selection and modification.	-
04.03 Process PID err	Process PID deviation value, that is, the difference value between the PID set point and the feedback.	-
04.04 Process PID out	Output of the process PID controller.	-
04.05 Line spd act	Actual value of the winding control line speed.	0.1m/min
04.06 Trq out Nm	Torque control volume of the winding control. Unit is Nm.	0.1Nm
04.07 Trq out percent	The torque control quantity of the winding control. Unit is %.	0.1%
04.08 Tense ref	Tension given value of the winding control.	0.1N
04.09 Tense ref taped	Tension given value of the corrected tension taper.	0.1N
04.10 Roll dia est	Roller diameter estimated value of the winding control.	1mm
04.11 Pulse counter	The external circles of signal count value used for measuring the roller diameter .	1

05 Timer & counter

05 Timer & counter	Value of the timer and counter	Unit
05.00 Run time: sec	Less than one hour at current running time, the parameter will return to zero automatically when accumulated to 3600.	1s
05.01 Run time: hour	One or more than one hour at current running time. When the parameter of 05.00 accumulated to 3600, it will be incremented by 1.	1h
05.02 Power on time: s	Less than one hour at current power on time. This parameter will return to zero automatically when accumulated to 3600.	1s
05.03 Power on time: h	One or more than one hour at current power on time, when the parameters of 05.02 accumulated to 3600, it will be incremented by 1.	1h
05.04 Total run time: s	Less than one hour for the cumulative running time, this parameter will return to zero automatically when accumulated to 3600.	1s
05.05 Total run time: h	One or more than one hour for the cumulative running time, when the parameters of 05.04 accumulated to 3600, it will be incremented by1.	1h
05.06 Total power on: s	Less than one hour for the cumulative power on time, this parameter will return to zero automatically when accumulated to 3600.	1s
05.07 Total power on: h	One or more than one hour for the cumulative power on time, when parameters of 05.06 accumulated to 3600, it will be incremented by 1.	1h
05.08 Fan on time: s	Less than one hour for the cumulative fan running time, this parameter will return to zero automatically when accumulated to 3600.	1s
05.09 Fan on time: h	One or more than one hour for the cumulative fan running time, when the parameters of 05.08 accumulated to 3600, it will be incremented by1.	1h
05.10 EEP ROM wr tick	Less than one thousand times for the total number of writing the EEPROM memory. This parameter will return to zero automatically when accumulated to 1000.	-
05.11 EEP ROM wr tick k	Reaching or exceeding one thousand times for the total number of writing the EEPROM memory. When the parameters of 05.10 accumulated to 1000, it will be incremented by 1.	-
05.12 Max udc	The highest recorded value of the bus voltage.	0.1V
05.13 Max Imag	The highest recorded value of the output current.	0.1A
05.14 Max Tj	The highest recorded value of the IGBT chip temperature.	0.1℃
05.15 Max T_heat sink	The highest recorded value of the radiator temperature.	0.1℃
05.16 Max T_cpu	The highest recorded value of the CPU temperature.	0.1℃

05 Timer & counter	Value of the timer and counter	Unit
05.17 IGBT usage hour	IGBT equivalent use time.	1h
05.18 IGBT usage sec	IGBT equivalent use time.	1s
05.19 P_Mot_kWh	Electric power of the built-in electric energy meter, the kWh part.	0.1 kWh
05.20 P_Mot_MWh	Electric power of the built-in electric energy meter, the MWh part.	1 MWh
05.21 P_Reg_kWh	Power generation of the built-in electric energy meter, the kWh part.	0.1 kWh
05.22 P_Reg_MWh	Power generation of the built-in electric energy meter, the MWh part.	1 MWh

06 Drive Status

06 Drive status	**Drive status word**
Serial number Name /Value	Description

06.00 Status word1 Drive status word1 .

position	Name	Information
0	Ready	1=Drive ready to receive start command.
		0=Drive not ready.
1	Fault	1=Drive fault.
		0=Drive no fault.
2	Alarm	1=Drive warning.
		0=Drive no warning.
3	Limiting	1=Drive limited.
		0= Drive unlimited.
4	Running	1= Drive running.
		0=Drive not running.
5	Rev req	1=Drive starting reversal.
		0=Drive starting forward.
6	Start req	1=Driver received Start request.
		0=Drive not received Start request.
7	Stop req	1=Drive received shutdown request
		0=Drive not received shutdown request.
8	JOG active	1=Drive jog operation.
		0=Drive jog function not activated.
9	Int stop req	1=Drive internal forced shutdown activated.
		0=Drive forced shutdown function not activated.
10	Ext run enable	1=Drive external operation enabled.
		0=Drive external operation not enabled.
11	JOG2	1=Drive JOG2 activated.
		0= Drive JOG1 activated.
12	DC charged	1=DC high voltage capacitor charging completed.
		0=DC high voltage capacitor charging not completed.
13	Chg rly closed	1=Soft start relay closure.
		0=Soft start relay disconnect.
14	Ext2	1=Control place2 activated.
		0=Control place1activated.
15	Loc ctrl	1=Drive operates in remote control mode.
		0=Drive operates in the local control mode.

06 Drive status	**Drive status word**
06.01 Status word2	Drive status word2

position	Name	Information
0	Data log rdy	1=Software oscilloscope waveform cache updated.
		0=Software oscilloscope waveform cache not updated.
1	OFF1	1=OFF1 (Deceleration stop) activated.
		0=OFF1 (Deceleration stop) not activated.
2	OFF2	1=OFF2 (Emergency stop coast stop) activated.
		0=OFF2 (Emergency stop coast stop) not activated.
3	OFF3	1=OFF3 (Emergency stop deceleration stop) activated.
		0=OFF3 (Emergency stop deceleration stop) not activated.
4	Motor Brk	1= activated.
		0= not activated.
5	Ramp in zero	1=Ramp input forced to zero.
		0=Normal operation.
6	Ramp out zero	1= Ramp output forced to zero.
		0=Normal operation.
7	Ramp hold	1=Ramp input forced to keep.
		0= Normal operation.
8	Modulating	1= Modulating, IGBT being controlled.
		0=No modulating, IGBT not being controlled.
9	Modbus active	1=Built-in MODBUS Communication activated.
		0=Built-in MODBUS Communication not activated.
10	CANopen active	1=Built-in CAN Communication activated.
		0=Built-inCAN Communication not activated.
11	Profi-DP active	1=PROFIBUS-DP Communication activated.
		0=PROFIBUS-DP Communication not activated.
12	Fan on	1=Drive cooling fan is on.
		0=Drive cooling fan is off.
13	Start block	1=Start command not executed.
		0=Normal operation.
14	ID run req	1=Parameter identification function of the motor is activated.
		0=None.
15	Main power on	1=The main power is on.
		0=The main power supply is not normally powered or the voltage is insufficient.

<table>
<tr><th>06 Drive status</th><th>Drive status word</th></tr>
<tr><td>06.02 Status word3</td><td>Drive status word3
<table>
<tr><th>position</th><th>Name</th><th>Information</th></tr>
<tr><td>0</td><td>AC src active</td><td>1=AC power mode activated.
0=DC power mode activated.</td></tr>
<tr><td>1</td><td>DC src active</td><td>1=DC power mode activated.
0=DC power mode activated.</td></tr>
<tr><td>2</td><td>Start inhibit</td><td>1 = Start inhibit
0 = normal</td></tr>
<tr><td>3</td><td>Spdref limit</td><td></td></tr>
<tr><td>4</td><td>Trqref limit</td><td></td></tr>
<tr><td>5</td><td>Rem in local</td><td></td></tr>
<tr><td>6</td><td>Imax limit</td><td></td></tr>
<tr><td>7</td><td>Volt limit</td><td></td></tr>
<tr><td>8</td><td>PM sync loss</td><td></td></tr>
<tr><td>9</td><td>PM flux boost</td><td></td></tr>
<tr><td>10</td><td>Zero freq</td><td></td></tr>
<tr><td>11</td><td>Flux build</td><td></td></tr>
<tr><td>12</td><td>Mech brake open</td><td></td></tr>
<tr><td>13</td><td>Brake opened</td><td></td></tr>
<tr><td>14</td><td>Brake checking</td><td></td></tr>
<tr><td>15</td><td>Crane active</td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><th>06 Drive status</th><th>Drive status word</th></tr>
<tr><td>06.03 Speed ctrl stat</td><td>Speed control status word.
<table>
<tr><td>position</td><td>Name</td><td>Information</td></tr>
<tr><td rowspan="2">0</td><td rowspan="2">Zero speed</td><td>1=Actual speed has reached zero speed limit and zero speed delay.</td></tr>
<tr><td>0=Not enter the zero speed state.</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Reverse</td><td>1=Actual speed is negative, i.e. Reverse.</td></tr>
<tr><td>0=Actual speed is positive, i.e. Corotation。</td></tr>
<tr><td>2</td><td>Ramp up</td><td>1 = Ramp up, Speed absolute value increases.
0 = No acceleration.</td></tr>
<tr><td>3</td><td>Ramp down</td><td>1 = Ramp down, Speed absolute value decreases.
0 = No deceleration.</td></tr>
<tr><td>4</td><td>At setpoint</td><td>1 = Deviation of actual speed and ramp input in the speed window.</td></tr>
<tr><td>5</td><td>Reserved VF active</td><td>1 = VF scalar control activated.
0 = Vector control activated.</td></tr>
<tr><td>6</td><td>Regen active</td><td>1 = Power generation operation.
0 = Jog operation.</td></tr>
<tr><td>7</td><td>Reserved Open loop</td><td>1 = Open loop vector control activated.
0 = Open loop vector control not activated.</td></tr>
<tr><td>8</td><td>Pos ctrl</td><td>1 =Position control activated.</td></tr>
<tr><td>9</td><td>ACIM active</td><td>1 = Asynchronous motor activated.</td></tr>
<tr><td>10</td><td>PMSM active</td><td>1 = Synchronous motor activated.</td></tr>
<tr><td>11</td><td>SynRM active</td><td>1 = Synchronous reluctance motor activated.</td></tr>
<tr><td>12</td><td>ID run</td><td>1 = Motor parameter auto-tuning activated.</td></tr>
<tr><td>13</td><td>Torque limit</td><td>1 = Torque limiting</td></tr>
<tr><td>14</td><td>Speed limit</td><td>1 = Speed limiting</td></tr>
<tr><td>15</td><td>Exc active</td><td>1 = Pre excitation of induction motor</td></tr>
</table></td></tr>
<tr><td>06.04 Infeed ctrl word</td><td>Retain</td></tr>
</table>

<table>
<tr><th>06 Drive status</th><th>Drive status word</th></tr>
<tr><td>06.05 Fieldbus CW</td><td>Field bus control word
<table>
<tr><th>Position</th><th>Name</th><th>Information</th></tr>
<tr><td rowspan="2">0</td><td rowspan="2">Stop</td><td>1=Drive stop.</td></tr>
<tr><td>0=Maintain current status.</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Start</td><td>1=Drive start.</td></tr>
<tr><td>0= Maintain current status.</td></tr>
<tr><td>2</td><td>StopMode OFF2</td><td>1 =Mandatory for emergency shutdown mode.</td></tr>
<tr><td>3</td><td>StopMode OFF3</td><td>1 =Mandatory for coast stop mode.</td></tr>
<tr><td>4</td><td>Local ctrl</td><td>1 =Request for local control.</td></tr>
<tr><td>5</td><td>StopMode ramp</td><td>1 =Mandatory for deceleration stop mode.</td></tr>
<tr><td>6</td><td>StopMode coast</td><td>1 =Mandatory for coast stop mode.</td></tr>
<tr><td>7</td><td>Run enable</td><td>1 = Run enable.
0 = Run inhibit.</td></tr>
<tr><td>8</td><td>Reset</td><td>0->1 Reset drive fault.</td></tr>
<tr><td>9</td><td>Jog1</td><td>1 = Jog 1 start.</td></tr>
<tr><td>10</td><td>Jog2</td><td>1 = Jog 2 start.</td></tr>
<tr><td>11</td><td>Remote</td><td>1 = Request for remote control.</td></tr>
<tr><td>12</td><td>Ramp in 0</td><td>1 =Force the input of the given ramp generator as 0.</td></tr>
<tr><td>13</td><td>Ramp hold</td><td>1 = Force the output of the given ramp generator to remain constant.</td></tr>
<tr><td>14</td><td>Ramp out 0</td><td>1 = Force the output of the given ramp generator as 0.</td></tr>
<tr><td>15</td><td>Ext2 sel</td><td>1 = Select external control place2.</td></tr>
</table></td></tr>
<tr><td>06.06 Encoder SW</td><td>Encoder status word
<table>
<tr><th>position</th><th>Name</th><th>Information</th></tr>
<tr><td rowspan="2">0</td><td rowspan="2">DOS</td><td>1=DOS fault.</td></tr>
<tr><td>0=Normal.</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">LOT</td><td>1=LOT fault.</td></tr>
<tr><td>0=Normal.</td></tr>
<tr><td>2</td><td>LOS</td><td>1 =LOS fault.
0 = Normal.</td></tr>
<tr><td>3:15</td><td>Reserved</td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><th>06 Drive status</th><th>Drive status word</th></tr>
<tr><td>06.07 PosCtrl SW</td><td>Position control status word
<table>
<tr><th>Position</th><th>Designation</th><th>Information</th></tr>
<tr><td rowspan="2">0</td><td rowspan="2">Pos sync</td><td>1=Position synchronized.</td></tr>
<tr><td>0=Position not synchronized.</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Pos end</td><td>1= Position completed.</td></tr>
<tr><td>0=Position not completed.</td></tr>
<tr><td>2</td><td>Mark rdy</td><td>1 =Reference signal ready.
0 = Reference signal not detected.</td></tr>
<tr><td>3</td><td>Mark load</td><td>1 = Loaded.
0 = Not loaded.</td></tr>
<tr><td>4:15</td><td>Reserved</td><td></td></tr>
</table></td></tr>
</table>

08 Fault&Alarm Log

08 Fault & Alarm Log	Fault and Alarm log	
08.00 Alarm Code	Latest Alarm Code.	-
08.01 Fault Code	Latest Fault Code.	-

09 System Info

09 System Info	Drive system Info	
09.00 Driver ID	Drive hardware code.	-
09.01 Drive type	Drive type.	-
09.02 Firmware version	Drive firmware version.	-
09.03 Encoder type	The encoder type indentified by the expansion card slot SLOT1.	-
09.04 PWM freq	The actual applicated carrier frequency of the system.	-
09.05 App macro active	The actual applicated macro of the system.	-
09.06 PM phase CM	The angle accuracy is sufficient to use when the common mode signal strength identified by the synchronous motor rotor initial angle reach to 150. It is used to instruct the user to adjust the parameter 60.11 of the injection current size to achieve the best search.	-
09.07 PM phase DIF	The angle accuracy is sufficient to use when the differential-mode mode signal strength identified by the synchronous motor rotor initial angle reach to 150. It will cause too loud noise if inject too much current; while the insufficient current signal strength may cause search error.	-

10 Start/Stop/Dir

<table>
<tr><th>10 Start/Stop/Dir</th><th>Selection of signal sources of start / stop / direction</th><th>Def</th></tr>
<tr><td>10.00 Ext1 start func</td><td>Select the signal source of the external control 1 (EXT1) start and the stop command. Note: this parameter cannot be changed when the drive is running.</td><td>In1FWD, In2 RVD=[2]</td></tr>
<tr><td>Not selected</td><td>The start function of control1 is not selected.</td><td>0</td></tr>
<tr><td>In1 RUN, In2 DIR</td><td>The signal source selected by the parameter of 10.01Ext1startin1 (Control 1 of the input 1) is the start signal (0= Stop，1= Start). selected by the parameter of 10.02Ext1 startin2 (Control 1 of the input 2) is the direction signal (0=Positive, 1=Reverse)</td><td>1</td></tr>
<tr><td>In1 FWD, In2 REV</td><td>The signal sources of the start and stop command are selected by the parameters of 10.01Ext1startin1 (Control 1 of the input 1) and 10.02Ext1startin2 (Control 1 of the input 2). The state transition of the signal source bit is explained as follows:
<table>
<tr><th>The status of the input1 of control1</th><th>The status of the input2 of control1</th><th>Command</th></tr>
<tr><td>0</td><td>0</td><td>Stop</td></tr>
<tr><td>1</td><td>0</td><td>Forward start</td></tr>
<tr><td>0</td><td>1</td><td>Reverse start</td></tr>
<tr><td>1</td><td>1</td><td>Stop</td></tr>
</table></td><td>2</td></tr>
<tr><td>RUN/STOP/DIR</td><td>The signal sources of the start and stop command are selected by the parameters of 10.01 Ext1 start in1 (Control 1 of the input 1), 10.02 Ext1 start in2 (Control 1 of the input 2) and 10.03 Ext1 start in3 (Control 1 of the input 3). The state transition of the signal source bit is explained as follows:
<table>
<tr><th>The status of the input1 of control1</th><th>The status of the input2 of control1</th><th>The status of the input3 of control1</th><th>Command</th></tr>
<tr><td>0 → 1</td><td>0</td><td>0</td><td>Forward start</td></tr>
<tr><td>0 → 1</td><td>0</td><td>1</td><td>Reverse start</td></tr>
<tr><td>X</td><td>1</td><td>X</td><td>Stop</td></tr>
<tr><td>0</td><td>0</td><td>X</td><td>Change Dir</td></tr>
</table></td><td>3</td></tr>
<tr><td>FWD/REV/STOP</td><td>The signal sources of the start and stop command are selected by the parameters of 10.01 Ext1 start in1 (Control 1 of the input 1), 10.02 Ext1 start in2 (Control 1 of the input 2) and 10.03 Ext1 start in3 (Control 1 of the input 3). The state transition of the signal source bit is explained as follows:
<table>
<tr><th>The status of the input1 of control1</th><th>The status of the input2 of control1</th><th>The status of the input3 of control1</th><th>Command</th></tr>
<tr><td>0 → 1</td><td>0</td><td>0</td><td>Forward start</td></tr>
<tr><td>0</td><td>0 → 1</td><td>0</td><td>Reverse start</td></tr>
<tr><td>X</td><td>X</td><td>1</td><td>Stop</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>Stop</td></tr>
</table></td><td>4</td></tr>
<tr><td>Fieldbus</td><td>Fieldbus communication control word decision.</td><td>5</td></tr>
</table>

10 Start/Stop/Dir	Selection of signal sources of start / stop / direction	Def
Panel	Start-stop button control by control panel.	6
10.01 Ext1 start In1	Select the input1 signal source of control1. *Refer to parameters of 10.00 Ext1 start func (Control ground 1 start function).*	DI1= [2048]
P.01.00.00 (Bit pointer)	User defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter group number, index No., item No. in turn. The actual value is determined by the current value of the parameter.)	
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI state, position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
10.02 Ext1 start In2	Select the signal source for input 1 of control2. *Refer to the parameters 10.01 Ext start In1 for relevant available options.*	DI2= [2049]
10.03 Ext1 start In3	Select the signal source for input 1 of control3. *Refer to the parameters 10.01 Ext start In1 for relevant available options.*	CONST.FALSE= [0]
10.04 Ext2 start func	Select the start and stop command signal source of the external control 2 (EXT2). *Refer to the parameters 10.00 Ext1 start func for relevant available options.*	Not selected
10.05 Ext2 start In1	Select the signal source for input 2 of control1. *Refer to the parameters 10.01 Ext start In1 for relevant available options.*	CONST.FALSE= [0]
10.06 Ext2 start In2	Select the signal source for input 2 of control2. *Refer to the parameters 10.01 Ext start In1 for relevant available options.*	CONST.FALSE= [0]
10.07 Ext2 start In3	Select the signal source for input 2 of control3. *Refer to the parameters 10.01 Ext start In1 for Relevant available options.*	CONST.FALSE= [0]
10.08 JOG1 start	Select the start signal source of Jog1, 0: No start command; 1: Has start command. *Refer to the pararameters of 10.01 Ext start In1 for relevant available options.*	CONST.FALSE= [0]
10.09 JOG2 start	Select the start signal source of Jog2, 0: No start command; 1: Has start command. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.FALSE= [0]
10.10 JOG enable	Select the JOG enable signal source, 0: JOG Inhibit; 1: JOG Enable. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.FALSE = [0]
10.11 Fault reset sel	Select the signal source of the fault reset command, 0: No reset command; 1: Has reset command. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.FALSE= [0]
10.12 Run enable	Select the enable signal source for operation, 0: Running is inhibited, 1: Running enable. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.TRUE= [1]

10 Start/Stop/Dir	Selection of signal sources of start / stop / direction	Def
10.13 Emergency stop	Select the signal source of the emergency stop command, 0: Emergency stop; 1: Keep the current state. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.TRUE= [1]
10.14 EM stop mode	Selection of emergency stop mode.	OFF21=[0]
OFF1	Deceleration stop, Deceleration time is the acceleration and deceleration time1.	0
OFF2	Coast stop	1
OFF3	Deceleration stop, Deceleration time is the emergency stop time	2
10.15 Start enable	Select the start enable signal source, 0: Start inhibit; 1: Start enable. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.TRUE= [1]
10.16 Upper limit	Select the signal source of the upper limit, 0: Limit activated; 1: Limit not activated. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.TRUE= [1]
10.17 Lower limit	Select the signal source of the lower limit. 0: Limit activated; 2: Limit not activated. *Refer to the parameters of 10.01 Ext start In1 for relevant available options.*	CONST.TRUE= [1]

11 Start/Stop Mode

11 Start/Stop Mode	Start Stop Mode Settings	Def
11.00 Stop mode	Stop mode.	RAMP= [0]
RAMP	Deceleration stop.	0
COAST	Coast stop.	1
11.01 Ext1/Ext2 sel	Select the signal source for switching control, 0: Select control 1 (Ext1), 1: Select control 2 (Ext2).	CONST.FALSE [0]
P.01.00.00	User defined pointer (01.00.00A from left to right take two digits as a set, indicates the parameter group number, Index No,Item No.. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI state, position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
11.02 Ext1 ctrl mode	Motor control mode of control1.	Speed = [0]
Speed	Speed mode	0
Torque	Torque mode	1
Min	Speed and torque mode, take the minimum value of speed regulation output or the torque given.	2
Max	Speed and torque mode, take the maximum value of speed regulation output or the torque given.	3
Add	Speed and torque mode, take the sum of the speed regulation output and the torque given.	4
Position	Point to point position control mode.	5
Homing	Position control mode with origin regression.	6
Profvel	Position control mode with trajectory planning.	7
11.03 Ext2 ctrl mode	Motor control mode of control 2. *Refer to the parameters of 11.02Ext1 ctrl mode for relative available options.*	Speed = [0]

11 Start/Stop Mode	Start Stop Mode Settings	Def
11.04 Local ctrl mode	Motor control mode in local control.	Speed = [0]
Speed	Speed mode. Speed given set by the parameter of *02.13 Control panel ref1*.	0
Torque	Torque mode. Torque given set by the parameter of *02.14Control panel ref2*.	1
11.05 Ext1 trig type	Select the trigger mode for control1.	Level = [1]
Edge	Edge trigger	0
Level	Level trigger	1
11.06 Ext2 trig type	Select the trigger mode for control2. *Refer to the parameters 11.05 Ext1 trig type for relevant available options.*	Level = [1]

13 Analog & pulse input

13 Analog & pulse in	Analog quantity and pulse input	Def
13.00 AI1 input max	Maximum value of analog input AI1.	10.000V
[0.000V, 10.000V]		-
13.01 AI1 input min	Minimum value of analog input AI1.	0.000V
[0.000V, 10.000V]		-
13.02 AI1 superv act	Action performed when AI1 exceeds the maximum or minimum range.	No action = [0]
No action	No action.	0
Fault	Report Fault.	1
Alarm	Report Alarm.	2
13.03 AI1 superv sel	Select the monitoring content of AI1.0:Monitor inhibited;1: Monitor enabled.	00b
BIT0: AI min sup	Whether the monitoring AI1 input value is less than the minimum value set by the parameters *13.01AI1 input min (AI1 Input minimum value).*	0
BIT1: AI max sup	Whether the monitoring AI1 input value is greater than the maximum value set by the parameters *13.00AI1 input max (AI1 Input maximum value).*	0
13.04 AI1 calibration	AI1 Correct selection.	No action = [0]
No action	No corrective action, or the corrective action has been completed.	0
AI_MIN_TUNE	Minimum value correction. Requires the voltage supplied to AI1 externally should be accordance with the corresponding value of the parameters of *13.01AI1 input min (AI1 Input minimum value).*	1
AI_MAX_TUNE	Maximum value correction. Requires the voltage supplied to AI1 externally should be accordance with the corresponding value of the parameters of *13.00 AI1 input max (AI1 Input maximum value).*	2
13.05 AI1 max scale	Maximum value of the converted analog AI1.	1500

13 Analog & pulse in	**Analog quantity and pulse input**	Def
[-32768, 32767]	The output value of the converted AI1 maximum input voltage.	-
13.06 AI1 min scale	The minimum value of the converted analog AI1.	0
[-32768, 32767]	The output value of the converted AI1 minimum input voltage.	-
13.07 AI1 sim enable	In debugging or other applications, user can enable the AI1 simulation function of the analog input by this parameter.	Disable = [0]
Disable	Turn off the simulation mode. The converted output of AI1 depends on the input voltage of AI1.	0
Enable	Enable simulation mode. The converted output of AI1 depends on the parameters of *13.08AI1 sim data (AI1simulation data).*	1
13.08 AI1 sim data	Simulation data of anolog AI1.	0
[-32768, 32767]	Set the converted output of AI1 when the emulation mode of AI1 is enabled.	-
13.09 AI1 filter time	Define the first-order low-pass filtering time constant of analog AI1.	0.10s
[0.01s, 10.00s]	Filter time constant.	-
13.10 AI2 input max	Maximum value of analog input AI2。	10.000V Or
[0.000mA, 20.000mA] or [0.000V, 10.000V]	Range and unit by parameter*13.17AI2 input type(AI2Input type)*Decision.	
13.11 AI2 input min	Minimum value of analog input AI2.	0.000 V Or 0.000mA
[0.000mA, 20.000mA] or [0.000V, 10.000V]	The value range and unit are determined by the parameter of *13.17 AI2 input type (AI2 Input type).* Decision.	
13.12 AI2 superv act	The performed action when AI2 exceeds the maximum or minimum range. *Refer to the parameters of 13.02AI1 superv act (AI1 Monitoring action) for relative available options.*	No action = [0]
13.13 AI2 superv sel	Select the contents of AI2 monitoring. *Refer to the parameters of 13.03AI1 superv sel (AI1 Monitoring options) for relative available options.*	00b
13.14 AI2 calibration	AI2 calibration selection. *Refer to the parameters of 13.04 AI1 calibration (AI1 Calibration selection) for relative available options.*	No action = [0]
13.15 AI2 max scale	Maximum value of the converted analog AI2.	1500
[-32768, 32767]	The output value of the converted AI2 maximum input voltage.	-
13.16 AI2 min scale	Minimum value of the converted analog AI2.	0
[-32768, 32767]	The output value of the converted AI2 minimum input voltage.	-
13.17 AI2 input type	The input type of analog AI2. Must be consistent with the dial-up position of the terminal panel dial-up switch S1. **Note: when using the 4~20mA current mode senso, user need to manually set the parameters of** *13.11AI2 input min (AI2 Input minimum value)* **as 4.000mA.**	Voltage = [0]

13 Analog & pulse in	Analog quantity and pulse input	Def
Voltage	Dial code switch or jumper wire to the letter “V” side, select the voltage type input.	0
Current	Dial switch to the letter “I” side, select the current type input.	1
13.18 AI2 sim enable	Simulation enable of analog AI2. *Refer to the parameters of 13.07 AI1 sim enable (AI1 Simulation enable).*	Disable = [0]
13.19 AI2 sim data	Simulation data of analog AI2. *Refer to the parameters of 13.08 AI1 sim data (AI1 Simulation data).*	0
13.20 AI2 filter time	Define the first-order low-pass filter time constant of analog AI2.	0.10s
[0.01s, 10.00s]	Filter time constant.	-
13.21 AI3 input max	Maximum value of analog input AI3.	10.000V or
[0.000mA, 20.000mA] or [0.000V, 10.000V]	The value range and the units are determined by the parameter of *13.28 AI3 input type (AI3 Input type).*	-
13.22 AI3 input min	Minimum value of analog input AI3.	0.000V or 0.000mA
[0.000mA, 20.000mA] or [0.000V, 10.000V]	The value range and the units are determined by the parameter of *13.28 AI3 input type (AI3 Input*	-
13.23 AI3 superv act	Action performed when AI3 exceeds the maximum or the minimum range. *Refer to the parameters of 13.02 AI1 superv act (AI1 Monitoring action) for relevant available options.*	No action = [0]
13.24 AI3 superv sel	Select the contents of the AI3 monitor. *Refer to the parameters of 13.03 AI1 superv sel (AI1Monitoring options) for relevant available*	00b
13.25 AI3 calibration	AI3 calibration selection. *Refer to the parameters of 13.04 AI1 calibration (AI1 Calibration selection) for relevant available options.*	None = [0]
13.26 AI3 max scale	Maximum value of the converted analog AI3.	1500
[-32768, 32767]	The output value of the converted AI3 maximum input voltage.	-
13.27 AI3 min scale	Minimum value of the converted analog AI3.	0
[-32768, 32767]	The output value of the converted AI3 minimum input voltage.	-
13.28 AI3 input type	The anlog AI3 input type. It must be consistent with the dial position of the terminal panel dial switch S2. **Note: when using the 4~20mA current type sensor, user need to manually set the parameters of** *13.22 AI3 input min(AI3 Input minimum value)***as 4.000mA.** *Refer to the parameters of 13.17 AI2 input type (AI2 Input type).*	Voltage = [0]
13.29 AI3 sim enable	Simulation enable of analog AI3. *Refer to the parameters 13.07 AI1 sim enable (AI1 Simulation enable).*	Disable = [0]
13.30 AI3 sim data	Simulation data of analog AI3. *Refer to the parameters of 13.08 AI1 sim data (AI1 simulation data).*	0

13 Analog & pulse in	Analog quantity and pulse input	Def
13.31 AI3 filter time	Define the first-order low-pass filtering time constant of analog AI3.	0.10s
[0.01s, 10.00s]	Filter time constant.	-
13.32 Freq input max	Maximum frequency of DI7 high speed pulse input.	10000Hz
[0Hz, 60000Hz]		-
13.33 Freq input min	Minimum frequency of DI7 high speed pulse input.	0Hz
[0Hz, 60000Hz]		-
13.34 Freq in max scale	The converted maximum output value of the frequency input.	1500
[-32768, 32767]	The output value of the converted maximum input frequency of the frequency input.	-
13.35 Freq inmin scale	The converted minimum output value of the frequency input.	0
[-32768, 32767]	The output value of the converted minimum input frequency of the frequency input.	-
13.36 Freq in sim enable	In debugging or other applications, user can enable the simulation enable of the frequency input by this parameter.	Disable = [0]
Disable	Turn off the simulation mode. The frequency input conversion output depends on the DI7 high speed pulse input.	0
Enable	Enable simulation mode. The frequency input conversion output depends on the parameters of *13.37Freq in sim data (Frequency input simulation data).*	1
13.37 Freq in sim data	Simulation data of the frequency input.	0
[-32768, 32767]	When the frequency input simulation mode is enabled, set the converted output value of the frequency input.	-
13.38 Freq in filter time	Define the filter time constant of the frequency input.	0.10s
[0.01s, 10.00s]	Filter time constant.	-

14 Digital I/O(Digital input and output)

14 Digital I/O	Digital input and output	Def
14.00 DI1 on delay	Digital input DI1 closure delay time.	2ms
[0, 65535 ms]	Closure delay time.	
14.01 DI1 off delay	Digital input DI1 disconnect delay time.	2ms
[0, 65535 ms]	disconnect delay time.	
14.02 DI2 on delay	Digital input DI2 closure delay time. *Refer to the parameters of 14.00 DI1 on delay (DI1 on delay).*	2ms
14.03 DI2 off delay	Digital input DI2 disconnect delay time. *Refer to the parameters of 14.01DI1 off delay (DI1 off delay).*	2ms

14 Digital I/O	Digital input and output	Def
14.04 DI3 on delay	Digital input DI3 on delay time. *Refer to the parameters of 14.00 DI1 on delay (DI1 on delay).*	2ms
14.05 DI3 off delay	Digital input DI3 off delay time. *Refer to the parameters of 14.01DI1 off delay (DI1 off delay).*	2ms
14.06 DI4 on delay	Digital input DI4 on delay time. *Refer to the parameters of 14.00 DI1 on delay (DI1 on delay).*	2ms
14.07 DI4 off delay	Digital input DI4 disconnect delay time. *See refer to the parameters of 14.01DI1 off delay (DI1 off delay).*	2ms
14.08 DI5 on delay	Digital input DI5 on delay time. *Refer to the parameters of 14.00 DI1 on delay (DI1 on delay).*	2ms
14.09 DI5 off delay	Digital input DI5 disconnect delay time. *Refer to the parameters of 14.01DI1 off delay (DI1 off delay).*	2ms
14.10 DI6 on delay	Digital input DI6 on delay time. *Refer to the parameters of 14.00 DI1 on delay (DI1on delay).*	2ms
14.11 DI6 off delay	Digital input DI6 disconnect delay time. *Refer to the parameters of 14.01DI1 off delay (DI1 off delay).*	2ms
14.12 DI7 on delay	Digital input DI7 on delay time. *Refer to the parametersof 14.00 DI1 on delay (DI1 on delay).*	2ms
14.13 DI7 off delay	Digital input DI7 disconnect delay time. *Refer to the parameters of 14.01DI1 off delay (DI1 off delay).*	2ms
14.14 DO1 on delay	Digital output DO1 on delay time.	0 ms
[0, 65535 ms]	Closed delay time.	
14.15 DO1 off delay	Digital output DO1 disconnect delay time.	0 ms
[0, 65535 ms]	Closed delay time.	
14.16 DO2 on delay	Digital output DO2 on delay time.*See parameters14.14DO1 on delay(DO1on delay).*	0 ms
14.17 DO2 off delay	Digital output DO2 disconnect delay time. *Refer to the parameters of 14.14DO1 off delay (DO1 off delay).*	0 ms
14.18 RO1 on delay	Digital output RO1 closure delay time. *Refer to the parameters of 14.14DO1 on delay (DO1on delay).*	0 ms
14.19 RO1 off delay	Digital output RO1 disconnect delay time. *Refer to the parameters of 14.14DO1 off delay (DO1 off delay).*	0 ms
14.20 RO2 on delay	Digital output RO2 on delay time. *Refer to the parameters of 14.14DO1 on delay (DO1 on delay).*	0 ms
14.21 RO2 off delay	Digital output RO2 disconnect delay time. *Refer to the parameters of 14.14DO1 off delay (DO1 off delay).*	0 ms
14.22 DI logic	The logical type of digital input. The normal logic indicates that the terminal and the COM terminal are short circuit to 1, on the contrary is 0. The anti logic indicates that the terminal is disconnected from the COM terminal by 1, on the contrary by 0.	0000000b
BIT0: DI1	DI1 logic, 0=Normal, 1=Anti logic.	0
BIT1: DI2	DI2 logic, 0=Normal, 1=Anti logic.	0

14 Digital I/O	Digital input and output	Def
BIT2: DI3	DI3 logic, 0=Normal, 1=Anti logic.	0
BIT3: DI4	DI4 logic, 0=Normal, 1=Anti logic.	0
BIT4: DI5	DI5 logic, 0=Normal, 1=Anti logic.	0
BIT5: DI6	DI6 logic, 0=Normal, 1=Anti logic.	0
BIT6: DI7	DI7 logic, 0=Normal,1=Anti logic.	0
14.23 DI sim enable	Simulation enable of the digital input. 0=Simulation shutdown, 1=Simulation enabled.	0000000b
BIT0: DI1	DI1 The simulation enable or data	0
BIT1: DI2	DI2 The simulation enable or data	0
BIT2: DI3	DI3 The simulation enable or data	0
BIT3: DI4	DI4 The simulation enable or data	0
BIT4: DI5	DI5 The simulation enable or data	0
BIT5: DI6	DI6 The simulation enable or data	0
BIT6: DI7	DI7 The simulation enable or data	0
14.24 DI sim data	Simulation data of the digital input. 0: Terminal disconnection, 1: Terminal closure. *Refer to parameters of 14.23DI sim enable (DI Simulation enable).*	0000000b
14.25 DI status undelay	Digital input status before the delay link, read-only. *Refer to parameters 14.22 DI logic (DI Input logic).*	-
BIT0: DI1	DI1 Actual state.	
BIT1: DI2	DI2 Actual state.	
BIT2: DI3	DI3 Actual state.	
BIT3: DI4	DI4 Actual state.	
BIT4: DI5	DI5 Actual state.	
BIT5: DI6	DI6 Actual state.	
BIT6: DI7	DI7 Actual state.	
14.26 DO logic	Logical type of the digital output. When the normal logic signal is 1, the output terminal is closed, on the contrary is disconnected. When the anti logic signal is 0, the output terminal is closed, on the contrary is disconnected.	0000b
BIT0: DO1	DO1 Logic, 0=Normal,1=Anti logic.	0
BIT1: DO2	DO2 Logic, 0=Normal,1=Anti logic.	0

14 Digital I/O	Digital input and output	Def
BIT2: RO1	RO1 Logic, 0=Normal, 1=Anti logic.	0
BIT3: RO2	RO2 Logic, 0=Normal, 1=Anti logic.	0
14.27 DO sim enable	Digital output simulation enable, 0: Simulation shutdown, 1: Simulation enable.	0000b
BIT0: DO1	DO1 simulation enable or data	0
BIT1: DO2	DO2 simulation enable or data	0
BIT2: RO1	RO1 simulation enable or data	0
BIT3: RO2	RO2 simulation enable or data	0
14.28 DO sim data	Simulation data of the digital output. 0: Terminal disconnection, 1: Terminal closure. *Refer to parameters 14.27 DO sim enable (DO Simulation enable).*	0000b
14.29 DO1 source	Set the signal source DO1. *Refer to parameters 14.26 DO logic (DO Output logic) for the meaning of*	Running = [6148]
P.01.00.00	User defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter group number, index and item. The actual value is determined by the current value of the parameter).	-
CONST.FALSE	Has been 0	0
CONST.TRUE	Has been 1	1
Ready	Ready *(06.00 Status word 1, position 0)*	6144
Running	Drive running *(06.00 Status word 1, position 4)*	6148
Fault	Driver fault *(06.00 Status word 1, position 1)*	6145
Alarm	Drive alarm *(06.00 Status word 1, position 2)*	6146
Start req	Drive received start request *(06.00 Status word 1, position 6)*	6150
Ext2	Drive controlled by external control2 *(06.00 Status word 1, position 14)*	6158
Loc ctrl	Drive in local control *(06.00 Status word 1, position 15)*	6159
Zero speed	Drive output is 0 *(06.03 Speed control status word, position 0)*	6192
Reverse	Drive output is negative *(06.03 Speed control status word, position 1)*	6193
At setpoint	Drive output is equal with settings *(06.03 Speed control status word, position 4)*	6196
Torq limit	Drive torque limit running *(06.03 Speed control status word, position 13)*	6205
Speed limit	Drive speed limit running *(06.03 Speed control status word, position 14)*	6206
14.30 DO2 source	Set the signal source of DO2. *Refer to parameters 14.29 DO1 source (DO1 Signal source) for relevant available options.*	Fault = [6145]

14 Digital I/O	**Digital input and output**	Def
14.31 RO1 source	Set the signal source of RO1. *Refer to parameters 14.29 DO1 source (DO1 Signal source) for relevant available option.*	Running = [6148]
14.32 RO2 source	Set the signal source of RO2. *Refer to parameters 14.29 DO1 source (DO1Signal source) for relevant available options.*	Fault = [6145]
14.33 DO1 level type	Set DO1 signal type.	Level = [1]
Edge	Output is edge pulse mode.	0
Level	Output is level mode.	1
14.34 DO1 edge type	Set DO1 signal type.	Rising = [0]
Rising	Trigger the DO pulse output by rising edge.	0
Falling	Trigger the DO pulse output by falling edge.	1
Both	Trigger the DO pulse output by rising and falling edge.	2
14.35 DO1 pulse width	Set the pulse output width of DO1.	500ms
[0, 65535ms]		1ms
14.36 DO2 level type	Set DO2 signal type.	Level = [1]
Edge	Output is edge pulse mode.	0
Level	Output is level mode.	1
14.37 DO2 edge type	Set DO2 signal type.	Rising = [0]
Rising	Trigger the DO pulse output by rising edge.	0
Falling	Trigger the DO pulse output by falling edge.	1
Both	Trigger the DO pulse output by rising and falling edge.	2
14.38 DO2 pulse width	Set the pulse output width of DO2.	500ms
[0, 65535ms]		1ms
14.39 RO1 level type	Set RO1 signal type.	Level = [1]
Edge	Output is edge pulse mode.	0
Level	Output is level mode.	1

14 Digital I/O	Digital input and output	Def
14.40 RO1edge type	Set RO1 signal type.	Rising = [0]
Rising	Trigger the DO pulse output by rising edge.	0
Falling	Trigger the DO pulse output by falling edge.	1
Both	Trigger the DO pulse output by rising and falling edge.	2
14.41 RO1 pulse width	Set the pulse output width of RO1.	500ms
[0, 65535ms]		1ms
14.42 RO2 level type	Set RO2 signal type.	Level = [1]
Edge	Output is edge pulse mode.	0
Level	Output is level mode.	1
14.43 RO2 edge type	Set RO2 signal type.	Rising = [0]
Rising	Trigger the DO pulse output by rising edge.	0
Falling	Trigger the DO pulse output by falling edge.	1
Both	Trigger the DO pulse output by rising and falling edge.	2
14.44 RO2 pulse width	Set the pulse output width of RO2.	500ms
[0, 65535ms]		1ms
14.45 DO JOG mask	Set whether the DO output is shielded or not at JOG. Refer to 14.26 DO logic.	0

15 Analog & pulse out

15 Analog & pulse out	Analog output and pulse output	Def
15.00 AO1 source	Select the signal source of analog output AO1.	Motor speed =[256]
P.01.00	User defined pointer (01.00 from left to right take two digits as a set, indicates the parameter group number and index. The actual value is determined by the current value of the parameter).	-
Zero	Always be 0.	0
Motor speed	*Refer to parameters 01.00 Motor speed (motor speed).*	256
Output frequency	*Refer to parameters 01.01 Output frequency (output frequency).*	257
DC bus voltage	*Refer to parameters* 01.02 DC bus voltage *(DC Bus Voltage).*	258

15 Analog & pulse out	**Analog output and pulse output**	Def
Motor current	*Refer to parameters 01.03 Motor current (Motor current).*	259
Motor current %	*Refer to parameters 01.04* Motor current % *(Motor current percentage).*	260
Motor slip est	*Refer to parameters 01.12* Motor slip est *(Estimated value of motor slip).*	268
Output voltage	*Refer to parameters 01.21 Output voltage (output voltage).*	277
Motor torque	*Refer to parameters01.22 Motor torque (Motor torque).*	278
Motor temperature	*Refer to parameters 01.23 Motor temperature (Motor temperature).*	279
Output power	*Refer to parameters 01.28 Output power (output power).*	284
15.01 AO1 output max	Define the maximum value of the analog output AO1 output.	10.000V
[0.000mA, 20.000mA] Or [0.000V, 10.000V]	The value range and the unit are determined by the parameter *15.08 AO1 output type (AO1 type of output).*	-
15.02 AO1 output min	Define the minimum value of the analog output AO1 output.	0.000V
[0.000mA, 20.000mA] Or [0.000V, 10.000V]	The value range and the unit are determined by the parameter *15.08 AO1 output type (AO1 type of output).*	-
15.03 AO1 source max	Define the maximum value of the signal selected via the parameter *15.00 AO1 source (AO1signal source). Refer to parameters of 15.07 AO1 output mode (AO1 Output mode) for corresponding output value of AO1.*	15000
[-32768, 32767]		-
15.04 AO1 source min	Define the minimum value of the signal selected via the parameter *15.00 AO1 source (AO1signal source). Refer to parameters of 15.07 AO1 output mode (AO1Output mode) for corresponding output value of AO1.*	0
[-32768, 32767]		-
15.05 AO1 sim data	Set the output voltage or current of AO1 when simulation enabled.	10.000V
[0mA, 20.000mA] Or [0V, 10.000V]		-
15.06 AO1 sim enable	In debugging or other application occasions, user can enable the simulation function of the analog output of AO1 via this parameter.	Disable = [0]
Disable	Simulation function turn off, the output voltage or current of AO1 depends on the actual value of the signal source.	0
Enable	Simulation function enabled. The output voltage or current of AO1 depends on the setting value of the parameters *15.05 AO1 sim data (AO1 simulation data).*	1
15.07 AO1 output mode	The output mode determines the correspondence between the maximum and minimum values of the AO1 signal source and the AO1 output.	Normal = [0]

15 Analog & pulse out	Analog output and pulse output	Def
Normal	Keep the symbol bit of the signal source, i.e. the maximum value of the signal source corresponds to the maximum output of AO, the minimum value of the signal source corresponds to the minimum value of the AO output.	0
Absolute	Take the absolute value of the signal source, i.e. of the maximum and minimum value of the signal source, take the greater one of the two corresponds to the maximum value of AO output, while the signal source is 0 corresponds to the minimum value of AO output.	1
15.08 AO1 output type	AO1 output type, must be consistent with the jumper position of the terminal panel jumper switch J1. **Note: To achieve 4~20mA output, user need to manually set the parameters** *15.02 AO1output min (AO1 Output minimum value)* **as 4.000mA.**	Voltage = [0]
Voltage	Jumper on the letter "V" side, Select the voltage type output.	0
Current	Jumper on the letter "I" side, select the current type output.	1
15.09 AO1 filter time	Define the filter time constant of AO1.	0.1s
[0.01s, 10.00s]	Filter time constant.	-
15.10 AO2 source	Selection of signal source for analog output AO2. *Refer to parameters 15.00 AO1 source (AO1 signal source) for relevant available options.*	Motor current %= [260]
15.11 AO2 output max	Define the maximum value of the analog output AO2 output.	10.000V
[0.000mA, 20.000mA] or [0.000V, 10.000V]	The range value and the unit determined by the parameter of *15.18 AO2output type (AO2type of output).*	-
15.12 AO2 output min	Define the minimum value of the analog output AO2 output.	0.000V
[0.000mA, 20.000mA] or [0.000V, 10.000V]	The range value and the unit determined by the parameter *15.18 AO2 output type (AO2 type of output).*	-
15.13 AO2 source max	Define the maximum value of the signal selected by the parameter of *15.10 AO2 source (AO2 signal source). Refer to the parameters of 15.17 AO2 output mode for corresponding AO2 output value.*	15000
[-32768, 32767]		-
15.14 AO2 source min	Define the minimum value of the signal selected by the parameter of *15.10 AO2 source (AO2 signal source). Refer to the parameters of 15.17 AO2 output mode for corresponding AO2 output value.*	0
[-32768, 32767]		-
15.15 AO2 sim data	Simulation data of analog AO2. *Refer to the parameters of 15.05 AO1 sim data (AO1 simulation data).*	10.000V
15.16 AO2 sim enable	Simulation enable of analog AO2. *Refer to the parameters of 15.06 AO1 sim enable (AO1 Simulation enable).*	Disable = [0]

15 Analog & pulse out	**Analog output and pulse output**	Def
15.17 AO2 output mode	The output mode determines the correspondence between the maximum and minimum values of the AO2 signal source and the output of AO2. *Refer to the parameters 15.07 AO1 output mode (AO1 output mode) for available options.*	Normal = [0]
15.18 AO2 output type	AO2 output type, must be consistent with the jumper position of the terminal panel jumper switch J2. **Note: To achieve 4~20mA output, user need to manually set the parameters** *15.12 AO1 output min (AO1 Output minimum value)* **as 4.000mA.** *Refer to the parameters of 15.08 AO1 output type (AO1 output type).*	Voltage = [0]
15.19 AO2 filter time	Define the filter time constant of AO2.	0.1s
[0.01s, 10.00s]	Filter time constant.	-
15.20 Freq out source	Select the signal source of the pulse output. **Note: to use the frequency output function, user need to set the parameters** *15.28 Freq out enable (Frequency output enable). Refer to the parameters15.00 AO1 source for relevant available options.*	0
15.21 Freq out max	Maximum frequency of DO2 high speed pulse output.	10000Hz
[0Hz, 60000Hz]		-
15.22 Freq out min	Minimum frequency of DO2 high speed pulse output.	0 Hz
[0Hz, 60000Hz]		-
15.23 Freq out src max	The actual signal value corresponding to the maximum frequency output value.	15000
[-32768, 32767]		-
15.24 Freq out src min	The actual signal value corresponding to the minimum frequency output value.	0
[-32768, 32767]		-
15.25 Freq out sim enable	In debugging or other applications occasion, user can enable the simulation function of the frequency outputvia this parameter. **Note: to use this function, user need to enable the high-speed pulse output at first.** *Refer to the rameters of 15.28 Freq out enable (Frequency output enable).*	Disable = [0]
Disable	Turn off the simulation mode, the output frequency of DO2 depends on the actual value of the signal	0
Enable	Enable the emulation mode, the output frequency of DO2 depends on the set value of the parameters of *15.26Freq out sim data (Frequency output simulation data).*	1
15.26 Freq out sim data	When the frequency output simulation is enabled, set its output frequency.	10000 Hz
[0Hz, 60000Hz]		-
15.27 Freq out filter time	Define the filter time constant of the frequency output.	0.1s
[0.01s, 10.00s]	Filter time constant.	-

15 Analog & pulse out	Analog output and pulse output	Def
15.28 Freq out enable	DO2 can not only achieve the switch output, but also to achieve the frequency output (i.e. high-speed pulse output), the default is switch output. User can enable the frequency output via this parameter.	Disable = [0]
Disable	Frequency output function disabled.	0
Enable	Frequency output function enabled.	1

16 System

16 System	Drive system settings. Parameter lock, Parameter restore, User parameter setting, etc.	Def
16.00 Local lock	Select the signal source of inhibiting local control (LOC/REM button on the control panel). 0: local control permitted, 1: local control inhibited.	CONST.FALSE = [0]
P.01.00.00	User defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, and item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *（02.00 DI state，position 0）*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
16.01 Parameter lock	Select the status of the parameter lock. The parameter lock prevents the parameter from being modified.	Open= [0]
Open	Parameter lock open. Parameter values can be modified.	0
Locked	Locked. The parameter values cannot be modified from the control keyboard.	1
Not saved	Parameters lock open. User can modify the parameter values, but changes will not be saved if the power is cut off.	2
16.02 Pass code	Enter different passwords to obtain different parameters access rights.	0
[0, 65535]		-
16.03 Param restore	Restore the default value of the parameters. This parameter is automatically restored to 0 only after the operation is complete. *Affects only the currently active parameter set.*	Done= [0]
Done	No action or parameter restore completed.	0

<table>
<tr><th>16 System</th><th>Drive system settings. Parameter lock, Parameter restore, User parameter setting, etc.</th><th>Def</th></tr>
<tr><td>Default</td><td>Restore to custom defaults, excluding motor and encoder related parameters.</td><td>1</td></tr>
<tr><td>Clear all</td><td>Restore all parameters to the custom defaults.</td><td>2</td></tr>
<tr><td>Factory</td><td>Reserved for manufacturers.</td><td>3</td></tr>
<tr><td>16.04 Param save manual</td><td>Save the parameters manually. This parameter is automatically restored to 0 after the operation is complete. Affects only the currently active parameter set.</td><td>Done= [0]</td></tr>
<tr><td>Done</td><td>No action or parameter save completed.</td><td>0</td></tr>
<tr><td>Save</td><td>Request to save the parameters to the memory, next time will be automatically restored when power on.</td><td>1</td></tr>
<tr><td>16.05 Param set sel</td><td>Load the specified parameter set to the current active parameter set, or save the current active parameter set to the specified parameter set. This parameter is automatically restored to 0 when the operation is completed.</td><td>Norequest= [0]</td></tr>
<tr><td>No request</td><td>No request or operation completed.</td><td>0</td></tr>
<tr><td>Load by I/O</td><td>The parameter set 1~4 is selected by a combination of parameters of 16.08 Para set in1 (Parameter set switch input 1) and 16.09 Para set in2(Parameter set switch input 2)Combined selection parameter set 1~4：
<table>
<tr><th>Parameter set switch input 1 Status</th><th>Parameter set switch input 2 Status</th><th>Selected user parameter set</th></tr>
<tr><td>0</td><td>0</td><td>Load the parameter set1</td></tr>
<tr><td>1</td><td>0</td><td>Load the parameter set2</td></tr>
<tr><td>0</td><td>1</td><td>Load the parameter set3</td></tr>
<tr><td>1</td><td>1</td><td>Load the parameter set4</td></tr>
</table></td><td>1</td></tr>
<tr><td>Load set1</td><td>Load parameter set 1 to the current active parameter set.</td><td>2</td></tr>
<tr><td>Load set2</td><td>Load parameter set 2 to the current active parameter set.</td><td>3</td></tr>
<tr><td>Load set3</td><td>Load parameter set 3 to the current active parameter set.</td><td>4</td></tr>
<tr><td>Load set4</td><td>Load parameter set 4 to the current active parameter set.</td><td>5</td></tr>
<tr><td>Save to set1</td><td>Save current active parameter set to parameter set1.</td><td>6</td></tr>
<tr><td>Save to set2</td><td>Save current active parameter set to parameter set2.</td><td>7</td></tr>
<tr><td>Save to set3</td><td>Save current active parameter set to parameter set3.</td><td>8</td></tr>
<tr><td>Save to set4</td><td>Save current active parameter set to parameter set4.</td><td>9</td></tr>
<tr><td>16.08 Param set in1</td><td>This parameter is valid only if the parameter 16.05 Param set sel (Parameter set switching control) choose 1 (Load by IO).</td><td>CONST. FALSE</td></tr>
<tr><td>P.01.00.00</td><td>User defined pointer (01.00.00) from left to right take two digits as a set, indicates the parameter set, index, item No. in turn. The actual value is determined by the current value of the parameter) .</td><td>-</td></tr>
<tr><td>CONST.FALSE</td><td>Always be 0</td><td>0</td></tr>
<tr><td>CONST.TRUE</td><td>Always be 1</td><td>1</td></tr>
<tr><td>DI1</td><td>Digital input DI1 (02.00 DI status, Position 0)</td><td>2048</td></tr>
<tr><td>DI2</td><td>Digital input DI2</td><td>2049</td></tr>
</table>

16 System	Drive system settings. Parameter lock, Parameter restore, User parameter setting, etc.	Def
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
16.09 Param set in2	This parameter is valid only when the parameters *16.05 Param set sel (Parameter set switching control)* choose 1 (Load by IO). *Refer to parameters of 16.08 Param set in1 (Parameter set switching input 1) for relevant available options*	CONST .FALSE = [0]
16.10 Set as default	Set the current value of all parameters to default value. This parameter will automatically restore to 0 when the operation is completed. *Refer to parameters of 16.03 Param restore (Parameter recovery).*	Done = [0]
Done	No request or operation completed.	0
Save as default	Request to save the current value of all parameters as custom default value.	1
16.11 Fan on temp	Cooling fan turn on temperature value	40.0℃
[0.0, 150.0℃]	Fan turn on temperature.	
16.12 Fan off temp	Cooling fan turn off temperature value.	30.0℃
[0.0, 150.0℃]	Fan turn off temperature.	
16.13 Fan off delay	Delay time of fan off after shutdown when using the operating signal to control the fan.	30.0s
[0.0, 6553.5s]	Fan off delay time.	
16.14 Fan ctrl mode	Control mode of the cooling fan.	Auto = [0]
Auto	The fan operates automatically according to the temperature of the radiator.	0
On while run	The fan runs, when drive running. When the drive stops, fan stops after delay.	1
Always on	Fan always run.	2
Always off	Fan always stop. Be careful: select this mode may cause overheating.	3
16.15 System reboot	System manual reset request. This parameter is automatically restored to 0 after the operation is completed.	No request
No request	No request or reset completed.	0
Reboot request	Request reset.	1
16.16 System language	System language setting.	Chinese = [1]

16 System	Drive system settings. Parameter lock, Parameter restore, User parameter setting, etc.	Def
English	Choose English as system language.	0
Chinese	Choose Chinese as system language.	1

17 Data logger

17 Data logger	Software Oscilloscope Setup	Def
17.00 Data log enable	Enable of the function of the software oscilloscope.	Enable = [1]
Disable	Turn off the oscilloscope can save CPU resources.	0
Enable	Enable oscilloscope	1
17.01 Acquire mode	The data acquisition mode of the oscilloscope is consistent with the usage method of the physical	Normal = [1]
Auto	No need to trigger the signal, the oscilloscope has been taking sample.	0
Normal	Normal trigger mode. Collection will start each time the trigger condition is satisfied, until the entire screen updated.	1
Single	Single trigger mode. Collection will start when the trigger condition is satisfied and will stop automatically when the collection is completed, waiting for the waveform to read.	2
17.02 Sample rate	Data sampling rate, i.e. the number of points collected in 1 second. If 1000 represents a collection of 1000 points per second，that is one data per 1ms for collection. If the parameter exceeds the carrier frequency by 2 times, then the actual sampling rate will drop to 2 times of the carrier frequency.	1000Hz
[10Hz, 24000Hz]	Sampling rate.	
17.03 CH1 source	Selection of the signal source for oscilloscope channel 1	Iu
17.04 CH2 source	Selection of the signal source for oscilloscope channel 2.	Iv
17.05 CH3 source	Selection of the signal source for oscilloscope channel 3.	
17.06 CH4 source	Selection of the signal source for oscilloscope channel 4.	
17.07 CH5 source	Selection of the signal source for oscilloscope channel 5.	
17.08 CH6 source	Selection of the signal source for oscilloscope channel 6.	

17 Data logger	Software Oscilloscope Setup	Def
17.09 CH7 source	Selection of the signal source for oscilloscope channel 7.	
17.10 CH8 source	Selection of the signal source for oscilloscope channel 8.	
17.11 Trigger source	Selection of the signal source for oscilloscope trigger channel.	
17.12 Force trig	Forced trigger request.	Done = [0]
Done	Completed.	0
Force trig	Forced trigger request.	1
17.13 Trig level	Set the trigger level. This parameter does not work in auto- trigger mode.	0
[-32768, 32767]	Set trigger level。	-
17.14 Event trig source	Select the event triggered signal source. 0: No trigger, 1: trigger.	CONST.FALSE[0]
P.01.00.00	User defined pointer (01.00.00 from left to right take two digits as a set, indicating the parameter group number, Index, Item No. in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
17.15 Trig edge sel	The trigger edge setting, which is used for the signal source of the trigger, is specified by the parameter of 17.11 Trigger source.	Rising = [0]
Rising	Rising edge trigger acquisition.	0
Falling	Falling edge trigger acquisition.	1
Both	Rising and falling edge trigger acquisition.	2
17.16 Event edge sel	The event edge setting used for trigger is specified by the parameter of 17.14 Event trig source. *Refer to the parameter 1715 Trig edge sel for relevant available options.*	Rising = [0]
17.17 Channel num	Setting for the number of channels of the oscilloscope. When the number of channels is less than 8, the part of the parameters from 17.03 to 17.10 does not work, by the front is preferred.	6
[1, 8]	Channel number setting.	-

17 Data logger	Software Oscilloscope Setup	Def
17.18 Channel size	Data length of each channel. System automatically calculates, for PC use. Read only.	-

18 Fault log

18 Fault log	**Fault log**	Def
18.00 Read index	The serial number of the fault record to be read. If you want to read the current fault record, set this parameter to 1. If you want to read the tenth fault record, set this parameter to 10.	0
[0, 99]		
18.01 Fault record num	Indicates the total number of fault records of the system. Read only.	-
18.02 Fault record clear	Set this parameter to 1 and clear all fault records. This parameter is automatically restored to 0 when the operation is completed.	
18.03 Fault code	The fault record data read from parameter 18.00 will be stored in parameter from 18.03 to 18.20, which including the fault code, the length of the fault additional information, the address and the content of additional fault information. Access to peripheral devices.	
18.04 Fault info len		
18.05 Fault info1 addr		
18.06 Fault info1 data		
18.07 Fault info2 addr		
18.08 Fault info2 data		
18.09 Fault info3 addr		
18.10 Fault info3 data		
18.11 Fault info4 addr		
18.12 Fault info4 data		
18.13 Fault info5 addr		
18.14 Fault info5 data		
18.15 Fault info6 addr		
18.16 Fault info6 data6		
18.17 Fault info7 addr		

18 Fault log	Fault log	Def
18.18 Fault info7 data		
18.19 Fault info8 addr		
18.20 Fault info8 data		
18.21 Fault code 1	The latest first fault code. Read-only.	
18.22 Fault code 2	The latest second fault code. Read-only.	
18.23 Fault code 3	The latest third fault code. Read-only.	
18.24 Fault code 4	The latest fourth fault code. Read-only.	
18.25 Fault code 5	The latest fifth fault code. Read-only.	
18.26 Fault code 6	The latest sixth fault code. Read-only.	
18.27 Fault code 7	The latest seventh fault code. Read-only.	
18.28 Fault code 8	The latest eighth fault code. Read-only.	

19 Speed Calculation

19 Speed Calculation	Speed Calculation	Def
19.00 Speed scaling	Define the final speed value for acceleration, as well as the initial speed value in deceleration. Similar to the maximum frequency of drives.	1500rpm
[150rpm, 30000rpm]		
19.01 Speed filter time	Define the filtering time of the speed feedback.	2.0ms
[0.0ms, 10.0ms]		
19.02 Zero speed delay	Define the zero speed holding time for deceleration stop.	0.5s
[0.0s, 6000.0s]		
19.03 Zero speed level	Define the initial speed value of zero speed holding.	30rpm
[0 rpm, 1500rpm]		
19.04 Speed window	Define the speed window range of the speed to reach.	30rpm
[0rpm, 1500rpm]		

20 Limits

20 Limits	Limits Control	Def
20.00 Maximum speed	Define the maximum allowed speed.	1500rpm
[-30000rpm, 30000rpm]	Maximum speed.	
20.01 Minimum speed	Define the minimum allowed speed.	-1500rpm
[-30000rpm, 30000rpm]	Minimum speed.	
20.02 Pos speed enable	Select the signal source of the corotation (speed given value is positive) to enable the command. 0: No positive rotation; 1: Allow positive rotation.	CONST.TRUE =[1]
P.01.00.00	User defined pointer (01.00.00 from left to right take two digits as a set, indicating the parameter set, index, item No. in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1*(02.00 DI State,position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
20.03 Neg speed enable	Select the signal source of reverse (the speed given value is negative) enable command. 0: reverse inhibited 1: reverse allow. *Refer to parameters 20.02Pos speed enable for relevant available options.*	CONST.TRUE = [1]
20.04 Torque ref max	Maximum value of the torque given. Relative to the rated torque of motor.	150.0%
[0%, 300.0%]		
20.05 Torque ref min	Minimum value of the torque given. Relative to the rated torque of motor.	-150.0%
[-300.0%, 0%]		
20.06 Max motor torque	The permitted maximum motor torque. Relative to the rated torque of motor.	150.0%
[0.0%, 300.0%]		
20.07 Max regen torque	The permitted maximum generator torque. Relative to the rated torque of motor.	150.0%

20 Limits	Limits Control	Def
[0.0%, 300.0%]		

21 Speed Reference

21 Speed Reference	Speed Reference	Def
21.00 Speed ref1 src	Select the signal source for the speed setpoint 1. Also can refer to parameters *21.02 Speedref1 func (Speed given 1 ways)*	AI1scaled = [515]
P.01.00	User-defined pointer (01.00 from left to right take two digits a set, indicates the parameter set and the index in turn. The actual value is determined by the current value of the parameter.)	-
Zero	Always zero	0
AI1 scaled	*Refer to parameters 02.03 AI1 scaled (AI1 scaled)*	515
AI2 scaled	*Refer to parameters 02.05 AI2 scaled (AI2 scaled)*	517
AI3 scaled	*Refer to parameters 02.07 AI3 scaled (AI3 scaled)*	519
Freq in scaled	*Refer to parameters 02.11 Freq in scaled (Freq in scaled)*	523
Control panel ref1	*Refer to parameters 02.13 Control panel ref1 (Control panel ref 1).*	525
Control panel ref2	*Refer to parameters 02.14 Control panel ref2 (Control panel ref2)*	526
Fieldbus ref1	*Refer to parameters 02.15 Fieldbus ref1 (Fieldbus ref1)*	527
Fieldbus ref2	*Refer to parameters 02.16 Fieldbus ref2 (Fieldbus ref2)*	528
Motor potent out	*Refer to parameters 03.01 Motor potent out (Motor potent out)*	769
Const speed out	*Refer to parameters 03.02 Const speed out (Const speed out).*	770
Process PID out	*Refer to parameters 04.04 Process PID out (Process PID out).*	1028
21.01 Speed ref2 src	Select the signal source for the speed setpoint 2. *Refer to parameters 21.00 Speed ref1 src for relevant available options.*	AI2 scaled = [517]
21.02 Speed ref1 func	Define the mathematical function of the two reference signal synthesis speed setpoint2 which are selected by the parameters *21.00 Speed ref1 src (Signal source for givenspeed 1)* and *21.01 Speed ref2 src (Signal source for givenspeed 2).*	Ref1 = [0]
Ref1	The signal selected by the parameter *21.00 Speed ref1src (Signal source for speed given 1)* is used as the speed given value1.	0
Add (Ref1 + Ref2)	The sum of the two reference signals is used as the speed given1.	1
Sub （Ref1-Ref2）	The difference of the two reference signals is used as the speed given2.	2
Mul （Ref1xRef2）	The product of the two reference signals is used as the speed given3.	3

21 Speed Reference	Speed Reference	Def
Min	The small one of the two reference signals is used as the speed given4.	4
Max	The big one of the two reference signals is used as the speed given5.	5
Abs	Select the absolute value of Ref6.	6
21.03 Speed ref2 sel	Select the signal source switching between the speed given1 and speed given2. 0: select the speed given1 which is composed by the parameter *21.02 Speed ref func (Speed given operation function);* 1: select the speed given2 which is composed by the parameter *21.01 Speed ref2 src* (*Signal source of speed given2*).	CONST.FALSE= [0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits a set, indicates the parameter set, indexes, Item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI Satus,Position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
21.04 Speed ref share	Define the conversion factor for the speed given value.	1.000
[-10.000, 10.000]	Speed given conversion factor.	
21.05 Speed ref JOG1	Define the speed given value of the jog function1.	150rpm
[-30000rpm, 30000rpm]	The speed given value of the jog function1.	
21.06 Speed ref JOG2	Define the speed given value of the jog function2.	300rpm
[-30000rpm, 30000rpm]	The speed given value of the jog function2.	
21.07 Pot save mode	Select whether to retain the value of the potentiometer when the drive is powered off.	
Reset	The value of the potentiometer will be reset when the drive is powered off.	0
Store	The value of the potentiometer will be retained after the drive is powered off.	1

21 Speed Reference	Speed Reference	Def
21.08 Pot up source	Select the incremental instruction signal source of the electric potentiometer. 0: No incremental instruction; 1: Has incremental instruction. *Refer to parameters 21.03 Speed ref2 sel for relevant available options.*	CONST.FALSE= [0]
21.09 Pot down source	Select the descending instruction signal source of the electric potentiometer. 0: No descending instruction; 1: Has descending instruction. *Refer to parameters 21.03 Speed ref2 sel for relevant available options.*	CONST.FALSE= [0]
21.10 Pot output max	The maximum output of the electric potentiometer.	1500rpm
[0, 30000rpm]		
21.11 Pot output min	The minimum output of the electric potentiometer.	-1500rpm
[-30000rpm, 0rpm]		
21.12 Pot ramp time	The acceleration and deceleration time from the parameter 21.10 to 21.11 for the output of the electric potentiometer.	10.0s
[0.1s, 100.0s]		
21.13 Pot output	The real-time output of the electric potentiometer. Read-only.	
21.14 Slow down spd ref	Up or down speed limits value.	301rpm
[0, 30000]		
21.15 Up slow rqst	Signal source selection of the up deceleration request.	CONST TRUE
21.16 Down slow rqst	Signal source selection of the down deceleration request.	CONST TRUE

22 Speed Ramp(Speed Given Ramp Generator)

22 Speed Ramp	Speed Given Ramp Generator	Def
22.00 Acc time1	Define the acceleration time 1, as the time required for the speed to accelerate from zero to the parameters *19.00 Speed scaling* (velocity reference value) defined value. If the speed of the given signal growth rate is faster than the rate of the acceleration, the motor speed will follow the acceleration rate. If the speed of the given signal growth rate is slower than the set acceleration rate, the motor speed will follow the given signal changes. If acceleration time set too short, the driver will be automatically extended acceleration time, in order to prevent the acceleration current exceeds the set value of the drive torque limit value in the speed up process.	Model correlation
[0.01s, 655.35s]		
22.01 Dec time1	Deceleration time1	Model dependent
[0.01s, 655.35s]		

22 Speed Ramp	**Speed Given Ramp Generator**	Def
22.02 Acc time2	Acceleration time2	Model dependent
[0.01s, 655.35s]		
22.03 Dec time2	Deceleration time2	Model dependent
[0.01s, 655.35s]		
22.04 EM stop time	Emergency stop time	1.00s
[0.01s, 655.35s]		
22.05 Jog acc time	Jog acceleration time	5.00s
[0.01s, 655.35s]		
22.06 Jog dec time	Jog deceleration time	5.00s
[0.01s, 655.35s]		
22.07 Shape acc time1	S Curve acceleration time 1	0.20s
[0.01s, 655.35s]		
22.08 Shape acc time2	S Curve acceleration time 2	0.20s
[0.01s, 655.35s]		
22.09 Shape dec time1	S Curve deceleration time1	0.20s
[0.01s, 655.35s]		
22.10 Shape dec time2	S Curve deceleration time2	0.20s
[0.01s, 655.35s]		
22.11 Speed scaling	Is the same parameter with *19.00 Speed scaling (speed reference value).*	1500rpm
22.12 Ramp time sel	Select the signal source switching between the acceleration deceleration time 1 and the acceleration deceleration time 2. 0: select the acceleration deceleration time 1, 2: select the acceleration deceleration time 2.	CONST.FALSE = [0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI State, Position 0)*	2048
DI2	Digital input DI2	2049

22 Speed Ramp	Speed Given Ramp Generator	Def
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054

23 Speed Control

23 Speed Control	Speed Control	Def
23.00 Speed Kp	Define the proportional gain of the speed controller (K_p). The excessive gain may cause speed oscillation.	1.00
[0.00, 30.00]		
23.01 Speed Ti	Set the integral time of the speed loop.	60ms
[0, 3000ms]		
23.02 Torque Kp	Set the proportional gain of the torque loop.	1.00
[0.00, 30.00]		
23.03 Droop rate	Speed droop control rate used for speed droop control only.	0.0%
[0.0, 1000.0%]		

24 Torque Reference

24 Torque Reference	Torque Reference	Def
24.00 Torque ref1 src	Select the signal source of torque given value 1.	AI1scaled = [515]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set, indicates the parameter set, indexes in turn. The actual value is determined by the current value of the parameter.)	-
Zero	Always zero	0
AI1 scaled	*Refer to parameters of 02.03 AI1 scaled (AI1scaled).*	515
AI2 scaled	*Refer to parameters of 02.05 AI2 scaled (AI2scaled).*	517
AI3 scaled	*Refer to parameters of 02.07 AI3 scaled (AI3scaled).*	519

24 Torque Reference	Torque Reference	Def
Freq in scaled	*Refer to parameters of 02.11 Freq in scaled (Freq in scaled).*	523
Control panel ref1	*Refer to parameters of 02.13 Control panel ref1 (Control panel ref1).*	525
Control panel ref2	*Refer to parameters02.14 Control panel ref2 (Control panel ref 2).*	526
Fieldbus ref1	*Refer to parameters of 02.15 Fieldbus ref1 (Fieldbus ref 1).*	527
Fieldbus ref2	*Refer to parameters of 02.16 Fieldbus ref2 (Fieldbus ref 2).*	528
Const speed out	*Refer to parameters of 03.02Const speed out (Const speed out).*	770
Process PID out	*Refer to parameters of 04.04Process PID out (Process PID out).*	1028
24.01 Torque ref2 src	Select the signal source of torque given value 2. *Refer to parameters 24.00 Torque ref1 src for relevant available options.*	AI2scaled = [517]
24.02 Torque ref func	Define the mathematical function of the two reference signal synthesis torque given value 1 which are selected by the parameters *24.00 Torque ref1 src (signal source of the torque given 1) and 24.01 Torque ref2 src (signal source of the torque given 2).*	Ref1 = [0]
Ref1	The signal selected by *24.00 Torque ref1src* (signal source of *the torque given 1)* is used as the torque given value 1.	0
Add (Ref1 + Ref2)	The sum of the two reference signals is used as the torque given1.	1
Sub （Ref1-Ref2）	The difference of the two reference signals is used as the torque given2.	2
Mul （Ref1xRef2）	The product of the two reference signals is used as the torque given3.	3
Min	The small one of the two reference signals is used as the torque given4.	4
Max	The big one of the two reference signals is used as the torque given5.	5
24.03 Torque ref2 sel	Select the signal source switching between the torque given value 1 and the torque given value 2. 0: select the torque given value 1 composed by the parameter *24.02 Torque ref func (torque given operation function)*; 1: select the torque given value 2 composed by the parameter *24.01 Torquer ef2 src (signal source of the torque given 2).*	CONST.FALSE= [0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, indexes, item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI Status, Position 0)*	2048

24 Torque Reference	Torque Reference	Def
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
24.04 Torque load share	The torque given distribution coefficient.	1.000
[0.000, 10.000]		
24.05 Torque acc time	The torque given acceleration time.	0.10s
[0.00, 655.35s]		
24.06 Torque dec time	The torque given deceleration time.	0.10s
[0.00, 655.35s]		
24.07 Torque filter time	The torque given filtering time.	1ms
[0, 10000ms]		
24.08 Fric Trqstatic	The static friction compensation coefficient, relative to the motor rated torque.	0.0%
[0, 100.0%]		0.1%
24.09 Fric Trqslide	The sliding friction compensation coefficient, relative to the motor rated torque.	0.0%
[0, 100.0%]		0.1%
24.10 Inertial trq	The moment of the inertia compensation coefficient, relative to the motor rated torque.	0.0%
[0, 100.0%]		0.1%

25 Critical Speed

25 Critical Speed	Set critical speed or speed range to be avoided,such as mechanical resonance issues	Def
25.00 Crit speed1 lo	Define the lower limit of the critical speed range 1. Note: this value must be less than or equal to the value of *25.01 Crit speed 1hi* (upper limit of critical speed 1).	0
[0, 30000rpm]	The lower limit of the critical speed 1.	
25.01 Crits peed 1hi	Define the upper limit of the critical speed range 1. Note: this value must be greater than or equal to the value of *25.00 Crit speed 1lo* (lower limit of critical speed 1).	0

25 Critical Speed	**Set critical speed or speed range to be avoided,such as mechanical resonance issues**	Def
[0, 30000rpm]	The upper limit of the critical speed 1.	
25.02 Crit speed 2lo	Define the lower limit of the critical speed range 2. Note: this value must be less than or equal to the value of *25.03 Crit speed 2hi* (upper limit of critical speed 2).	0
[0, 30000rpm]	The lower limit of the critical speed 2.	
25.03 Crit speed 2hi	Define the upper limit of the critical speed range 2. Note: this value must be greater than or equal to the value of *25.02 Crit speed 2lo* (lower limit of critical speed2).	0
[0, 30000rpm]	The upper limit of the critical speed 2.	
25.04 Crits peed 3lo	Define the lower limit of the critical speed range 3. Note: this value must be less than or equal to the value of *25.05 Crit speed 3hi* (upper limit of critical speed 3).	0
[0, 30000rpm]	The lower limit of the critical speed 3.	
25.05 Critspeed3hi	Define the upper limit of the critical speed range 3. Note: this value must be greater than or equal to the value of *25.04 Crit speed 3lo* (lower limit of critical speed 3).	0
[0, 30000rpm]	The upper limit of the critical speed 3.	
25.06 Critspeedsel	Critical speed control	Disable= [0]
Disable	Disable critical speed control.	0
Enable	Enable critical speed control.	1

26 Constant Speeds (Multi-speeds)

26 Constant Speeds	**Selection and value of multi segment velocity**	Def
26.00 Const speed0	Define the multi segment speed 0.	750 rpm
[-30000rpm, 30000rpm]	Multi segment speed 0.	
26.01 Const speed1	Define the multi segment speed 1. For the value range and units and other instructions refer to the parameter *26.00 Const speed0 (Const speed1).*	1500 rpm
26.02 Const speed2	Define the multi segment speed 2. For the value range and units and other instructions refer to the parameter *26.00 Const speed0 (Const speed1).*	1500 rpm
26.03 Const speed3	Define the multi segment speed 3. For the value range and units and other instructions refer to the parameter *26.00 Const speed0 (Const speed1).*	1500 rpm
26.04 Const speed4	Define the multi segment speed 4. For the value range and units and other instructions refer to the parameter *26.00 Const speed0 (Const speed1).*	1500 rpm
26.05 Const speed5	Define the multi segment speed 5. For the value range and units and other instructions refer to the parameter *26.00 Const speed0 (Const speed1).*	0 rpm
26.06 Const speed6	Define the multi segment speed 6. For the value range and units and other instructions refer to the parameter *26.00 Const speed0 (Const speed1).*	0 rpm

<table>
<tr><th>26 Constant Speeds</th><th>Selection and value of multi segment velocity</th><th>Def</th></tr>
<tr><td>26.07 Const speed7</td><td>Define the multi segment speed 7. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.08 Const speed8</td><td>Define the multi segment speed 8. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.09 Const speed9</td><td>Define the multi segment speed 9. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.10 Const speed10</td><td>Define the multi segment speed 10. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.11 Const speed11</td><td>Define the multi segment speed 11. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.12 Const speed12</td><td>Define the multi segment speed 12. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.13 Const speed13</td><td>Define the multi segment speed 13. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.14 Const speed14</td><td>Define the multi segment speed 14. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.15 Const speed15</td><td>Define the multi segment speed 15. For the value range and units and other instructions refer to the parameter 26.00 Const speed0 (Const speed1).</td><td>0 rpm</td></tr>
<tr><td>26.16 Const speed mode</td><td>Define a multi segment 0~15 mode with a total of 4 signals selected by a parameter of 26.18 Const speed sel1 to 26.21 Const speed sel4.</td><td>Packed=[0]</td></tr>
<tr><td>Packed</td><td>4 signal combinations to produce the 16 options, respectively corresponding to the multi segment speed 0~15,the specific combinations are as follows:
<table>
<tr><th>Multi speed option 1</th><th>Multi speed option 2</th><th>Multi speed option 3</th><th>Multi speed option 4</th><th>Multi segment speed selection</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>Const speed0</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>0</td><td>Const speed1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>0</td><td>Const speed2</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>0</td><td>Const speed3</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>0</td><td>Const speed4</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>0</td><td>Const speed5</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>0</td><td>Const speed6</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>0</td><td>Const speed7</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>1</td><td>Const speed8</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>1</td><td>Const speed9</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>1</td><td>Const speed10</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1</td><td>Const speed 11</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>1</td><td>Const speed 12</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>1</td><td>Const speed 13</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>1</td><td>Const speed 14</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td><td>Const speed 15</td></tr>
</table>
If
If you need to use the multi segment speed 0, you need to set the parameter 21.00 spd ref1 src to P03.02 Const speed out.</td><td>0</td></tr>
</table>

<table>
<tr><th>26 Constant Speeds</th><th>Selection and value of multi segment velocity</th><th>Def</th></tr>
<tr><td>Separate</td><td>The 4 signals are used to select the multi segment speed 0~4, among which the priority of the multi segment speed 4 is the highest, and the priority of the multi segment speed 1 is the lowest.. The specific correspondence is as follows：
<table>
<tr><th>Multi speed option1</th><th>Multi speed option2</th><th>Multi speed option3</th><th>Multi speed option4</th><th>Multi segment speed selection</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>Const speed0</td></tr>
<tr><td>1</td><td>x0</td><td>x0</td><td>x0</td><td>Const speed1</td></tr>
<tr><td>x0</td><td>1</td><td>x0</td><td>x0</td><td>Const speed2</td></tr>
<tr><td>x0</td><td>x0</td><td>1</td><td>x0</td><td>Const speed3</td></tr>
<tr><td>x0</td><td>x0</td><td>x0</td><td>1</td><td>Const speed4</td></tr>
</table>
If you need to use the multi segment speed 0, you need to set the parameter 21.00 spd ref1 src to P03.02 Const speed out.</td><td>1</td></tr>
<tr><td>26.17 Const speed out</td><td>Output of the multi segment speed.</td><td>0 rpm</td></tr>
<tr><td>[-30000rpm, 30000rpm]</td><td>Actual output of the multi speed. Read-only.</td><td></td></tr>
<tr><td>26.18 Const speed sel1</td><td>Signal source of the multi segment speed selection 1.
Note: the usage method of the multi segment speed selection 1~4 refer to the parameters 26.16 Constspeed mode (Multi speed mode).</td><td>CONST.FALSE= [0]</td></tr>
<tr><td>P.01.00.00</td><td>User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, indexes, item number in turn. The actual value is determined by the current value of the parameter)</td><td>-</td></tr>
<tr><td>CONST.FALSE</td><td>Always be 0</td><td>0</td></tr>
<tr><td>CONST.TRUE</td><td>Always be 1</td><td>1</td></tr>
<tr><td>DI1</td><td>Digital input DI1 (02.00 DI Status, Position 0)</td><td>2048</td></tr>
<tr><td>DI2</td><td>Digital input DI2</td><td>2049</td></tr>
<tr><td>DI3</td><td>Digital input DI3</td><td>2050</td></tr>
<tr><td>DI4</td><td>Digital input DI4</td><td>2051</td></tr>
<tr><td>DI5</td><td>Digital input DI5</td><td>2052</td></tr>
<tr><td>DI6</td><td>Digital input DI6</td><td>2053</td></tr>
<tr><td>DI7</td><td>Digital input DI7</td><td>2054</td></tr>
<tr><td>26.19 Const speed sel2</td><td>Signal source of the multi segment speed selection 2.
Refer to parameters 26.18 Const speed sel1 for relevant available options.</td><td>CONST.FALSE= [0]</td></tr>
<tr><td>26.20 Const speed sel3</td><td>Signal source of the multi segment speed selection 3.
Refer to parameters 26.18 Const speed sel1 for relevant available options.</td><td>CONST.FALSE= [0]</td></tr>
</table>

26 Constant Speeds	Selection and value of multi segment velocity	Def
26.21 Const speed sel4	Signal source of the multi segment speed selection 4. *Refer to parameters 26.18 Const speed sel1 for relevant available options.*	CONST.FALSE= [0]

27 Process PID

27 Process PID	PID for Process Control	Def
27.00 PID activate	Active the control of the process control PID.	Disable = [0]
Disable	Process control disabled.	0
Enable	Process control activated.	1
27.01 Reference source	Select a given signal source.	P.27.02 = [6914]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter.)	-
Zero	Always zero	0
AI1 scaled	*Refer to parameters of 02.03 AI1 scaled (AI1 scaled).*	515
AI2 scaled	*Refer to parameters of 02.05 AI2 scaled (AI2 scaled).*	517
AI3 scaled	*Refer to parameters of 02.07 AI3 scaled (AI3 scaled).*	519
Freq in scaled	*Refer to parameters of 02.11 Freq in scaled (Freq in scaled).*	523
Control panel ref1	*Refer to parameters of 02.13 Control panel ref1 (Control panel ref 1).*	525
Control panel ref2	*Refer to parameters of 02.14 Control panel ref2 (Control panel ref 2).*	526
Fieldbus ref1	*Refer to parameters 02.15 Fieldbus ref1 (Fieldbus ref 1).*	527
Fieldbus ref2	*Refer to parameters 02.16 Fieldbus ref2 (Fieldbus ref 2).*	528
27.02 Ref internal	Internal digital given for process control.	0
[-32768, 32767]		
27.03 Ref filter time	Given filter time constant.	0.1s
[0.01s, 3.00s]	Filter time constant.	-
27.04 Reference actual	Given actual value. Read-only.	
27.05 Feedback func	Select the operation mode of feedback signal source 1 and feedback signal source 2.	Fbk1 = [0]

27 Process PID	**PID for Process Control**	Def
Fbk1	Select feedback 1 as the actual feedback of PID.	0
Add	Select feedback 1 plus feedback 2 as actual feedback.	1
Sub	Select feedback 1 minus feedback 2 as actual feedback.	2
Min	Select the small value of feedback 1 and feedback 2 as feedback.	3
Max	Select the big value of feedback 1 and feedback 2 as feedback.	4
27.06 Feedback 1 source	Select the signal source of feedback 1. *Refer to parameters 27.01Reference source (given signal source) for relevant available options.*	AI1 scaled = [515]
27.07 Feedback 2 source	Select the signal source of feedback 2. *Refer to parameters 27.01Reference source (given signal source) for relevant available options.*	AI2 scaled = [517]
27.08 Feedback1 max	Set the maximum allowable value of feedback 1.	32767
[-32768, 32767]		
27.09 Feedback1 min	Set the minimum allowable value of feedback 1.	-32768
[-32768, 32767]		
27.10 Feedback2 max	Set the maximum allowable value of feedback 2.	32767
[-32768, 32767]		
27.11 Feedback2 min	Set the minimum allowable value of feedback 2.	-32768
[-32768, 32767]		
27.12 Feedback gain	Feedback gain factor.	1.00
[0.10, 10.00]		
27.13 Fbk filter time	Filter time constant of the feedback.	0.01s
[0.01s, 2.00s]		
27.14 Feedback actual	Actual value of the feedback. Read-only.	
27.15 PID Kp	Proportional gain of PID	1.00
[0.01, 100.00]		
27.16 PID Ti	PID integration time.	1.00s
[0.10s, 20.00s]		

27 Process PID	**PID for Process Control**	Def
27.17 PID Td	PID differential time.	0.00s
[0.00s, 20.00s]		
27.18 Deriv filter time	Filtering time of differential quantity.	1.00s
[0.01s, 20.00s]		
27.19 Error invert sel	Error is selected by the reverse mode.	Disable = [0]
Disable	Disable reverse,i.e. the feedback increases,output decreases.	0
Enable	Enable reverse. i.e. the feedback increases, the output also increases.	1
27.20 output trim mode	Format the output.	Direct = [1]
Direct	The output is not converted.	0
Speed	The output is converted into the speed dimension.	1
Torque	The output is converted into the torque dimension.	2
27.21 Out max	The maximum allowable value of PID output.	1500
[-32768, 32767]		
27.22 Out min	The minimum allowable value of PID output.	-1500
[-32768, 32767]		
27.23 Bal enable sel	Balanced control enable signal.	Disable = [0]
Disable	Balance control disable.	0
Enable	Balance control enabled.	1
27.24 Bal ref	Qualification of balance control.	0
[-32768, 32767]		
27.25 Sleep mode	Hiberation mode.	No sleep= [0]
No sleep	Process control never goes to hiberation mode.	0
Sleep internal	Process control enable hiberation externally.	1
Sleep external	Process control enable hiberation by external signal, and will be triggered when the actual speed is less than the value of the following clause of 27.26.	2

27 Process PID	**PID for Process Control**	Def
Sleep by error	Enable hiberation when the deviation is less than the value of the following clause of 27.28.	3
27.26 Sleep level	Motor speed level triggered by PID hiberation.	900
[-32768, 32767]		
27.27 Sleep delay	Delay time of PID hiberation.	60.0s
[0.0, 6553.5s]		
27.28 Wakeup level	The error level of PID wake up. Wake up when the PID error is greater than the value.	1000
[-32768, 32767]		
27.29 Wakeup delay	PID wake up delay time after hiberation.	1.0s
[0.0, 6553.5s]		
27.30 Sleep enable sel	Selection of PID sleep external enable signal source. Bit pointer.	CONST.FALSE= [0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0.	0
CONST.TRUE	Always be 1.	1
DI1	Digital input DI1 (02.00 DI Status, Position 0)	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
27.31 Calc enable sel	Select the signal source of PID operation enable.	Running = [6148]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0

27 Process PID	PID for Process Control	Def
CONST.TRUE	Always be 1	1
27.32 Feedback loss mode	Detection mode of PID feedback disconnection.	Internal = [2]
Disable	No detection.	0
External	Detection by external terminal input.	1
Internal	Detection by judging the PID error.	2
27.33 Fbk loss min speed	The minimum speed of the PID feedback disconnection detection.	30.0rpm
[0, 3000.0rpm]		0.1rpm
27.34 Fbk losssrc	Select the input terminal for the external feedback missing signal. *Refer to parameters 27.30 Sleep enable sel (Dormant enable signal source) for relevant available options.*	False
27.35 Fbk losslevel	The error judgment level of PID feedback disconnection.	3000
[0, 30000]		-
27.36 Fbk loss delay	PID feedback disconnection fault delay.	2.0s
[0, 60.0s]		0.1s

29 Timer Function

<table>
<tr><th>29 Timer Function</th><th>Timer Function Setting</th><th>Def</th></tr>
<tr><td>29.00 Timer enable</td><td>Activation the timer.</td><td>Disable = [0]</td></tr>
<tr><td>Disable</td><td>Timer not activated.</td><td>0</td></tr>
<tr><td>Enable</td><td>Timer is activated.</td><td>1</td></tr>
<tr><td>29.01 Timer status</td><td>The state word of the timer can be directed to the parameter by the pointer to achieve a specific timing function.
<table>
<tr><th>Position</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>Timer1compare</td><td>Timer 1 compare trigger</td></tr>
<tr><td>1</td><td>Timer2 compare</td><td>Timer 2 compare trigger</td></tr>
<tr><td>2</td><td>Timer3 compare</td><td>Timer 3 compare trigger</td></tr>
<tr><td>3</td><td>Timer1 period</td><td>Timer 1 cycle trigger</td></tr>
<tr><td>4</td><td>Timer2 period</td><td>Timer 2 cycle trigger</td></tr>
<tr><td>5</td><td>Timer3 period</td><td>Timer 3 cycle trigger</td></tr>
</table></td><td></td></tr>
<tr><td>29.02 Timer1 period</td><td>Cycle of the Timer 1. Unit is minute.</td><td>1.0min</td></tr>
<tr><td>[0.1min, 6553.5min]</td><td></td><td></td></tr>
<tr><td>29.03 Timer1 duty</td><td>Duty cycle of the Timer 1. Unit is percentage.</td><td>50.0%</td></tr>
</table>

29 Timer Function	**Timer Function Setting**	Def
[0.0%, 100.0%]		
29.04 Timer2 period	Cycle of the Timer 2. Unit is minute.	1.0min
[0.1min, 6553.5min]		
29.05 Timer2 duty	Duty cycle of the Timer 2. Unit is percentage.	50.0%
[0.0%, 100.0%]		
29.06 Timer3 period	Cycle of the Timer 3. Unit is minute.	1.0min
[0.1min, 6553.5min]		
29.07 Timer3 duty	Duty cycle of the Timer 3. Unit is percentage.	50.0%
[0.0%, 100.0%]		
29.08 long period	For long cycle mode, the unit of the timer cycle is minute; for short cycle mode, the unit of the timer cycle is second.	Disable
Disable	Short cycle mode, Second.	0
Enable	Long cycle mode, Minute.	1

30 Fault function

30 Fault function	Fault Protection Function Setting	Def
30.00 Ext fault 1 src	Select the signal source for the external fault 1. 0: No fault signal source; 1: Has fault signal source.	CONST.FALSE=[0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI Status, Position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
30.01 Ext fault 2 src	Select the signal source for the external fault 2. Refer to parameters *30.00 Ext fault 1 src (signal source of external fault 1).*	CONST.FALSE= [0]
30.02 Groud fault act	Select the action to be performed by the drive when a ground fault is detected.	Fault = [1]
No action	No action.	0
Fault	Report fault.	1
Alarm	Report alarm.	2
30.03 Input phase loss	Select the action to be performed by the drive when an input phase fault is detected.	Fault = [1]
No action	No action.	0
Fault	Report fault.	1
Alarm	Report alarm.	2
30.04 Motor phase loss	Select the action to be performed by the drive when a motor phase fault is detected.	Fault = [1]
No action	No action.	0
Fault	Report fault.	1

30 Fault function	**Fault Protection Function Setting**	Def
Alarm	Report alarm.	2
30.05 STO action	Activate or disable the security torque interrupt protection function by this parameter.	Enable = [1]
Disable	Disable the security torque interrupt protection function.	0
Enable	Enable the security torque interrupt protection function.	1
30.06 OH alarm level	Setting the IGBT radiator overheating warning point. When the set overheating warning point exceeds the allowable temperature of the drive, it will ignore the parameter and automatically warn at 5 degrees ahead of the overheating.	90.0℃
[40.0℃, 120.0℃]	Overheat warning temperature point.	
30.07 Fault auto reset	Activate or disable the fault automatic reset function by this parameter.	Disable = [0]
Disable	Disable the fault automatic reset function.	0
Enable	Enable the fault automatic reset function.	1
30.08 Fault trial num	Number of times a fault reset trying is allowed.	5
[1, 20]		-
30.09 Fault trial wait	Interval time of fault reset.	1.00s
[0.01s, 150.00s]		
30.10 Trial cnt reset	Time interval for fault reset trying to clear the counter.	60.00s
[0.01s, 150.00s]		
30.11 ChopIGBT fault act	Action to be performed when the brake IGBT fails.	Fault
None	No action.	0
Fault	Fault output.	1
Alarm	Alarm output.	2
30.12 Rb est	Resistance estimated by the system. Read-only.	-
30.13 Br thermal enable	Brake resistance thermal protection enable.	Disable
Disable	Turn off.	0
Enable	Enable resistance thermal protection.	1
30.14 Br temp est	Estimated value of the temperature rise of the braking resistor. Read-only.	-

30 Fault function	Fault Protection Function Setting	Def
30.15 Br max power	Set the rated power of the braking resistor.	2.0kW
[0, 3000.0kW]		0.1kW
30.16 Br time constant	Set the thermal time constant of the braking resistor.	60.0 s
[0.1s, 3000.0s]		0.1s
30.17 Br temp rise	Set the rated temperature rise of the braking resistor.	60.0℃
[0.0s, 300.0s]		0.1℃
30.18 Br fault level	Set the overheat fault point of the braking resistor.	150.0℃
[0.0, 300.0℃]		0.1℃
30.19 Br alarm level	Set the overheat alarm point of the braking resistor.	120.0℃
[0.0, 300.0℃]		0.1℃

31 Motor Therm Prot

31 Motor Therm Prot	Motor temperature measurement and overheat protection set up	Def
31.00 Protect action	Select the action to be performed by the driver when the motor thermal protection 1 detects the over temperature of the motor.	Fault = [1]
No	Motor thermal protection is not activated.	0
Fault	When the temperature is above the alarm / fault level defined by the parameters *31.02 Alarm limit* (Motor temperature alarm value)*/31.03 Fault limit* (Motor temperature fault value) (whichever is lower), The drive will generate a MOTOROH alarm or a MOTOROH fault and trip off. The temperature sensor failure or wiring errors will cause the driver to trip off.	1
Alarm	When the motor temperature exceeds the alarm limit defined by the parameters *31.02 Alarm limit* (Motor temperature alarm value), the drive will generate a MOTOR OH alarm.	2
31.01 Temperature src	Select the temperature measurement method for the motor thermal protection. When the overheating is detected, the drive will react in accordance with the method defined by the parameters *31.00 Protect action* (Motor over temperature protection).	Estimated = [0]

31 Motor Therm Prot	**Motor temperature measurement and overheat protection set up**	Def
Estimated	The monitoring temperature based on the motor thermal protection model which uses the thermal time constant of the motor (parameter *31.14Mot therm time* (thermal protection time constant)) and the motor load curve (parameter *31.10*...*31.12*) . Only when the operating ambient temperature is different from the rated operating temperature of the motor, user need to adjust the relevant parameters. If the motor runs above the motor load curve, the motor temperature will increase. If the motor runs under the motor load curve (if the motor is overheated), the motor temperature will be reduced. Warning! If the the motor is not properly cooled due to the dust, the model can not perform the protection function to the motor.	0
KTY84	The motor temperature is monitored by the KTY84 temperature sensor.	1
PTC	The motor temperature is monitored by the PTC sensor.	2
PT100_X1	Monitoring by a PT100 sensor.	3
PT100_X2	Monitoring by two PT100 sensors.	4
PT100_X3	Monitoring by three PT100 sensors.	5
31.02 Alarm limit	Set the motor temperature warning point.	120.0℃
[0.0℃, 200.0℃]	Motor temperature warning point.	
31.03 Fault limit	Set motor temperature fault point.	130.0℃
[0.0℃, 200.0℃]	Motor temperature fault point.	
31.04 Ambient temp	Set the actual operating ambient temperature of the motor.	40.0℃
[0.0℃, 90.0℃]	Ambient temperature of the motor.	
31.05 Motor nom load	When the parameters *31.01Temperature src* (Signal source of motor temperature) is set as *Estimated (Estimated value)*, the heating model of the motor will use the load curve.	110.0%
[50.0%, 200.0%]	Maximum load of the motor load curve.	
31.06 Zero speed load	Define the maximum motor load when the load curve is zero. If the motor is equipped with an external fan to enhance the ventilation cooling of the motor, a greater load may be used. Refer to the motor manufacturer's recommendations.	70.0%
[50.0%, 100.0%]	Zero load of the motor load curve.	
31.07 Motor nom speed	Define the inflection frequency of the load curve, i.e. the load on the load curve defined by the value of the parameter *31.05 Nominal load* (Rated speed load) begins to drop to the value defined by the parameter *31.06 Zero speed load* (Zero speed load).	1500rpm
[150rpm, 30000rpm]	The speed inflection point of the motor load curve.	

31 Motor Therm Prot	Motor temperature measurement and overheat protection set up	Def
31.08 Motor nom temp rise	When the load of the motor reaches the rated current, define the temperature rise of the motor. Refer to the motor manufacturer's recommendations. When the parameters *31.01Temperature src* (Signal source of motor temperature) is set as *Estimated (Estimated value)*, the heating model of the motor will use the load curve.	60.0℃
[10.0℃, 200.0℃]	Temperature rise of the motor rated load.	
31.09 Therm time const	Defining the thermal time constant of the motor thermal protection model (i.e. the time that the temperature rise to the 60% of the rated temperature rise 63%). Refer to the motor manufacturer's recommendations.	1800.0s
[10.0s, 1800.0s]	Motor thermal time constant.	
31.10 External cool fan	For the variable frequency asynchronous motor or the synchronous motor, the cooling fan is independent, then the load capacity of zero speed is the same as that of the rated speed. For the non variable frequency motor, the motor comes with the fan and coaxial with the rotor, then need to be set to Auto cool. The correct setting is the premise of accurate temperature estimation.	Externalcool = [0]
Auto cool	Non variable frequency motor. The load capacity of zero speed is lower than that of the rated speed.	0
External fan	External independent fan. The load capacity of zero speed is the same as that of the rated speed.	1
31.11 Sensor input sel	The signal input channel of the temperature sensor. Be sure to change the corresponding jump line of the terminal board to voltage type input.	AI1 = [0]
AI1	The temperature sensor is connected to the analog input AI1.	0
AI2	The temperature sensor is connected to the analog input AI2.	1
AI3	The temperature sensor is connected to the analog input AI3.	2
31.12 Sensor bias out	The selection of bias current source for the temperature sensor. Be sure to change the corresponding jump line of the terminal board to current type output.	AO1 = [0]
AO1	The temperature sensor is connected to the analog output AO1.	0
AO2	The temperature sensor is connected to the analog output AO2.	1

32 Factory Setting

32 Factory Setting	Optimization of the factory configuration of the kernel factory configuration settings (Default value	Def
32.04 Kp_vdc_max	Proportional gain of the overvoltage stall controller,Q12.	4096

32 Factory Setting	**Optimization of the factory configuration of the kernel factory configuration settings (Default value**	Def
[2048, 16384]		1
32.05 Ki_vdc_max	Integral gain of the overvoltage stall controller, Q16.	1638
[419, 16384]		1
32.06 Kp_vdc_max_f	Proportional gain of the overvoltage stall frequency controller, Q12.	4096
[2048, 16384]		1
32.07 Ki_vdc_max_f	Integral gain of the overvoltage stall frequency controller, Q16.	1638
[419, 16384]		1
32.08 Kp_fctrl	Proportional gain of the open loop frequency controller, Q12.	2048
[819, 16384]		1
32.09 Kp_vctrl	Proportional gain of the open loop voltage controller, Q12.	2048
[819, 16384]		1
32.10 AI1 gain	Analog input AI1 correction gain, Q12	4096
[2048, 8192]		1
32.11 AI1 offset	Analog input AI1 corrected offset, 1mV or 1mA	0
[-200, 200]		1mV/1mA
32.12 AI2 gain	Analog input AI2 correction gain, Q12	4096
[2048, 8192]		1
32.13 AI2 offset	Analog input AI2 corrected offset, 1mV or 1mA	0
[-200, 200]		1mV/1mA
32.14 AI3 gain	Analog input AI3 correction gain, Q12	4096
[2048, 8192]		1
32.15 AI3 offset	Analog input AI3 corrected offset, 1mV or 1mA	0
[-200, 200]		1mV/1mA
32.16 AO1 gain	Analog output AO1 correction gain, Q12	3805

32 Factory Setting	Optimization of the factory configuration of the kernel factory configuration settings (Default value	Def
[2048, 8192]		1
32.17 AO1 offset	Analog output AO1 corrected offset, 1mV or 1mA	45mV
[-200, 200]		1mV/1mA
32.18 AO2 gain	Analog output AO2 correction gain, Q12	3805
[2048, 8192]		1
32.19 AO2 offset	Analog output AO2 corrected offset, 1mV or 1mA	45mV
[-200, 200]		1mV/1mA

33 Signal Generator

33 Signal Generator	Signal Generator Setting	Def
33.00 Signal generator enable	Enable or disable signal generator function.	Enable = [1]
Disable	Disable. Can reduce the CPU load.	0
Enable	Enable.	1
33.01 Signal waveform	Select the output signal waveform.	Sinusoid = [0]
Sinusoid	Output sine wave of the signal generator.	0
Trapezoid	Output trapezoidal wave of the signal generator.	1
33.02 Signal output	Current output value of the monitoring signal. Note: this parameter is read – only. This parameter can be connected by a pointer.	0
[-32768,32767]		-
33.03 Maxoutput	Set the maximum output value of the signal.	1500
[-32768,32767]		-
33.04 Min output	Set the minimum output value of the signal.	-1500
[-32768,32767]		-
33.05 Sinusoid period	Set the signal cycle of the sine wave, Unit is 1ms.	3000 ms
[8,30000]		-

33 Signal Generator	Signal Generator Setting	Def
33.06 Traperise time	Set the rise time of the trapezoidal wave from low level to high level, Unit is 1ms.	6000 ms
[1,60000]		-
33.07 Trape fall time	Set the fall time of the trapezoidal wave from high level to low level, Unit is 1ms.	6000ms
[1,60000]		-
33.08 Trape high time	Set the duration of the trapezoidal wave high level, Unit is 0.01s.	1.00 s
[0.01,600.00]		-
33.09 Trape low time	Set the duration of the trapezoidal wave low level, Unit is 0.01s.	1.00 s
[0.01,600.00]		-

34 Logic Function

<table>
<tr><th>34 Logic Function</th><th>Edge counters, comparators, combinational logic, timers and other functions setting</th><th>Def</th></tr>
<tr><td>34.00 Logic status</td><td>Can be connected to any bit of the status word by a bit pointer.
<table>
<tr><th>No</th><th>Name</th><th>Describption</th></tr>
<tr><td>0</td><td>Edge1</td><td>Edge counter 1 output.</td></tr>
<tr><td>1</td><td>Edge2</td><td>Edge counter 2 output.</td></tr>
<tr><td>2</td><td>Edge3</td><td>Edge counter 3 output.</td></tr>
<tr><td>3</td><td>Comp1</td><td>Comparator 1 output.</td></tr>
<tr><td>4</td><td>Comp2</td><td>Comparator 2 output.</td></tr>
<tr><td>5</td><td>Comp3</td><td>Comparator 3 output.</td></tr>
<tr><td>6</td><td>Logic1</td><td>Logic 1 function output.</td></tr>
<tr><td>7</td><td>Logic2</td><td>Logic 2 function output.</td></tr>
<tr><td>8</td><td>Logic3</td><td>Logic 3 function output.</td></tr>
<tr><td>9</td><td>Ontime1</td><td>Timer 1 output.</td></tr>
<tr><td>10</td><td>Ontime2</td><td>Timer 2 output.</td></tr>
<tr><td>11</td><td>Ontime3</td><td>Timer 3 output.</td></tr>
<tr><td>12~15</td><td>Reserved</td><td>Retain</td></tr>
</table></td><td></td></tr>
<tr><td>34.01 Edge cnt1 val</td><td>Monitor the count value of the edge counter. Note that this parameter is read – only.</td><td>0</td></tr>
<tr><td>[0, 65535]</td><td></td><td>-</td></tr>
<tr><td>34.02 Edge cnt1 src</td><td>Select the count signal source for the edge counter 1. when the specified edge of the signal is detected, the counter plus 1.</td><td>CONST.FALSE= [0]</td></tr>
<tr><td>P.01.00.00</td><td>User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter.)</td><td>-</td></tr>
<tr><td>CONST.FALSE</td><td>Always be 0</td><td>0</td></tr>
<tr><td>CONST.TRUE</td><td>Always be 1</td><td>1</td></tr>
</table>

34 Logic Function	Edge counters, comparators, combinational logic, timers and other functions setting	Def
DI1	Digital input DI1 *(02.00 DI Status, Position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
34.03 Edge cnt1 reset	Select the reset signal source for the edge counter 1. When the signal is 1, the counter is cleared to 0. *Refer to parameters 34.02 Edge cnt1 src (count signal source of edge counter 1) for relevant available options.*	CONST.FALSE= [0]
34.04 Edge cnt1 edge	Select the count edge of the edge counter 1.	Rising = [0]
Rising	Counting for the rising edge of the count signal.	0
Falling	Counting for the falling edge of the count signal.	1
Both	Counting for the rising and falling edges of the count signal.	2
34.05 Edge cnt1 duty	Set the duty cycle of the edge counter 1. The output of the edge counter is monitored by the *parameter of 34.00 Logic status (Logical state) Bit 0.* When the count value is less than the duty cycle, the output is 0; otherwise, the output is 1.	100
[0,65535]		-
34.06 Edge cnt1 period	Set the count cycle for the edge counter 1. Note that the period of the edge counter should not be less than its duty cycle.	120
[0,65535]		-
34.07 Edge cnt1 clear	Enable or disable the clear mode of the edge counter 1 .	Disable = [0]
Disable	Disable clear mode, clear when the count value exceeds the maximum value of 65535.	0
Enable	Enable clear mode, clear automatically when the count value reaches the cycle value.	1
... …	…	…
34.15 Edge cnt3 val	Monitor the count value of the edge counter 3. The value range and units and other instructions refer to the parameter *34.01 Edge cnt1 val (count value of edge counter 1).*	0
34.16 Edge cnt3 src	Select the count signal source of the edge counter 3. *Refer to parameters 34.02 Edge cnt1 src (count signal source of edge counter 1) for relevant available options.*	CONST.FALSE = [0]
34.17 Edge cnt3 reset	Select the reset signal source of edge counter 3. *Refer to parameters 34.02 Edge cnt1 src (count signal source of edge counter 1) for relevant available options.*	CONST.FALSE = [0]

34 Logic Function	**Edge counters, comparators, combinational logic, timers and other functions setting**	Def
34.18 Edge cnt3 edge	Select the count value of the edge counter 3. The value range and units and other instructions refer to the parameter *34.04 Edge cnt1 edge (count edge of edge counter 1)* for relevant available options.	Rising = [0]
34.19 Edge cnt3 duty	Set the duty cycle of the edge counter 3. The value range and units and other instructions refer to the parameter *34.05 Edge cnt1 duty (duty cycle of edge counter 1).*	100
34.20 Edge cnt3 period	Set the cycle of the edge counter 3. The value range and units and other instructions refer to the parameter *34.06 Edge cnt1 period (cycles of edge counter 1).*	120
34.21 Edge cnt3clear	Enable or disable the clear mode of the edge counter 3. *Refer to parameters 34.07 Edge cnt1 clear (Edge counter 1 clear) for relevant available options.*	
34.22 Comp1 output	Monitor the output of the comparator 1. Note that this parameter is read only. The output of the comparator 1 is also available for checking in the parameter *34.00 Logic status (Logical state)* Bit 3.	0
[0,1]	The comparator using the hysteresis comparison mode by default. The hysteresis size Δ is determined by the parameter *34.25 Comp1 range (comparison range of Comparator 1).* Initially, the comparator output is 0, when the input A decreased to less than or equal to B-Δ, the output is reversed to 0; when the input A increased to greater than or equal to the input B+Δ, the output is reversed to 1. Enable the window comparison mode by the parameter *34.28 Comp1 win (window mode of comparator 1),* the window size Δ is also determined by the parameter *34.25 Comp1 range (comparison range of comparator 1).* When the inputA is not less than B- Δ and no greater than the input B+ Δ, the output is 1, otherwise the output is 0.	-
34.23 Comp1 A src	Select the input A signal source comparator 1.	Zero= [0]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter.)	-
Zero	Always zero.	0
34.24 Comp1 B val	Set the value of the comparator 1 to input B.	120
[-32767,32767]		-
34.25 Comp1 range	Set the comparison range of comparator 1.	20
[-32767,32767]		
34.26 Comp1in abs	Enable or disable taking the absolute value of the comparator 1 to input A.	Disable = [0]
Disable	Disable	0
Enable	Enable	1
34.27 Comp1out inv	Enable or disable to reverse the output of comparator 1. *Refer to parameters 34.26 Comp1 in abs (take input absolute value of Comparator 1) for relevant available options.*	Disable = [0]
34.28 Comp1 win	Enable or disable the window comparison mode of comparator 1. *Refer to parameters 34.26 Comp1 in abs (take input absolute value of Comparator 1) for relevant available options.*	Disable = [0]

34 Logic Function	Edge counters, comparators, combinational logic, timers and other functions setting	Def
		…
34.36 Comp3 output	Monitor the output of comparator 3. The value range and units and other instructions refer to the parameter *34.22 Comp1 output (comparator 1 output).*	0
34.37 Comp3 A src	Select the signal source of comparator 3 to input A. *Refer to parameters 34.23 Comp1 A src (signal source of comparator 1 input A) for relevant available options.*	Zero= [0]
34.38 Comp3 B val	Set the value of comparator 3 to input B. The value range and units and other instructions refer to the parameter *34.24 Comp1B val (the value of the comparator 1 input B).*	100
34.39 Comp3 range	Set the comparison range of comparator 3. The value range and units and other instructions refer to the parameter *34.25 Comp1 range (comparison range of comparator 1).*	20
34.40 Comp3 in abs	Enable or disable the absolute value of comparator 3 input A. *Refer to parameters 34.26 Comp1 in abs (comparison range of comparator 1) for relevant available options.*	Disable = [0]
34.41 Comp3 out inv	Enable or disable the output of comparator 3. *Refer to parameters 34.26 Comp1 in abs (input absolute value of comparator 1) for relevant available options.*	Disable = [0]
34.42 Comp3 win	Enable or disable the window comparison mode of comparator 3. *Refer to parameters 34.26 Comp1 in abs (input absolute value of comparator 1) for relevant available options.*	Disable = [0]
34.43 Logic1 A src	Select the signal source of logic 1 input A.	CONST.FALSE= [0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter.)	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital input DI1 *(02.00 DI State,Position 0)*	2048
DI2	Digital input DI2	2049
DI3	Digital input DI3	2050
DI4	Digital input DI4	2051
DI5	Digital input DI5	2052
DI6	Digital input DI6	2053
DI7	Digital input DI7	2054
34.44 Logic1 B src	Select the signal source of logic 1 input B. *Refer to parameters 34.43 Logic1 A src (signal source of Logic 1 input A) for relevant available options.*	CONST.FALSE= [0]

34 Logic Function	**Edge counters, comparators, combinational logic, timers and other functions setting**	Def
34.45 Logic1 C src	Select the signal source of logic 1 input B. *Refer to parameters 34.43 Logic1 A src (signal source of Logic 1 input A) for relevant available options.*	CONST.FALSE= [0]
34.46 Logic1 func	Selection the function of logic 1, that is, the logical operation. A, B, C, the three input signals in accordance with the specified logic operators forms the combination logic. The output of Logic 1 is monitored by parameter *34.00 Logic status (Logical state) Bit 6.*	AND = [0]
AND	Logic and	0
OR	Logic or	1
NOT	Logic non	2
XOR	Logic exclusive or	3
Toggle	Logic reverse	4
NAND	Logic and non	5
...	…	…
34.51 Logic3 A src	Set the signal source of logic 3 input A . *Refer to parameters34.43Logic1A src(Logic 1 input A signal source)for relevant available options.*	CONST.FALSE= [0]
34.52 Logic3 A src	Set the signal source of logic 3 input B. *Refer to parameters34.43Logic1A src(Logic 1 input A signal source)for relevant available options.*	CONST.FALSE= [0]
34.53 Logic 3 A src	Set the signal source of logic 3 input C. *Refer to parameters34.43Logic1A src(Logic 1 input A signal source)for relevant available options.*	CONST.FALSE= [0]
34.54 Logic 3 func	Selection the function of logic 3, i.e. the logical operator. *Refer to parameters34.46Logic1func(Logical 1 function)for relevant available options.*	AND = [0]
34.55 Ontime1 enable src	Select the enable signal source of the timer 1. When the enable signal is equal to 0, timer stops; When the enable signal is equal to 1, timer starts.	CONST.FALSE= [0]
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn.The actual value is determined by the current value of the parameter).	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital inputDI1*(02.00 DI state,position0)*	2048
DI2	Digital inputDI2	2049
DI3	Digital inputDI3	2050
DI4	Digital inputDI4	2051
DI5	Digital inputDI5	2052
DI6	Digital inputDI6	2053

34 Logic Function	Edge counters, comparators, combinational logic, timers and other functions setting	Def
DI7	Digital inputDI7	2054
34.56 Ontime1 comp val	Set the comparison value of timer 1， Units as 0.1s.Timer 1 output by parameter*34.00Logic status(Logical state)Bit 9 monitoring*,When the count value is less than the comparison value， The output is 0,otherwise,The output is 1.	6553.5 s
[0.0, 6553.5]		
34.57 Ontime 1 cnt	Monitor timer 1 count value.Notice, this parameter is read – only.	0
[0, 65535]		-
... …	…	…
34.61 Ontime3 enable src	Select the enable signal source of timer 3. *Refer to parameters 34.55 Ontime1 enable src (The timer 1 lose enabling signal source) for relevant available options.*	CONST.FALSE= [0]
34.62 Ontime3 comp val	Set the comparison value of timer 3. The value range and units and other instructions refer to the parameter *34.56 Ontime1comp val(Comparison value of timer 1).*	6553.5 s
34.63 Ontime 3 cnt	Monitor the count value of timer 3. The value range and units and other instructions refer to the parameter *34.57 Ontime1cnt(Timer 1 count value).*	0

35 Math function

35 Math function	Linear scaling、Arithmetic expression、integrator、Filter and other functions set up	Def
35.00 Linear 1 x src	Select the signal source of retiomatric conversion 1 input X.	Zero = [0]
P.01.00	User-defined pointer (01.00 from left to right take two digits a set, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter).	-
Zero	Always zero	0
35.01 Linear1 y	Set the value of the retiomatric conversion 1 output y. Note this parameter is read only. User can connect to the parameters by a pointer.	0
[-32767,32767]		-
35.02 Linear1 x max	Set and select the maximum value of the ratiometric conversion input X.	32767
[-32767,32767]		-
35.03 Linear1 x min	Set and select the minimum value of the ratiometric conversion input X.	0
[-32767,32767]		-

35 Math function	**Linear scaling、Arithmetic expression、integrator、Filter and other functions set up**	Def
35.04 Linear1 y max	Set and select the maximum value of the ratiometric conversion output Y.	32767
[-32767,32767]		-
35.05 Linear1 y min	Set and select the minimum value of the ratiometric conversion output Y.	0
[-32767,32767]		-
35.06 Linear 1 x abs	Enable or disable the absolute value of the ratiometric conversion 1 input X.	Disable = [0]
Disable	Disable	0
Enable	Enable	1
35.07 Linear1 y dec	Set the decimal digits of the ratiometric conversion output Y.	0
[0, 7]		-
35.08 Linear1 y unit	Select the unit of the ratiometric conversion 1 output Y.	0
[0, 63]		-
... …	…	…
35.18 Linear 3 x src	Select the signal source of the ratiometric conversion 3 input X. *Refer to parameters35.00Linear1 x src(Proportional conversion 1 input X signal source)for relevant available options.*	Zero = [0]
35.19 Linear 3 y	Value of the ratiometric conversion 3 output Y. The value range and units and other instructions refer to the parameter *35.01 Linear1 output(Ratio conversion 1 output y value).*	0
35.20 Linear 3 x max	Set the maximum value the ratiometric conversion 3 input X. The value range and units and other instructions refer to the parameter *35.02 Linear1 x max(Proportional conversion 1 input x maximum).*	32767
35.21 Linear3 x min	Set the minimum value the ratiometric conversion 3 input X. The value range and units and other instructions refer to the parameter *35.03 Linear1 x min(Proportional conversion 1 input x minimum value).*	0
35.22 Linear3 y max	Set the maximum value the ratiometric conversion 3 input Y. The value range and units and other instructions refer to the parameter *35.04 Linear1 y max(Proportional conversion 1 output y maximum value).*	32767
35.23 Linear3 y min	Set the minimum value the ratiometric conversion 3 input Y. The value range and units and other instructions refer to the parameter *35.06Linear1 y min(Proportional conversion 1 input yminimum value).*	0
35.24 Linear3 x abs	Enable or disable the absolute value of the ratiometric conversion 3 input X.	Disable = [0]
35.25 Linear3 y dec	Set the decimal digits of the ratiometric conversion 3 output Y.	0
35.26 Linear3 y unit	Select the unit of the ratiometric conversion 3 output Y.	0

35 Math function	Linear scaling、Arithmetic expression、integrator、Filter and other functions set up	Def
35.27 Math1 x src	Select the signal source of arithmetic 1 input X.	Zero = [0]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set, indicates the parameter set,, index in turn. The actual value is determined by the current value of the parameter).	-
Zero	Always zero	0
35.28 Math1 y src	Select the signal source of arithmetic 1 input Y.*Refer to parameters 35.27Math1 x src(Arithmetic 1 input X signal source)for relevant available options.*	Zero = [0]
35.29 Math1 func	Select the function of arithmetic 1, i.e. the arithmetic operator. Input X and Y in accordance with the specified arithmetic operator to form an arithmetic expression.	Add = [0]
Add	x + y	0
Sub	x - y	0
Min	The small one of X and Y	0
Max	The big one of X and Y	0
Abs	Absolute value of X	0
Mul	x * y / k(k is a scaling factor)	0
Div	X * k / y(k is a scaling factor)	0
35.30 Math 1 factor	When the parameter *35.29 Math1 func(Function of arithmetic1)*select multiply or divide as an arithmetic operator, set the scaling factor k of arithmetic 1.	0
[-32768,32767]		-
35.31 Math1 output	Monitor the output of arithmetic 1. Note that this parameter is read – only. It can be connected to the parameter by a pointer.	0
[-32768,32767]		-
... …	…	…
35.37 Math 3 x src	Select the signal source of arithmetic 3 input X. *Refer to parameters35.27Math1 x src(Arithmetic 1 input X signal source)for relevant available options.*	Zero = [0]
35.38 Math3 y src	Select the signal source of arithmetic 3 input Y. *Refer to the parameters35.27Math1 x src(Arithmetic 1 input X signal source)for relevant available options.*	Zero = [0]
35.39 Math 3 func	Select the function of arithmetic 1, i.e. the arithmetic operator. *Refer to parameters35.29Math1 func(Function of arithmetic 1)for relevant available options.*	Add = [0]
35.40 Math 3 factor	When parameters *35.39Math3func(Function of arithmetic 3)*select multiply or divide as an arithmetic operator, set the scaling factor k of arithmetic 3.	0

35 Math function	**Linear scaling、Arithmetic expression、integrator、Filter and other functions set up**	Def
35.41 Math 3 output	Monitor the output of arithmetic 3. Note that this parameter is read – only. It can be connected to the parameter by a pointer.	0
35.42 Integrator1src	Select the signal source of integrator1 input. *Refer to parameters35.27Math1 x src(Arithmetic 1 input X signal source)for the relevant available options.*	Zero = [0]
35.43 Integrator 1 output	Monitor the output of integrator 1. Note that this parameter is read – only. It can be connected to the parameter by a pointer.	0
[0, 65535]		-
35.44 Integrator1scaling		0
[0, 65535]		-
……	…	…
35.48 Integrator3src	Select the signal source of integrator3 input. *Refer to parameters35.42Integrator1 src(1 input signal source integrator)for relevant available options.*	
35.49 Integrator3output	Monitor the output of integrator 3. It can be connected to the parameter by a pointer.	
35.50 Integrator3scaling		
35.51 Filter1 input src	Select the signal source of a low pass filter 1 input.	Zero = [0]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter).	-
Zero	Always zero	0
35.52 Filter1 output	Monitor the output of the low pass filter 1. Note that this parameter is read – only. It can be connected to the parameter by a pointer.	0
[0, 65535]		-
35.53 Filter1 timeconst	Set the filter time constant of low pass filter 1. Unit is 0.01s.	1.00 s
[0.00, 655.35]		-
……	…	…
35.57 Filter3 input src	Select the signal source of a low pass filter 3 input. *Refer to parameters35.51 Filter1 src(Filter 1 input signal source)for relevant available option.*	Zero = [0]
35.58 Filter 3 output	Monitor the output of the low pass filter 3. The value range and units and other instructions refer to the parameter *35.52Filter1 output(Filter 1 output).*	0
35.59 Filter 3 time const	Set the filter time constant of the low pass filter 3. The value range and units and other instructions refer to the parameter *35.53Filter1 timeconst(Filter 1 time constant).*	1.00 s

40 Pos control

40Pos control	Position control, positioning control	Def
40.00 Pos ctrl mode	Position control mode	Disable
POS CTRL	Positioning control, including the trajectory planning. Can support for fixed length and fixed angle control.	0
SERVO CTRL	servo control supports for conventional servo function.	1
ZERO SERVO	Zero servo control.	2
40.01 Pos ctrl enable	Position control enable signal source selection	CONST.FALSEDisable
40.02 Pos mark type	Position reference signal type.	Zmark = [0]
Zmark	Take Z pulse as reference signal	0
DI	Take the external terminal signal as reference signal the signal source is specified by the parameters of 40.03.	1
40.03 Pos mark src	Selection of external reference signal source.	CONST.FALSE
40.04 Orient dir	Direction of spindle orientation.	0
AUTO	Automatic	0
FWD	Positive	1
REV	Reverse	2
40.05 Pos spd set	Spindle positioning speed size	300rpm
[0, 30000]		
40.06 Pos refsrc	Selection of the location given signal source	PULSE = [0]
PULSE	The position given source is given by the pulse train	0
FIELDBUS	The location given source is given by the Fieldbus	1
40.07 Pos ctrl gain	Position loop gain	40Hz
[1, 100]		
40.08 Pos ffwd filter	filtering time of position feedforward	2.0ms
[0.0, 50.0]		
40.09 Pos sel in1	Signal source 1 of multi segment position selection	CONST.FALSE
40.10 Pos sel in2	Signal source 2 of multi segment position selection	CONST.FALSE

40Pos control	**Position control, positioning control**	Def
40.11 Inc pos sel in1	Signal source 1 of incremental position selection	CONST.FALSE
40.12 Inc pos sel in2	Signal source 2 of incremental position selection	CONST.FALSE
40.13 Inc pos sel in3	Signal source 3 of incremental position selection	CONST.FALSE
40.14 Feed fwd rqst	Selection of forward feed request signal source	CONST.FALSE
40.15 Feed rev rqst	Selection of reverse feed request signal source	CONST.FALSE
40.16 Pos rpt rqst	Selection of repeat location request signal source	CONST.FALSE
40.17 Pos err lim	The allowable location error of the positioning	100
[10, 1000]		
40.18 Pos preset1_rev	The number of cycles of the set value for multi segment position 1.	0
[-32768, 32767]		
40.19 Pos preset1_pul	The number of pulses of the set value for multi segment position 1.	0
[-32768, 32767]		
40.20 Pos preset2_rev	The number of cycles of the set value for multi segment position 2.	0
[-32768, 32767]		
40.21 Pos preset 2_pul	The number of pulses of the set value for multi segment position 2.	0
[-32768, 32767]		
40.22 Pos preset 3_rev	The number of cycles of the set value for multi segment position 3.	0
[-32768, 32767]		
40.23 Pos preset 3_pul	The number of pulses of the set value for multi segment position 3.	0
[-32768, 32767]		
40.24 Pos preset4_rev	The number of cycles of the set value for multi segment position 4.	0
[-32768, 32767]		
40.25 Pos preset4_pul	The number of pulses of the set value for multi segment position 4.	0
[-32768, 32767]		

40Pos control	Position control, positioning control	Def
40.26 Inc pos preset1_rev	The number of cycles of the set value for incremental position 1.	0
40.27 Inc pos preset1_pul	The number of pulses of the set value for incremental position 1.	0
40.28 Inc pos preset2_rev	The number of cycles of the set value for incremental position 2.	0
40.29 Inc pos preset2_pul	The number of pulses of the set value for incremental position 2.	0
40.30 Inc pos preset3_rev	The number of cycles of the set value for incremental position 3.	0
40.31 Inc pos preset3_pul	The number of pulses of the set value for incremental position 3.	0
40.32 Inc pos preset4_rev	The number of cycles of the set value for incremental position 4.	0
40.33 Inc pos preset4_pul	The number of pulses of the set value for incremental position 4.	0
40.34 Inc pos preset5_rev	The number of cycles of the set value for incremental position 5.	0
40.35 Inc pos preset5_pul	The number of pulses of the set value for incremental position 5.	0
40.36 Inc pos preset6_rev	The number of cycles of the set value for incremental position 6.	0
40.37 Inc pos preset6_pul	The number of pulses of the set value for incremental position 6.	0
40.38 Inc pos preset7_rev	The number of cycles of the set value for incremental position 7.	0
40.39 Inc pos preset7_pul	The number of pulses of the set value for incremental position 7.	0
40.40 Inc pos preset8_rev	The number of cycles of the set value for incremental position 8.	0
40.41 Inc pos preset8_pul	The number of pulses of the set value for incremental position 8.	0
40.42 Force home rqst	signal source of force back to zero request.	CONST.FALSE

42 Mech brake

42Mech brake	Mechanical brake control of lifting equipment	Def
42.00 Mech brake enable	The mechanical brake enable control	Disable
Disable	Not enabled. Brake output signal is always turn off.	0
Enable	Enabled. No brake response.	1

42Mech brake	**Mechanical brake control of lifting equipment**	Def
Enable with ack	Enabled, has brake response. When the response is abnormal, system will produce a protective action.	2
42.01 Mech ack src	The mechanical brake response signal source, only effective when the value of the parameters42.00 Mech brake enable is Enable with ack.	False
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter).	-
CONST.FALSE	Always be 0	0
CONST.TRUE	Always be 1	1
DI1	Digital inputDI1*(02.00 DIstate,position 0)*	2048
DI2	Digital inputDI2	2049
DI3	Digital inputDI3	2050
DI4	Digital inputDI4	2051
DI5	Digital inputDI5	2052
DI6	Digital inputDI6	2053
DI7	Digital inputDI7	2054
42.02 Brake open delay	Time required for the mechanical brake on command issued to the brake fully open. Please set according to the specifications of the brake. The unreasonable setting will cause damage to the brake due to friction.	800ms
[200ms，2000ms]		
42.03 Brake close delay	Time required for the mechanical brake off command issued to the brake completely shut down. Please set according to the specifications of the brake. The Unreasonable setting will cause hook when shutdown.	800ms
[200ms，2000ms]		
42.04 Brake open torque	At start time, mechanical brake actuator output torque setting before issuing commands.	100.0%
[50.0%, 200.0%]		0.1%
42.05 Brake check rqst src	Request signal source of the brake check. The drive checks the signal before each run. When effective，drive runs the brake check procedures. When invalid, drive runs the normal operation of the crane control program.	False
P.01.00.00	User-defined pointer (01.00.00 from left to right take two digits as a set, indicates the parameter set, index, item number in turn. The actual value is determined by the current value of the parameter).	-
CONST.FALSE	Always be 0	0

42Mech brake	Mechanical brake control of lifting equipment	Def
CONST.TRUE	Always be 1	1
DI1	Digital inputDI1*(02.00 DI state,position0)*	2048
DI2	Digital inputDI2	2049
DI3	Digital inputDI3	2050
DI4	Digital inputDI4	2051
DI5	Digital inputDI5	2052
DI6	Digital inputDI6	2053
DI7	Digital inputDI7	2054
42.06 Brake check torque	When the mechanical brake is being checked, set the drive output torque. Once after the preset check time, drive detected motor slip will emit the fault prompt.	100.0%
[50.0%, 200.0%]		0.1%
42.07 Brake check time	Mechanical brake check, the drive torque retention time.	2.0s
[0.5s，10.0s]		
42.08 Brake slip limit	Check brake. Determine whether the speed level slips or not	30rpm
[15rpm，60rpm]		
42.09 Brake open trq mem	Brake completely open. Drive motor torque, used for diagnosis, read-only.	0.1%
42.10 Brake close trq mem	The brake is closing. Drive motor torque, used for diagnosis, read-only.	0.1%

43 Winder

43 Winder	For rewinding, winding, constant tension control, etc	Def
43.00 Winder mode	Winding mode	Winder = [0]
Winder		0
Unwinder		1
43.01 Gear ratio	Mechanical transmission ratio	1.000
[0.001, 30.000]		

43 Winder	**For rewinding, winding, constant tension control, etc**	Def
43.02 Thickness	Material thickness	0.100mm
[0.001, 30.000]		
43.03 Web width	Strip material width	1000mm
[1, 30000]		
43.04 Density	Material density	1000kg/m3
[1, 30000]		
43.05 Line spd max	Maximum linear speed	300.0m/min
[0.1, 3000.0]		
43.06 Line spd src	Selection of line speed input signal source	AI1 scaled
43.07 Dia calc mode	Roller diameter calculation method	LINESPEED
LINE SPEED		0
ENCODER		1
ROLL_PULSE		2
EXT_FBK	Calculated by parameter 43.08	3
43.08 Roll dia src	Selection of signal source for external calculation of the roller diameter	AI1 scaled
43.09 Roll pulse src	Selection of drum pulse signal source	CONST.FALSE
43.10 Roll pulse scaling	Drum pulse rate, i.e. the number of pulses generated by the drum	1
43.11 Core diameter	Empty disc diameter	100mm
43.12 Full roll dia	Full size disc diameter	1
43.13 Dia reset rqst	Selection of the Diameter reset request signal source	CONST.FALSE
43.14 Dia preset rqst	Selection of volume diameter preset request signal source	CONST.FALSE
43.15 Dia preset data	Diameter preset value	100mm
43.16 Min spd dia calc	Maximum speed allowed for calculation of roll diameter	30rpm
43.17 Tense src	Selection of the tension given source	AI2 scaled

43 Winder	For rewinding, winding, constant tension control, etc	Def
43.18 Tmax	Maximum tension value setting	30.0N
43.19 Tape mode	Tension taper mode selection	0
43.20 Max tape	Maximum gain of tension taper control	0.0%
[0, 100.0]		

47 Multi step ctrl

47Multi step ctrl	Simple multi stage speed circle control to save PLC and other control equipments. Support 16 stage speed and time definitions.	Def
47.00 Speed out	Module speed output, read-only.The speed of a given pointer is controlled by pointing to the parameter P47.00.	-
47.01 Run enable src	Multi stage speed operation enables the signal source，the Bit pointer.The default is controlled by a motor operating signal.	P.06.00.04
47.02 Mode	Select the multi stage speed control mode.	0
Single	Single cycle，And keep the final value.	0
Repeat	Circulation mode.	1
Single & Stop	Single cycle,And automatically shut down。Restart need to issue a stop command.	2
47.03 Save mode	Shutdown or power down whether in memory status	0
Disable	Not enabled. Shut down with no nomemory.	0
Enable	Storage. Stop memory operation phase.	1
47.04 Stage	At the current stage of the multi segment speed loop, user can edit as the starting phase.	0
[0, 15]		
47.05 Timer	The current cycle phase corresponds to the clock，users can edit as initial time.	0
[0.0, 6553.5]		0.1min
47.06 TimeSet 0	The zeroth section corresponds to the time setting.To set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min

47Multi step ctrl	**Simple multi stage speed circle control to save PLC and other control equipments. Support 16 stage speed and time definitions.**	Def
47.07 TimeSet 1	The first section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.08 TimeSet 2	The second section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.09 TimeSet 3	The third section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.10 TimeSet 4	The fourth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.11 TimeSet5	The fifth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.12 TimeSet 6	The sixth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.13 TimeSet 7	The seventh section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.14 TimeSet 8	The eighth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.15 TimeSet 9	The nineth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.16 TimeSet 10	The tenth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.17 TimeSet 11	The eleventh section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min

47Multi step ctrl	Simple multi stage speed circle control to save PLC and other control equipments. Support 16 stage speed and time definitions.	Def
47.18 TimeSet 12	The twelfth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.19 TimeSet 13	The thirteenth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.20 TimeSet 14	The fourteenth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.21 TimeSet 15	The fifteenth section corresponds to the time setting. Set to 0 to indicate that the segment is ignored and skipped automatically.	0
[0.0, 6553.5]		0.1min
47.22 SpeedSet 0	Corresponding speed settings of the segement 0.	0
[0, 65535]		1rpm
47.23 SpeedSet 1	Corresponding speed settings of the segement 1.	0
[0, 65535]		1rpm
47.24 SpeedSet 2	Corresponding speed settings of the segement 2.	0
[0, 65535]		1rpm
47.25 SpeedSet 3	Corresponding speed settings of the segement 3.	0
[0, 65535]		1rpm
47.26 SpeedSet 4	Corresponding speed settings of the segement 4.	0
[0, 65535]		1rpm
47.27 SpeedSet 5	Corresponding speed settings of the segement 5.	0
[0, 65535]		1rpm
47.28 SpeedSet 6	Corresponding speed settings of the segement 6.	0
[0, 65535]		1rpm
47.29 SpeedSet 7	Corresponding speed settings of the segement 7.	0

47Multi step ctrl	**Simple multi stage speed circle control to save PLC and other control equipments. Support 16 stage speed and time definitions.**	Def
[0, 65535]		1rpm
47.30 SpeedSet 8	Corresponding speed settings of the segement 8.	0
[0, 65535]		1rpm
47.31 SpeedSet 9	Corresponding speed settings of the segement 9.	0
[0, 65535]		1rpm
47.32 SpeedSet 10	Corresponding speed settings of the segement 10.	0
[0, 65535]		1rpm
47.33 SpeedSet 11	Corresponding speed settings of the segement 11.	0
[0, 65535]		1rpm
47.34 SpeedSet 12	Corresponding speed settings of the segement 12.	0
[0, 65535]		1rpm
47.35 SpeedSet 13	Corresponding speed settings of the segement 13.	0
[0, 65535]		1rpm
47.36 SpeedSet 14	Corresponding speed settings of the segement 14.	0
[0, 65535]		1rpm
47.37 SpeedSet 15	Corresponding speed settings of the segement 15.	0
[0, 65535]		1rpm

48Switch Sync

48 Switch sync	**Used for synchronous or asynchronous AC motors soft start,power frequency synchronous,etc. To achieve the impact of the motor without access to the grid.**	Def
48.00 status	Status word for synchronous switching controller.	0

48 Switch sync	Used for synchronous or asynchronous AC motors soft start,power frequency synchronous,etc. To achieve the impact of the motor without access to the grid.	Def
	<table><tr><th>Position</th><th>Name</th><th>Information</th></tr><tr><td rowspan="2">0</td><td rowspan="2">Sync out</td><td>1=Switching action.</td></tr><tr><td>0=Switching no action.</td></tr><tr><td rowspan="2">1:15</td><td rowspan="2">Reserved</td><td></td></tr><tr><td></td></tr></table>	
48.01 Phase err	The phase error value of the motor and the power grid, read-only.	-
48.02 Switch enable	Enable the synchronous switching	Disable = [0]
48.03 Phase comp	The phase compensation size for synchronous switching control is used to compensate for the phase lag caused by the contactor delay and the load.	6deg
48.04 Speed comp	The phase of the motor needs to be modified to synchronize with the grid before the synchronous switching. When enable the synchronous switching, the speed compensation is automatically added to the given speed. Read-only.	0

49 Data storage

49 Data storage	16 bit data storage parameters that can be written or read using pointer settings of other parameters	Def
49.00 Data storage1	Data storage parameter 1.	0
[-32768,32767]	16 bit data.	-
49.01 Data storage2	Data storage parameter 2.	0
[-32768,32767]	16 bit data.	-
49.02 Data storage3	Data storage parameter 3.	0
[-32768,32767]	16 bit data.	-
49.03 Data storage4	Data storage parameter 4.	0
[-32768,32767]	16 bit data.	-
49.04 Data storage5	Data storage parameter 5.	0
[-32768,32767]	16 bit data.	-
49.05 Data storage6	Data storage parameter 6.	0

49 Data storage	**16 bit data storage parameters that can be written or read using pointer settings of other parameters**	Def
[-32768,32767]	16 bit data.	-
49.06 Data storage7	Data storage parameter 7.	0
[-32768,32767]	16 bit data.	-
49.07 Data storage8	Data storage parameter 8.	0
[-32768,32767]	16 bit data.	-

50 Fieldbus

50 Fieldbus	**Field bus setting**	Def
50.00 Fieldbus enable	Disable or enable the fieldbus function.	Disable = [0]
Disable	Disable	0
Enable	Enable	1
50.01 Comm loss func	Select the action to be performed when the field bus communication is lost.	No action = [0]
No action	No action	0
Fault	Report failure	1
Alarm	Report alarm	2
50.02 Comm loss time	Set the detection time of the loss of the fieldbus communication, Unit is 0.1s.	2.0 s
[0.0, 60.0]	-	-
50.03 Act1 src		
50.04 Act2 src		
50.05 Data in1	Select the data 1 transferred from the drive to the fieldbus module.	Status word = [1536]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set，In turn, said, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter).	—
Zero	Always zero	0
Status word	*Refer to parameters 06.00 Status word1 (status word 1)*	1536

50 Fieldbus	Field bus setting	Def
Act1		
Act2		
… …	…	…
50.16 Data in12	Select the data 12 transferred from the drive to the fieldbus module.	-
50.17 Data out1	Select the data 1 transferred from the field bus module to the drive.	Control word = [1541]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a a set, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter).	-
Zero	Always zero	0
Fieldbus ref1	*See parameters02.15Fieldbus ref1(Field bus given 1)*	527
Fieldbus ref2	*See parameters02.16Fieldbus ref2(Field bus given 2)*	528
Control word	*See parameters06.05 Control word(Control word)*	1541
… …	…	…
50.28 Data out12	Select the data 12 transferred from the field bus module to the drive.	Zero = [0]

51 Embedded Modbus

51 Embedded Modbus	Embedded Modbus settings	Def
51.00 Modbus enable	Disable or enable the built-in Modbus communication function.When not in use，disable it can reduce the CPU load.	Enable = [1]
Disable	Disable	0
Enable	Enable	1
51.01 Node address	Set the node address of the Modbus communication, among which 0 is the broadcast address.	1
[0, 247]		-
51.02 Baudrate	Set the serial baud rate of the Modbus communication, Unit is Bps.	9600 = [1]
4800		0
9600		1
19200		2

51 Embedded Modbus	Embedded Modbus settings	Def
38400		3
57600		4
115200		5
230400		6
460800		7
921600		8
51.03 Format	Set the serial frame format of the Modbus communication.	8, N, 1= [0]
8, N, 1	8 bit data,No verification,1stop bit	0
8, N, 2	8 bit data,No verification,2stop bits	1
8, E, 1	8 bit data,Parity check,1stop bit	2
8, O, 1	8 bit data,Odd parity check,1stop bit	3
51.04 Master mode	Set Modbus to master mode. Note: the current master mode only supports 06 function code, that is to write a single register.	Disable= [0]
Disable	Disable	0
Enable	Enable	1
51.05 Reg data	When the Modbus is working on the master station, set the data source of the target register.	Zero = [0]
P.01.00	User-defined pointer (01.00 from left to right take two digits as a set,In turn, said, indicates the parameter set, index in turn. The actual value is determined by the current value of the parameter).	—
Zero	Always zero	0
51.06 Reg addr	Modbus work as the master station, set the address of the target register.	2
[0, 65535]		
51.07 Comm cycle	Modbus work as the master station, set the communication cycle. Unit is 1ms.	100 ms
[0, 65535]	-	-
51.08 Slave addr	Modbus work as the master station, set the destination node address.	0
[0, 247]		

51 Embedded Modbus	Embedded Modbus settings	Def
51.09 Diagnostics	Diagnostic information for Modbus Communications.	0
51.10 Packet recv count	Count the message frames for this node received from the Modbus bus. Note: this counter counts only the message frames sent to this node(Broadcast frame included)	
[0, 65535]		
51.11 Packet send count	Count the message frames for this node sent to the Modbus bus.	
[0, 65535]		
51.12 Bus message count	Count all the message frames detected by this node from the Modbus bus.	
[0, 65535]		
51.13 UART error count	Count the number of serial port errors when the node receives the message frame from the Modbus	
[0, 65535]	Normally the baud rate, frame format error, will therefore increase the error.	
51.14 CRC error count	Count the number of CRC verification errors for this node to receive messages from Modbus bus.	
[0, 65535]	CRC is normally prone to errors when communication is disturbed or protocol is inconsistent. Make sure that the master-slave communication GND has been connected together.	
51.15 Frame error count	Count other errors that occur when the node receives the message frame from the Modbus bus, such as frame length error, frame timeout, etc.	
[0, 65535]	Check communication agreement.	

52 CANopen

52 CANopen	**CANopenBus communication setup**	Def
52.00 node address	CANopen slave node address.	0
[0, 127]		
52.01 Baud rate	CANopen communication baud rate	1Mbps = [8]
10k bps		0
20k bps		1
50k bps		2
125k bps		3
250k bps		4
500k bps		5
625k bps		6
800k bps		7
1M bps		8
52.02 PDO4 cfg	PDO4 local configuration options	Disable
Disable		0
Enable		1
52.03 RPDO4 enable	RPDO4 enable	Disable
Disable		0
Enable		1
52.04 RPDO4 type	RPDO4 transmission type	255
[0, 255]		
52.05 RPDO4 obj1 index	RPDO4 Data 1 Index	0
52.06 RPDO4 obj1 subid	RPDO4 Data 1 sub index	0
52.07 RPDO4 obj2 index	RPDO4 Data 2 Index	0
52.08 RPDO4 obj2 subid	RPDO4 Data 2 sub index	0

52 CANopen	CANopenBus communication setup	Def
52.09 RPDO4 obj3 index	RPDO4 Data 3 Index	0
52.10 RPDO4 obj3 subid	RPDO4 Data 3 sub index	0
52.11 RPDO4 obj4 index	RPDO4 Data 4 Index	0
52.12 RPDO4 obj4 subid	RPDO4 Data 4 sub index	0
52.13 TPDO4 enable	TPDO4 enable	Disable
Disable		0
Enable		1
52.14 TPDO4 type	TPDO4 transmission type	255
52.15 TPDO4 event time	TPDO4 event timing	100
52.16 TPDO4 obj1 index	TPDO4 Data 1 Index	0
52.17 TPDO4 obj1 subid	TPDO4 Data 1 sub index	0
52.18 TPDO4 obj2 index	TPDO4 Data 2 Index	0
52.19 TPDO4 obj2 subid	TPDO4 Data 2 sub index	0
52.20 TPDO4 obj3 index	TPDO4 Data 3 Index	0
52.21 TPDO4 obj3 subid	TPDO4 Data 3 sub index	0
52.22 TPDO4 obj4 index	TPDO4 Data 4 Index	0
52.23 TPDO4 obj4 subid	TPDO4 Data 4 sub index	0
52.24 NMTstage	NMT status	0
Init		0
Disable		4
Enable		5
Stand by		127
52.25 CAN error	read-only.	0
52.26 CAN err counter	read-only.	0

52 CANopen	**CANopenBus communication setup**	Def
52.27 CAN RX msg cnt	Count the number of the data packets received by CAN.	0
52.28 CAN TX msg cnt	Count the number of the data packets sent by CAN.	0
52.29 DSP402 state machine	DSP402 state machine.	0
Not rdy swich on		0
Switch on disable		1
Ready switch on		2
Switch on		3
Operation enable		4
Device fault		5
52.30 Control word	Control word.	0
52.31 Status word	Status word.	0

60 Motor control

60 Motor control	Motor control set	Def
60.00 Carrier freq set	Carrier frequency setting of the drive. Affected by the temperature of the drive and the frequency of the motor, The actual carrier frequency may be different, refer to parameter P09.04.	Type decision
[2kHz, 812kHz]	Enhance the carrier can reduce motor noise. For long-distance transmission, if no reactor at the output side, it is necessary to reduce the carrier to reduce the reflected voltage of motor, to avoid motor insulation failure and burned.	
60.01 Slip gain	Slip compensation gain of the asynchronous motor.	1.00
[0.00, 1.00]	In open loop control, it is used to modify the speed estimation value. Closed-loop control with encoder, it is used to correct the error of the rotor time constant, so that the motor is in the best state.	
60.02 Torque boost	Manual boost capacity of the motor torque. Normally no need to set.	0.00
[0.00, 1.00]	Manual torque boost ratio, relative to the rated torque of the motor.	
60.03 SC brake time	Synchronous motor to start short circuit braking time.	0.0s
[0.0s, 100.0s]	Start short circuit braking time.	-
60.04 Res damp gain	Oscillation suppression gain.	0.50
[0.00, 3.00]	The open loop V/F control applicable for synchronous and asynchronous motors.	
60.05 Excitation time	The pre excitation time of vector control of the asynchronous motor.	0.0s
[0.0s, 5.0s]	Increasing the pre excitation time can improve the starting torque.	
60.06 Fly restart	Speed tracking enable control can only be used in open loop V/F control mode of the asynchronous motor.	Disable = [0]
Disable	Speed tracking function disabled.	0
Enable	Speed tracking function enabled.	1
60.07 Vdc max control	Activate or disable the overvoltage stall function by this parameter.	Enable = [1]
Disable	Disable over voltage stall function.	0
Enable	Enable over voltage stall function.	1
Enable at equeal	Activation of the overvoltage stall, but is invalid in the deceleration. Used for periodic load equipment.	2
60.08 Vdc min control	Activate or disable the under-voltage stall function by this parameter.	Disable = [0]
Disable	Disable under voltage stall function.	0

60 Motor control	**Motor control set**	Def
Enable	Enable under voltage stall function.	1
60.09 Auto phase mode	Search mode for initial phase of the synchronous motor.	Auto = [0]
Auto	Enable automatically. Normally performs after power up and coast stop.	0
Always	Always enable the phase search function.	1
Disable	Always disable the phase search function.	2
60.10 PM type	The rotor type of the synchronous motor. The change of the search mode caused by the structure of the rotor.	[1]
Type 1 non standard	Special phase search mode, suitable for partially embedded motor, such as squirrel cage motor.	0
Type 2 standard type	Standard phase search method， Suitable for surface mount motors and most embedded motors	1
60.11 Cur inject	Synchronous motor phase to find the size of the injected current. For the case of a synchronous motor with squirrel cage, as well as big rating drive control small rating motor, needs to be slightly increased.	30%
[0, 100]		
60.12 Phase comp	The phase compensation value of the synchronous motor. For quick start application 90° is the best, while ordinary start 30° is the best。Normally set in the range of 0 to 90°.	30deg
[-180, 180]		
60.13 Over modu gain	Over modulation output intensity。	15%
[0, 15]		
60.14 PWM mode	PWM modulation mode.	THD = [0]
AUTO THD	The PWM mode is automatically adjusted to minimize the output voltage harmonics.	0
AUTO SL	The PWM mode is automatically adjusted to minimize the IGBT switching loss.	1
SVPWM	SVPWM represents a continuous PWM mode, DPWM means intermittent PWM mode.	2
DPWM MIN	DPWM MIN mode, micro drive series driver does not support DPWM mode.	3
DPWM MAX	DPWM MAX mode	4
DPWM3	DPWM3 mode	5
DPWM2	DPWM2 mode	6

60 Motor control	Motor control set	Def
DPWM1	DPWM1 mode	7
DPWM0	DPWM0 mode	8
60.15 Flux brake gain	Magnetic flux braking gain	0%
[0, 100]		
60.16 Energy opt gain	Energy-saving control gain of the asynchronous motor.	0%
[0, 50]		
60.17 FOC spd max	Maximum allowable speed for closed loop control. If exceeds the maximum will switch to the open loop control.	30000rpm
[0, 32767]		

61 Encoder config

61Encoder config	Encoder config	Def
61.00 Pulse per rev	Define the resolution of the encoder, i.e. the number of pulses per revolution.	2048
[100, 65535]	Encoder resolution. Without octaves.	-
61.01 Electric offset	Define the offset angle of the encoder Z pulse relative to the dq coordinate system.	0
[0°, 360°]	Only applicable to synchronous motor.	1°
61.02 Encoder phase	Define the phase of the encoder signal.	Normal = [0]
Normal	Normal phase, i.e. A is ahead of B the speed is positive.	0
Invert	Inverse phase, i.e. A is ahead of B the peed is negative.	1
61.03 Enc counter mode	Define the encoder count mode.	Quadrate= [0]
Quadrate	Count the way of quadrature counting, automaticlly 4 ovtave.	0
Direction	Pulse plus direction count, automatically 2 octave.	1
61.04 Pulse cnt mode	Define the count mode of the pulse inputs used for the location given. *Refer to parameters 61.03 Enc counter mode(Encoder count mode)for relevant available options.*	Quadrate= [0]
61.05 Gear den	The electronic gear denominator of the position pulse input.	1000
[1, 65535]	Pulse input used for the given position.	-

61Encoder config	Encoder config	Def
61.06 Gear num	The electronic gear molecule of the position pulse input.	1000
[1, 65535]	Pulse input used for the given position.	-
61.07 Encoder enable	The enable encoder module, can only be used for small micro series driver.	Disable = [0]
Disable	Disable encoder function.	0
Enable	Enable encoder function.	1

62 Motor parameter

62 Motor parameter	Motor parameter setting	Def
62.00 Pole pairs	The pole number of the motor. Calculate automatically before drive running. The correct setting of the rated speed and rated frequency is the premise of correct calculation.	Model correlation
[1, 30]	The pole number of the motor. Applicable to all types of AC motors.	-
62.01 No-load current	No-load current of the asynchronous motor. When using the synchronous motor, this parameter is retained.	Model correlation
[0A, 400.0A]	This parameter is usually obtained by auto tuning. You can also manually set.	
62.02 Stator resist	Stator phase resistance of motor. Applicable to all types of AC motors.	Model correlation
[0Ω, 65.535Ω]	This parameter is usually obtained by auto tuning, You can also manually set.	
62.03 Rotor resist	Rotor phase resistance of motor. Only for induction motors.	Model correlation
[0Ω, 65.535Ω]	This parameter is usually obtained by auto tuning, You can also manually set.	
62.04 Stator induct	Stator phase inductance of electric machine.	Model correlation
[0mH, 3000.0mH]	This parameter is usually obtained by auto tuning, You can also manually set.	
62.05 Leak induct coef	Leakage inductance coefficient of electric machine。Only for induction motors.	Model correlation
[0%, 20.0%]	This parameter is usually obtained by auto tuning. You can also manually set.	
62.06 d-axis induct	D axis inductance. Only applicable to synchronous motor.	Model correlation
[0.00mH, 300.00mH]	This parameter is usually obtained by auto tuning. You can also manually set.	
62.07 q-axis induct	q axis inductance。Only applicable to synchronous motor。	Model correlation
[0.00mH, 300.00mH]	This parameter is usually obtained by auto tuning. You can also manually set.	

62 Motor parameter	Motor parameter setting	Def
62.08 Back EMF coef	Back EMF coefficient of synchronous motor, only applicable to synchronous motor. Automatic correction during drive operation.	Model correlation
[0.0mV, 3000.0mV]	This parameter is usually obtained by auto tuning. You can also manually set.	0.1mV/rpm
62.09 Core sat coef	Iron core saturation coefficient of electric machine.	80%
[50, 100]	This parameter is usually obtained by auto tuning. You can also manually set.	
62.10 PM with squirrel	Synchronous motor with a squirrel cage for 1, auto tuning can be obtained.	0
[50, 100]	This parameter is usually obtained by auto tuning. You can also manually set.	

63 Startup parameter

63 Startup parameter	Start Related Parameter Settings	Def
63.00 Motor nom power	Define motor rated power.This setting must be consistent with the motor nameplate value.If one drive control the multi motors, input motor total power. Be careful：When the drive is running, this parameter cannot be changed.	Default values depend on Models
[0.00kW, 630.00 kW]		-
63.01 Motor nom volt	The rated motor voltage is defined as the root mean square voltage between the basic lines supplied to the motor at the rated operating point.This setting must be consistent with the motor nameplate value. Be careful： • For permanent magnet motors, means the rated speed of the back EMF. Do not need very accurate, because the drive automatic recognition of back EMF in operation. • When the drive is running, the parameter cannot be changed.	Default values dependon Models
[0 V, 1000 V]		
63.02 Motor nom current	Define motor rated current.The value must be equal to the motor nameplate.If the drive control multi motors, input motor total current. Be careful： • The correct operation of the motor requires no more than ninety percent of the rated current of the drive. • When the drive is running,This parameter cannot be changed.	Default values depend on Models
[0.0 A, 1200.0 A]		
63.03 Motor nom speed	Define motor rated speed.This setting must be consistent with the motor nameplate value. Be careful： When the drive is running, this parameter cannot be changed.	Default values depend on Models

63 Startup parameter	**Start Related Parameter Settings**	Def
[0 RPM, 30000 RPM]		
63.04 Motor nom freq	Define motor rated frequency. Be careful： When the drive is running, the parameter cannot be changed.	50Hz
[0 Hz, 1000 Hz]		
63.05 Motor type	Select motor type. Be careful：When the drive is running, the parameter cannot be changed.	ACIM = [0]
ACIM	Asynchronous motor, three phase AC induction motor, Squirrel cage rotor.	0
PMSM	Permanent magnet motor.Three phase AC synchronous motor, Permanent magnet rotor and sinusoidal back EMF voltage.	1
SynRM	Synchronous reluctance motor.Three phase AC synchronous motor with non permanent salient pole rotor.	2
63.06 ID run request	Select the drive at the next startup motor to identify the type of operation. After completion of the auto tuning of motor, drive will stop. Notice：When the drive is running, this parameter cannot be changed. Once activated the auto tuning, you must stop the drive first, and then stop auto tuning. Notice： • The auto tuning can only be performed in local control mode (The drive is controlled by a PC tool or control panel) • Must be identified in the auto tuning process，Safety torque interrupt and emergency stop circuit must be closed.	No request = [0]
No request	No motor auto tuning operation required。	0
Normal	Normal operation of auto tuning. Ensure that in all cases have good control accuracy. Auto tuning run for continued 90 seconds. Under normal circumstances, this mode should be selected. Notice： • In the following two cases to perform routine auto tuning. Must disconnect the mechanical connection between motor and driven equipment：If the load torque is higher than 20%；If the mechanical device driven by the motor is not able to withstand the rated speed transients during the normal auto tuning operation. • Before starting auto tuning，please check the motor turn. During auto tuning, motor will be forward。 Warning！Motor in the running speed can reach about 50... 100% of rated speed. Before the start auto tuning operation, please confirm whether can ensure safety.	1
Standstill	Static auto tuning operation. Motor power into the dc or ac current. For asynchronous motors, the motor will not turn(For permanent magnet motor and synchronous reluctance motor，motor rotation travel less than half turn) . Notice： Only by the influence of the connected mechanical parts，can not conduct *Normal* auto tuning run time, select the mode(For example, the rising edge of activation or lift applications) .	2

63 Startup parameter	Start Related Parameter Settings	Def
Auto-phasing	Only applicable to synchronous motor，Used to identify initial Angle encoder under stationary state.	3
63.07 Drive mode	Select motor control mode.	Enhanced V/F= [0]
Openloop vector	Open loop vector control model is suitable for most applications.	0
Close loopVectorvector	Closed loop vector control.This model is used for occasions with strict requirements for speed and torque accuracy and response speed. You must install the PG card plus encoder to obtain the speed feedback to a closed-loop control. It can reduce the dependence on motor parameters degree.	1
63.08 Phase inversion	Change the motor's turn.If the motor rotates in the wrong direction(For example, the power line of the motor is connected wrong)，And unable to re wiring，You can use this parameter. Notice：After changing this parameter，Encoder feedback signal must be checked(If there). Refer to parameter *01.14Motorspeedest*(Motor speed estimation)Signal and *01.08Encoder1speed* (Encoder 1 speed)(or 01.10 Encoder 2 speed) Signal compared to conduct Check.If these signals are in conflict, the wiring of the encoder must be corrected or auto tuning.	Normal, UVW = [0]
Normal, UVW	Motor phase sequence is normal.	0
Invert, UWV	Motor phase inverting,V and W exchange.	1
63.09 Macro sel	Select the drive application macro.	Factory = [0]
Factory	Default factory application macros.	0
Retain		1

■ 6. Field Bus

data set

Address	Name
0001	Fieldbus control word (corresponding to monitoring parameter address 6.05)
0002	Field bus given 1(corresponding to monitoring parameter address02.15)
0003	Field bus given 2(corresponding to monitoring parameter address02.16)
0004	Field bus status word
0005	Field bus actual value1
0006	Field bus actual value2
0007-0018	Field bus module input1-12(parameter50.05-50.16)
0019-0030	Field bus module output1-12(parameter50.17-50.28)

Fieldbus control word can be viewed by parameter 6.05， Please refer to this manual before.

【Field bus status word format】

No.	Name	Meaning
0	Ready	1：Operationalreadiness
1	Enabled	1：Run enable
2	Modulating	1：PWM signal output
3	Following ref	1：
4	Em OFF2	1：Free parking mode
5	Em OFF3	1：Emergency stop mode
6	Start inhibit	1：Start inhibit
7	Alarm	1：Alarm
8	At setpoint	1：The output is consistent with the set (speed arrival or torque arrival)
9	Torque limited	1：Torque limited
10	Speed limited	1：Speed limited
11	EXT2 active	1：Control ground 2 effective
12	Local ctrl	1：Local ctrl
13	Zero speed	1：Zero speed
14	Direction reverse	1：Direction reverse
15	Fault	1：Fault

【Related parameters】

parameter address	parameter name	parameter values
51.00	Modbus enable	Enable = [1]
51.01	Node address	-
51.02	Baudrate	-
51.03	Format	-

【Sample】

The following is an example of node address equal to 1,The last CRC check code is only applicable to this case,To change any data should be recalculated after CRC check code,Can use the software automatically generated.

1、 Read drive status

Request frame：01 03 06 00 00 01 84 82

Response frame：01 03 02 B4 81 0F 24

2、 Modify drive given speed(First, the signal source for the given speed is field bus
3、 given 1）
Request frame：01 06 00 02 03 E8 28 B4
Response frame
4、 boot drive(Modify the external control to start first、Stop command signal source for fieldbus communication)
Request frame：01 06 00 01 08 82 5F AB

(Where 0x0882 for startup command,Note that bit 7 and bit 11 must always be maintained at a level of 1)

Response frame slightly
5、 Stop driver
Request frame：01 06 00 01 08 81 1F AA
(Where 0x0881 is a shutdown command,Note that bit 7 and bit 11 must always be maintained at a level of 1)
Response frame slightly
6、 Read *parameter 22.00Acc time1(Acceleration time 1)*Attribute
Request frame：01 42 0000 1600 77 A5
Response frame：01 42 00 0008 AC 7E 78
7、 Read *parameter22.00Acc time1(Acceleration time 1)*Default value
Request frame：01 42 0001 1600 26 65
Response frame：01 42 000101 F4 28 12
8、 Read *parameter 22.01 Dec time1(Deceleration time 1)*Minimum value
Request frame：01 42 00 02 16 01 17 A5
Response frame：01 42 00 02 00 01 19 C5
9、 Read *parameter 22.01 Dec time1(Deceleration time 1)*Maximum value of
Request frame：01 42 00 03 16 01 46 65
Response frame：01 42 00 03 EA 60 C6 8D
10、 Read *parameter 01 Actual values(actual value)*Containednumber of parameters
Request frame：01 42 00 04 16 01 F7 A4
Response frame：01 42 00 04 00 0D F9 C1

Address	Name
0001	Field bus control word(Corresponding monitoring parameter address06.05)
0002	Field bus given1(Corresponding monitoring parameter address02.15)
0003	Field bus given2(Corresponding monitoring parameter address02.16)
0004	Field bus status word
0005	Field bus actual value1
0006	Field bus actual value2

Field bus control word

No.	Name	Meaning
0	Stop	1：Stop
1	Start	0->1：start-up
2	Em OFF2	1：Select the free parking mode(The bit 0 must be set to 1)
3	Em OFF3	1：Select emergency stop mode(The bit 0 must be set to 1)
4	Loc ctrl req	1：Local control request
5	Ramp stop	1：Select deceleration stop mode(The bit 0 must be set to 1)
6	Coast stop	1：Free parking mode(The bit 0 must be set to 1)
7	Run enable	1：Run enable

8	Reset	0->1：Reset fault
9	JOG1	0->1：Move 1
10	JOG2	0->1：Move 2
11	Remote	1：Remote control
12		
13		
14		
15	EXT2 sel	1：Selective control 2

Field bus status word

No.	Name	Meaning
0	Ready	1：Operational readiness
1	Enabled	1：Run enable
2	Modulating	1：PWM signal output
3	Following ref	1：
4	Em OFF2	1：Free parking mode
5	Em OFF3	1：Emergency stop mode
6	Start inhibit	1：Start inhibit
7	Alarm	1：Alarm
8	At setpoint	1：The output is consistent with the set (speed arrival or torque arrival)
9	Torque limited	1：Torque limiter
10	Speed limited	1：Speed limiting
11	EXT2 active	1：Control ground 2 effective
12	Local ctrl	1：Local control
13	Zero speed	1：Zero speed
14	Direction reverse	1：Reversal
15	Fault	1：Fault

Modbus

For more instructions please refer to*Modbus_Application_Protocol_V1_1b3.pdf，User can be from www.**modbus**.org Download this document.*

MODBUS communication protocol based on master-slave mode，Communication is initiated by the master station,Receive requests from the machine and respond to,*Address of master station and slave station should be consistent*,Broadcast support，At this time the main station address is 0。MODBUS build upon the universal asynchronous transceiver (UART),*The master and the baud rate and frame format of station also need consistent.*

MODBUS basic unit is a byte,The format of the RTU mode frame is as follows (the middle omitted part is determined by the function code)：

Node address	Function code	…	CRC check code	
1 byte	1 byte	…	Low 8 bit	High 8 bit

Be careful：For the 16 bit register address、Number and data, etc.,The big endian format storage,High byte in front,Low byte after.but,CRC check code(Polynomial 0xA001)Using small end storage,Low byte in front,High byte after.

Function Code And Frame Format

at present,Only the following functions are supported(Suffix H said sixteen decimal,Suffix D said ten decimal)

03H	Reading a keep register	Reads the current value of the N parameter
06H	Write a single register	Rewrite the current value of a single parameter
08H	Diagnosis	For testing, checking communication link status, supporting the following sub function code： 0x00 returns query data 0x01 reset communication Initialize and restart the serial port of the slave device,Clear all communication event counters. 0x04 forced to listen only mode Forcing the specified slave to listen only mode, the slave will not respond to this message.
10H or 16D	Write multiple registers	Rewriting continuity the current value of the N parameter
42H or 66D	Read parameter related information	Used to read the drive parameters related information to support the following sub function code： 0x00 Read the attributes of the specified parameters 0x01 Read the default values for the specified parameters 0x02 Read the minimum value of the specified parameter 0x03 Read the maximum value of the specified parameter 0x04 Read the number of parameters for the specified parameter group 0x05 Read the visibility of the specified parameter group
55H or 85D	Read data log	

03H Request frame →3H Response frame（The number of bytes is equal to 2 times the number of registers）

Node address	03	Register start address		Number of registers	
		High 8 bit	Low 8bit	High 8 bit	Low 8bit

Node address	03	Number of bytes	Register data 1		…
			High 8 bit	Low 8bit	…

06H Request frame →06H Response frame（The same with the left side request）

Node address	06	Register address		Register data	
		High 8 bit	Low 8bit	High 8bit	Low 8bit

08H Request frame

Node address	08	Sub function code		Data	
		High 8 bit	Low 8 bit	High 8 bit	Low 8 bit

10H Request frame（The number of bytes is equal to 2 times the number of registers）

Node address	10	Register start address		Number of registers		Number of bytes	Register data 1		…
		High 8 bit	Low 8 bit	High 8 bit	Low 8 bit		High 8 bit	Low 8 bit	…

10H Response frame（Returns the first 6 bytes of the request frame）

42H Request frame

Node address	42	Sub function code		Parameter address	
		High 8 bit	Low 8 bit	High 8 bit	Low 8 bit

42H Response frame

Node address	42	Sub function code		Parameter information	
		High 8 bit	Low 8 bit	High 8 bit	Low 8 bit

Parameter address

Parameter address is 16 bits， High 8 bit parameter group number， Low 8 bit is within the group index。

GROUP	**INDEX**	Address	
		Hexadecimal	Decimal system
00 Communication data	01-30 Data set	0001-001E	0001-0030
01 Parameter group 01	00- 255 Parameter 01.00-01.255	0100-01FF	256-511
02 Parameter group 02	00- 255 Parameter 02.00-02.255	0200-02FF	512-767
…	…	…	…
63 Parameter group 63	00- 255 Parameter 63.00-63.255	3F00-3FFF	16128-16383

Notice：

1、For each actual parameter, please refer to this manual.

2、The use of PLC as the main station parameter address need to add 40000,If the communication address of parameter 01.00 is 40256.

Notice： For more instructions please refer to*Modbus_Application_Protocol_V1_1b3.pdf,User can be from www.**modbus**.org Download this document.*

Function code list

Function code	**Name**	**Describe**
0x03	Read hold register	Read one or more parameters
0x06	Write a single register	Write a single parameter
0x08	Diagnosis	For testing, check the communication between the master station and the slave station, only support the following sub function code： 0x01 reset communication Initialize and restart the serial port of the slave device, clear all communication event counters. 0x04 Force to listen only mode. Forcing the specified slave to listen only mode, the slave will not respond to this message.
0x10	Write multiple registers	Write continuous multiple parameters
0x42	Read parameter related information	The information used to read the drive parameters is currently only supported by the following sub function code： 0x01 Read the attributes of the specified parameters 0x02 Read the default values for the specified parameters 0x03 Read the minimum value of the specified parameter 0x04 Read the maximum value of the specified parameter 0x05 Read the number of parameters for the specified parameter group 0x06 Read the visibility of the specified parameter group

Related parameters

Parameter address	Parameter name	parameter values
51.00	Modbus enable	Enable = [1]
51.01	Node address	-
51.02	Baudrate	-
51.03	Format	-

Sample description (sixteen decimal)

11、Read drive status

Request frame format：01 03 06 00 00 01 84 82

(Among 0x0600 Namely representation *parameter 06.00 Status word1(Status word 1)*)

Response frame format：01 03 02 B4 81 0F 24

(Among 0xB481 Current status for the drive)

Modify the given speed of the drive (first modify the speed of the given signal source for the fieldbus given 1)

Request frame format：01 06 00 0203E8 28 B4

(Among 0x0002 It indicates that the fieldbus given 1,0x03E8 Express 1000RPM)

Response frame slightly

12、Boot drive(Start by modifying the external control、Stop command signal source for fieldbus communication)

Request frame format：01 06 00 01 08 82 5F AB

(Among 0x0001 Namely representation fieldbus control word，0x0882 Start command,Note that bit 7 and bit 11 must always be maintained at a level of 1)

Response frame slightly

13、Stop driver

Request frame format：01 06 00 01 08 81 1F AA

(Among 0x0001 Namely representation fieldbus control word,0x0881 Stop command,Note that bit 7 and bit 11 must always be maintained at a level of 1)

Response frame slightly

14、Read *parameter 22.01 Dec time1(Deceleration time 1)*Maximum value of

Request frame format：01 42 00 04 16 01 F7 A4

(Among 0x0004 Represents the maximum value of the specified parameter,0x1601 Specified *parameter 22.01 Dec time1(Deceleration time 1)*)

Response frame format：01 42 00 04 FF FF39B4

(Among 0xFFFFThe maximum value of the deceleration time 1,Here for 655.35s)

15、Read *parameter set 01 Actual values(actual value)*Number of parameters

Request frame format：01 42 00 05 01 00 68 54(The underlined 00 representation can be any value)

(Among 0x0005 The number of parameters to read the specified parameter group,0x01 Specified *parameter group 01 Actual values(actual value)*)

Response frame format：01 42 00 05001F28 0C

(Among 0x001F Parametric array 01 Actual valuesContain number of parameters，Here for 31)

CANopen

CANopen Protocol introduction

CANopen Protocol based on CAN protocol，The CAN protocol defines the first layer of the OSI reference model in the seven layer(physical layer)And the second layer(data link layer)Norm，CANopenDefines the seventh layer (application layer) specification.CANopenProtocols can be applied to multiple industries,This manual only describes the CANopen protocol used in the drive control industry information.
A detailed description of the CAN,Please refer to the documentBOSCH Controller Area Network(CAN) Specification V2.0.
A detailed description of the CANopen,Please refer to the following documents：
1、DS 301 Application Layer and Communication Profile(The application layer and the communication rules)
2、DSP 402 Device Profile for Drives and Motion Control(Drive and motion control equipment industry)
3、DS 306 Electronic Data Sheet Specification for CANopen(EDS file specification)

Communication object

【Communication identifier】

When using the CAN2.0A protocol,Communication identifier COB-ID is 11 bits,The CAN device filters the message through this identifier.The encoding format is as follows (Notes：Node address valid Value range 1~127)：

b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Function code				Node address						

Communication object	Function code(Binary)	COB-ID(Hexadecimal)
NMT	0000	000
SYNC	0001	080
EMERGENCY	0001	081~0FF
TIME STAMP	0010	100
TPDO1	0011	181~1FF
RPDO1	0100	201~27F
TPDO2	0101	280~2FF
RPDO2	0110	301~37F
TPDO3	0111	381~3FF
RPDO3	1000	401~47F
TPDO4	1001	481~4FF
RPDO4	1010	501~57F
Download SDO	1011	581~5FF
Upload SDO	1100	601~67F
NMTE	1110	701~77F

【frame format】

CAN2.0 standard up to 8 bytes of data transmission,First bytes before the most,Eighth bytes at last.Therefore,CANopen Message frame format is as follows：

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte

Notes：CAN device uses a high priority way to transmit a single byte,First transmission bit 7,Last transmission bit 0.

【Frame head】

CANopenMessage frame header contains communication identifier、Remote request bit and data length,The encoding format is as follows：

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Communication identifier											RTR	Data length			

Notes： RTRRemote request bit,0 Express data frame,1 Express remote frame.

【SDO Service data object】

SDO service data objects based on object index and the index,Found in the object dictionary object and execute the command,Read or overwrite objects.Because the object type is diverse,Unequal in size(See object dictionary section),So SDO supports faster transmission and ordinary
general transmission.The first byte of the SDO message frame contains the transport type e、Command selector CS and other fields,Determines the mode of transmission.
Only when the node is enabled or standby mode,Ability to access SDO.
SDO server and client based model,Drive as a server,Other CANopen devices as clients.Communication initiated by client request,The server receives the request and responds.The client and server command definitions are not the same,The code is as follows：

Command selector	The server	Client
0	Segmented upload	Segmented Download
1	Segmented Download	Start download
2	Start uploading	Start uploading
3	Start download	Segmented upload
4	Give up transmission	Give up transmission

Download SDO

The client can rewrite the object in the server (or drive) object dictionary through the SDO download service.

Speed up transmission

When the number of bytes of the object is less than or equal to 4,Used to speed up transmission.here,Data field stores object data.

client request

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
B028	Command	Object index		Sub index	Data domain			

Command code is as follows：

Position	Name	Explain	Value
0	s	Size indicator,1 indicates that the N field indicates the size of the data field,0 indicates that the n field is reserved	0 or1
1	e	Transport type,1 to speed up the transfer,0 indicates normal transmission	1
2-3	n	s=1 time,This field is only valid.	0-3
4	x	Retain	0
5-7	ccs	Client command selector	1

Server response

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
C024	Command	Object index		Sub index	Retain			

Command code is as follows：

Position	Name	Explain	Value
0-4	x	Retain	0
5-7	scs	Server command selector	3

Ordinary transmission

【Start download】

When the number of bytes exceeds 4 bytes，The client uses the common transmission，Notification will be downloaded to the server(Namely drive)Number of bytes of the object。here，The number of bytes stored in the data field.

Client request

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
B028	Command	Object index		Sub index	Data domain			

Command code is as follows：

Position	Name	Explain	Value
0	s	Size indicator,1 indicates that the N field indicates the size of the data field,0 indicates that the n field is reserved	0 Or1
1	e	Transport type,1 to speed up the transfer,0 indicates normal transmission	0
2-3	n	s=1 time,This field is only valid.	0-3
4	x	Retain.	0
5-7	ccs	Client command selector.	1

The server response and speed up the transfer the same.

【Subsection Download】

After the server (Namely drive) correctly receives the number of bytes in the object,The client is in a byte order from low to high,Using segmented transmission in turn up to 7 bytes of data segment.

client request

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
B028	Command	Segment data						

Command code is as follows：

Position	Name	Explain	Value
0	c	End indicator,1 said the end of the segmented Download.	0 Or 1
1-3	n	The nonzero n value indicates that the last n bytes of the message frame do not contain data.	0-7
4	t	Turning and turning,The first segment message frame will clear this bit 0,After each segmented message frame will this turn.	
5-7	ccs	Client command selector	0

Server response

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
C021	Command	Retain						

Command code is as follows：

Position	Name	Explain	Value
0-3	x	Retain	0
4	t	Turning and turning	
5-7	scs	Server command selector	1

Upload SDO

The client can read the server through the SDO upload service (Namely drive) Object in the object dictionary.

【Speed up transmission】

When the number of bytes of the object is less than or equal to 4,Used to speed up transmission.here,Data field stores object data.

client request

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
C024	Command	Indexes		Sub Indexes	Retain			

Command code is as follows：

Position	Name	Explain	Value
0-4	x	Retain	0
5-7	ccs	Client command selector	2

Server response

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
B028	Command	Indexes		Sub Indexes	Data domain			

Command code is as follows:

Position	Name	Explain	Value
0	s	Size indicator,1 indicates that the N field indicates the size of the data field,0 indicates that the n field is reserved	0 or 1
1	e	Transport type,1 to speed up the transfer,0 indicates normal transmission	1
2-3	n	s=1 time,This field is only valid.	0-3
4	x	Retain	0
5-7	scs	Server command selector	2

【Ordinary transmission】

【Start uploading】

When the number of bytes exceeds 4 bytes,The client uses the common transmission,Gets the number of bytes to be uploaded from the server (Namely drive).here,The data field stores the number of bytes in the object.

Client requests are the same as speeding up the transfer。

Server response

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
C028	Command	Object index		Sub Indexes	Data domain			

Command code is as follows：

Position	Name	Explain	Value
0	s	Size indicator,1 indicates that the N field indicates the size of the data field,0 indicates that the n field is reserved	0 or 1
1	e	Transport type,1 to speed up the transfer,0 indicates normal	0

Position	Name	Explain	Value
		transmission	
2-3	n	s=1 time,This field is only valid。	0-3
4	x	Retain	0
5-7	scs	Server command selector	2

【Segmented upload】

After the client correctly receives the number of bytes， The server (Namely drive) follows the byte order from low to high， Using segmented transmission in turn up to 7 bytes of data segment。

client request

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
C021	Command	Retain						

Command code is as follows：

Position	Name	Explain	Value
0-3	x	Retain	0
4	t	Turning and turning	
5-7	ccs	Client command selector	3

Server response

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
B028	Command	Segment data						

Command code is as follows：

Position	Name	Explain	Value
0	c	End indicator,1 said the end of the segmented Download。	0 or 1
1-3	n	The nonzero n value indicates that the last n bytes of the message frame do not contain data.	0-7
4	t	Turning and turning， The first segment message frame will clear this bit 0,After each segmented message frame will this turn.	
5-7	scs	Server command selector.	1

SDO Abort transmission

By SDO rewrite or while reading object,If there is an error,The server (Namely drive) terminates the current transfer(cs = 4),And return to the end of the code,The format is as follows：

Frame head	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	80	Object index		Sub Indexes	Stop code			

Stop code

Stop code (sixteen decimal)		Describe
High 16 bit	**Low 16 bit**	
0503	0000	The two consecutive transmission does not reverse the flip bit
0504	0000	A timeout occurs when an ordinary transmission segment uploads or downloads
	0001	Invalid or illegal command selector
	0005	Out of storage space
0601	0000	Unsupported object access
	0001	Attempt to read only write objects
	0002	Attempt to rewrite read-only objects

Stop code (sixteen decimal)		Describe
High 16 bit	Low 16 bit	
0602	0000	This object does not exist in the object dictionary
0604	0041	PDO cannot map this object
	0042	The total length of the object of the PDO map exceeds the length limit
	0043	parameters not compatible
	0047	Incompatible
0606	0000	Hardware error causes access failure
0607	0010	Data type mismatch, service parameter length mismatch
	0012	Data type mismatch, service parameter length is too long
	0013	The data type does not match, the service parameter length is too short
0609	0011	Sub index does not exist
	0030	Parameter value scope of cross-border (only for write operations)
	0031	Write the parameter value is too large
	0032	Write parameter values are too small
	0036	The maximum value is smaller than the minimum
0800	0000	Common error
	0020	Data cannot be transferred to the application
	0021	Data cannot be transferred to the application because the device is in local control mode
	0022	Due to the current state of the device (Such as running),Data cannot be transferred to the application
	0023	The object dictionary has failed to generate a dynamic or no dictionary

Emergency message

Object dictionary

Object code	object type	Object description
2	Block	Variable data，Executable program
5	type definition	Define a type of object
6	Structure definition	Defining a struct object
7	Variable	Objects with basic data types
8	Array	An object that consists of several variables with the same data type
9	Structural morphology	By a number of variables of the object, the data types of variables can be different

Data type	Type description
BOOL	Boolean type integer, value 0,1
S8	8 bit signed integer,Range of values -128~127
S16	16 bit signed integer,Range of values -32768~32767
S32	32 bit signed integer,Range of values -2147483648~2147483647
U8	8 bit unsigned integer,Range of values 0~255
U16	16 bit unsigned integer,Range of values 0~65535
U32	32 bit unsigned integer,Range of values 0~4294967295
VSTR	A character string composed of printable characters

Object properties RO：read-only，RW：Read-write， CONST：constant(read-only)

Communication profile parameters DS 301

Index	Sub-Index	Name	Type	Attr	Explain
1000	0	Equipment type	U32	RO	
1001	0	Fault register	U8	RO	
1003	0	Cumulative failure number	U8	RW	
	1	Recently the first failure	U32	RO	
	2	The recent second failure	U32	RO	
	…	…	…	…	
	4	The recent fourth failure	U32	RO	
1005	0	SYNC message identifier	U32	RW	Default value 80H
1008	0	Device name	VSTR	CONST	
1009	0	Hardware version	VSTR	CONST	
100A	0	Software version	VSTR	CONST	
100C	0	Guard time	U16	RW	Life guardingThe life time of life Guardian agreement= guard time(ms)* Life time factor
100D	0	Life time factor	U8	RW	
1010	0	Storage parameter	U8	RO	
	1	Store all parameters	U32	RW	
	2	Storage communication parameters	U32	RW	
	3	Storage application parameters	U32	RW	
	4	Storage driver parameters	U32	RW	
1011	0	Restore default parameters	U8	RO	
	1		U32	RW	
	2		U32	RW	
	3		U32	RW	
	4		U32	RW	
1014	0	EMCY message identifier	U32	RW	Default value 80H+Node ID
1016	0		U8	RO	Heartbeat heartbeat protocol
	1	Consumer heartbeat time	U32	RW	
1017	0	Producer heartbeat time	U16	RW	
1018	0	Identification object	U8		
	1	Vendor identification	U32	RO	
	2	Product code	U32	RO	
	3		U32	RO	
	4		U32	RO	
1400	0	RPDO1 communication parameters	U8	RO	
	1	RPDO1 message identifier	U32	RW	Default value 200H+Node ID
	2	RPDO1 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	RPDO1 ban time	U16	RW	
	5	RPDO1 event timer	U16	RW	
1401	0	RPDO2 communication parameters	U8	RO	
	1	RPDO2 message identifier	U32	RW	Default value 300H+Node ID
	2	RPDO2 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	RPDO2 ban time	U16	RW	
	5	RPDO2 event timer	U16	RW	
1402	0	RPDO3 communication parameters	U8	RO	

Index	Sub-Index	Name	Type	Attr	Explain
	1	RPDO3 message identifier	U32	RW	Default value 400H+Node ID
	2	RPDO3 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	RPDO3 ban time	U16	RW	
	5	RPDO3 event timer	U16	RW	
1403	0	RPDO4 communication parameters	U8	RO	
	1	RPDO4 message identifier	U32	RW	Default value 500H+Node ID
	2	RPDO4 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	RPDO4 ban time	U16	RW	
	5	RPDO4 event timer	U16	RW	
1600	0	RPDO1 mapping parameters	U8	RO	Default 1， Only 1 map entry。
	1	RPDO1 map entry 1	U32	RO	Default value 60400010H (6040H Control word)
1601	0	RPDO2 mapping parameters	U8	RO	Default value 2,Only 2 map entry.
	1	RPDO2 map entry 1	U32	RO	Default value 60400010H (6040H Control word)
	2	RPDO2 map entry 2	U32	RO	Default value 60420010H (6042H Given speed)
1602	0	RPDO3 mapping parameters	U8	RO	Default value 1,Only 1 map entry.
	1	RPDO3 map entry 1	U32	RW	Default value 401C0210H (parameter 28.02 Local speed setting)
	2	RPDO3 map entry 2	U32	RW	Default value 0
	3	RPDO3 map entry 3	U32	RW	Default value 0
	4	RPDO3 map entry 4	U32	RW	Default value 0
1603	0	RPDO4 mapping parameters	U8	RO	Default value 0
	1	RPDO4 map entry 1	U32	RW	Default value 0
	2	RPDO4 map entry2	U32	RW	Default value 0
	3	RPDO4 map entry 3	U32	RW	Default value 0
	4	RPDO4 map entry 4	U32	RW	Default value 0
1800	0	TPDO1 communication parameters	U8	RO	
	1	TPDO1 message identifier	U32	RW	Default value 180H+Node ID
	2	TPDO1 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	TPDO1 ban time	U16	RW	Default value 0
	5	TPDO1 event timer	U16	RW	Default value 0
1801	0	TPDO2 communication parameters	U8	RO	
	1	TPDO2 message identifier	U32	RW	Default value 280H+Node ID
	2	TPDO2 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	TPDO2 ban time	U16	RW	Default value 0
	5	TPDO2 event timer	U16	RW	Default value 0
1802	0	TPDO3 communication parameters	U8	RO	
	1	TPDO3 message identifier	U32	RW	Default value 380H+Node ID
	2	TPDO3 transport type	U8	RW	Default value 255(Asynchronous

Index	Sub-Index	Name	Type	Attr	Explain
					transfer)
	3	TPDO3 ban time	U16	RW	Default value 0
	5	TPDO3 event timer	U16	RW	Default value 0
1803	0	TPDO4 communication parameters	U8	RO	
	1	TPDO4 message identifier	U32	RW	Default value 480H+Node ID
	2	TPDO4 transport type	U8	RW	Default value 255(Asynchronous transfer)
	3	TPDO4 ban time	U16	RW	Default value 0
	5	TPDO4 event timer	U16	RW	Default value 0
1A00	0	TPDO1 mapping parameters	U8	RO	Default value 1,Only 1 map entry.
	1	TPDO1 map entry 1	U32	RO	Default value 60410010H (6041H Status word)
1A01	0	TPDO2 mapping parameters	U8	RO	Default value 2,Only 2 map entry.
	1	TPDO2 map entry 1	U32	RO	Default value 60410010H (6041H Status word)
	2	TPDO2 map entry 2	U32	RO	Default value 60440010H (6044H Motor speed)
1A02	0	TPDO3 mapping parameters	U8	RO	Default value 1,Only 1 map entry.
	1	TPDO3 map entry 1	U32	RW	Default value 40010010H (parameter 01.00 Motor speed)
	2	TPDO3 map entry 2	U32	RW	Default value 0
	3	TPDO3 map entry 3	U32	RW	Default value 0
	4	TPDO3 map entry 4	U32	RW	Default value 0
1A03	0	TPDO4 mapping parameters	U8	RO	Default value 0
	1	TPDO4 map entry 1	U32	RW	Default value 0
	2	TPDO4 map entry 2	U32	RW	Default value 0
	3	TPDO4 map entry 3	U32	RW	Default value 0
	4	TPDO4 map entry 4	U32	RW	Default value 0

Drive and motion control device profile parameters of DSP 402

Index	Sub-Index	Name	Type	Attr	Explain
603F	0	Fault code	U16	RO	
6040	0	Control word	U16	RW	
6041	0	Status word	U16	RO	
6042	0	Given speed			
6043					
6044					
6046	0				
	1				
	2				
6047	0				
	1				
	2				
	3				
	4				
6048	0				
	1				

	2				
6049	0				
	1				
	2				
604A	0				
	1				
	2				
60FD	0	Switch input status			

Manufacturer specific parameters

Index	Sub-Index	Name	Type	Attr	Explain
4000	1	empty	U16	RW	
	2	Field bus control word	U16	RW	
	3	Field bus given 1	U16	RW	
	4	Field bus given 2	U16	RW	
	5	Field bus status word	U16	RO	
	6	Field bus actual value 1	U16	RO	
	7	Field bus actual value 2	U16	RO	
	8	Field bus module input 1	U16	RW	
	9	Field bus module input 2	U16	RW	
	…				
	19	Field bus module input 12	U16	RW	
	20	Field bus module output 1	U16	RO	
	21	Field bus module output 2	U16	RO	
	…				
	31	Field bus module output 12	U16	RO	

Parameter address	Index	Sub-Index	Type	Attr
1.00	4001	1	U16 or S16	RO
1.01	4001	2	U16 or S16	RO
…				
1.10	4001	11	U16 or S16	RO
…				
2.00	4002	1	U16 or S16	RO
…				
10.00	400A	1	U16 or S16	RW
…				
63.00	403F	1	U16 or S16	RW

Drive control

configuration parameter

10.00	Control ground 1 start function	5，field bus	5
10.11	Fault clearing input	P.06.05.08(Fieldbus control word, bit 8, reset)	P.06.05.08
21.00	Speed given 1	P.02.15(Field bus given 1)	P.02.15
50.00	Field bus enable	0,Prohibit 1,Enable	1
52.00	Node address	0-127	1
52.01	Baud rate	0，10kbit/s 1，20kbit/s 2，50kbit/s 3，125kbit/s 4，250kbit/s 5，500kbit/s 6，625kbit/s 7，800kbit/s 8，1000kbit/s	8
52.02	PDO4 Local	0,Prohibit	0

	configuration	1,Enable	
52.03	RPDO4 Enable	0,Prohibit 1,Enable	0
52.04	RPDO4 Transport type	0-255	255
52.05	RPDO4 Data 1 Indexes	0-65535	
52.06	RPDO4 Data 1 Sub index	0-255	
52.07	RPDO4 Data 2 Indexes	0-65535	
52.08	RPDO4 Data 2 Sub index	0-255	
52.09	RPDO4 Data 3 Indexes	0-65535	
52.10	RPDO4 Data 3 Sub index	0-255	
52.11	RPDO4 Data 4 Indexes	0-65535	
52.12	RPDO4 Data 4 Sub index	0-255	
52.13	TPDO4 Enable	0,Prohibit 1,Enable	0
52.14	TPDO4 Transport type	0-255	255
52.15	TPDO4 Event timing	0-65535	100
52.16	TPDO4 Data 1 Indexes	0-65535	
52.17	TPDO4 Data 1 Sub index	0-255	
52.18	TPDO4 Data 2 Indexes	0-65535	
52.19	TPDO4 Data 2 Sub index	0-255	
52.20	TPDO4 Data 3 Indexes	0-65535	
52.21	TPDO4 Data 3 Sub index	0-255	
52.22	TPDO4 Data 4 Indexes	0-65535	
52.23	TPDO4 Data 4 Sub index	0-255	
52.24	NMT state	0，Initialization 4，Disable 5，Enable 127,Standby	
52.25	CAN Error flag	0-65535	0
52.26	CAN Error count	0-65535	0
52.27	CANReceiving count	0-65535	0
52.28	CANSending count	0-65535	0
52.29	DSP402 state machine	0,Boot not ready 1,Ban start 2,Boot ready 3,Already started 4,Operation permission 5,Fault	1

52.30	Control word		
52.31	Status word		

Control word

No.	Name	Explain
0	Switch On	1：start-up,0：Stop according to the set mode
1	Disable Voltage	1：Keep the current state,0：Free stop .
2	Quick Stop	1：Keep the current state,0：Emergency stop.
3	Enable Operation	1：Allow work,0：Prohibition of work.
4	Ramp Out 0	1：RFG(Ramp function generator)Output force 0
5	Ramp Hold	1：RFG(Ramp function generator)Output hold
6	Ramp In 0	1：RFG(Ramp function generator)Output force 0
7	Reset Fault	0->1：Fault reset
8	Halt	1：Suspend
9	Inching 1	1：Point move command 1
10	Inching 2	1：Point move command 2
11	Remote	1：Remote control
12	Ext2	0：Select external control1, 1：Select external control 2
13-15	Retain	

Status word

No.	Name	Explain
0	Ready to Switch On	1：Boot ready
1	Switched On	1：Already started
2	Operation Enabled	1：Have been allowed to work
3	Fault	1：Fault
4	Voltage Disabled	1： Free stop
5	Quick Stop	1：Emergency stop
6	Switch On Disabled	1：Start inhibit
7	Warning	1：Warning
8	Ref Inverted	1：Set to negative
9	Remote	1：Remote control
10	Target Reached	1：Set speed has been reached
11	Internal Limit Active	1：Internal limit
12-15	Retain	

☞ Reminder：

Other fieldbus communication control such as Profibus-DP Match (set up)the instructions, please refer to the accessories of descriptions or consult relevant technical personnel

■ 7. Fault tracking and processing

Contents of this chapter

This chapter lists all of the alarm (warning) and fault information,Including possible causes and corrective actions.Alarm / fault code is displayed on the driver's control keyboard (LED Version display in the form of E-XX).Alarm or fault information is used to indicate that the driver is in an abnormal state.Most alarms and faults can be identified and corrected using the information in this chapter.If you can not rule out the fault,Please contact our representative office.In this chapter,Alarm and fault sort according to the code.

Security



Warning！ Only have the qualification of the electrical engineer is allowed to drive conduct for maintenance.Before starting to drive conduct operation,Must read the safety instructions in front of the relevant hardware manual.

How to reset

Can be controlled by pressing the keyboard (RESET key),Or cut off the power supply for a period of time to reset the fault.After troubleshooting,Motor can start again.

Fault code and interpretation

Code	Fault name	Possible causes	Terms of settlement
01	SC(Output short circuit)	Output phase to phase short circuit 、 Or output to earth short circuit、Or output to the bus short circuit.	Check whether the motor is short circuit、Check wiring and cable short circuit.Check whether there is a power factor compensation capacitor or surge absorber in the motor cable.
02	OC(Motor over current)	Motor current exceeds the maximum permissible level of hardware.	Check the motor rated parameters is consistent with the nameplate 、 Check the acceleration and deceleration time is too fast.
03	OV(Bus overvoltage)	Bus voltage exceeds the maximum permissible level.	Check whether the overpressure stall enable.Check whether the brake resistance is within the recommended range.
04	OH(Drive over heat)	Drive within the radiator temperature is too high、Or the internal cavity temperature is too high、Or module chip temperature is too high.	Check cooling fan、Ventilation cooling system is normal 、Radiator is dust clogging 、Check if the ambient temperature is within the allowable range.
05	GF(Earth leakage)	The sum of the output current is not zero,And greater than the allowable value.	Check wiring is loose、Check whether the motor cable leakage.Or the motor output line is too long and there is no additional output reactor.
06	ADC(ADC Fault)	Motor current sensor fault 、Analog to digital converter fault or control panel.	Contact local agents or vendors.

Code	Fault name	Possible causes	Terms of settlement
07	NTC LOSS(Temperature sensor break)	Drive internal temperature sensor disconnection.	Contact local agents or vendors.
08	ENC INIT	The encoder is found to be faulty during initialization.	Check the encoder wiring is correct,Check the encoder wiring is correct.
09	ENC ZMARK	The number of pulses between the two Z pulses captured by the encoder is different from that of the encoder.	Check encoder resolution settings are correct.Check whether the encoder cable is disturbed.
10	EEPROM	Memory failure,Failed write parameter.	Contact local agents or vendors.
11	CPU OVERLOAD	CPU load over 100%,Failure to complete real-time task.Or stack overflow.	Contact local agents or vendors.
12	PARA ERROR	The parameters of the motor are conflicting with each other。	Check motor parameters are set correctly.
13	MOTOR OH	The temperature of the motor exceeds the set fault point.	Check whether the motor is overloaded、Check motor overheating protection settings are correct.
14	AI LOSS	Analog input out set of range.	Check whether analog input is broken or short.
15	EXT FAULT	External user defined fault.	Check external fault signal。
16	SUPPLY LOSS	Abnormal power supply.Or lack of phase,Or unbalanced three-phase input, or insufficient capacity.	Check whether the lack of phase.Check whether the capacitance value is normal.
17	OUTPUT LOSS	Output current anomalyOr the output phase,or IGBT and peripheral anomalies can not be controlled.	Check whether the motor is short of phase.Check whether the motor vibration。Or contact local agents or vendors.
18	ID RUN	Motor self identification fault.	Check whether the motor has been connected.Check the motor nameplate parameters are set correctly.
19	MODBUS FAULT	MODBUS Communication failure.	Check MODBUS communication.
20	CANOPEN FAULT	CAN Communication failure.	Check CAN communication.
21	PROFIBUS FAULT	PROFIBUSCommunication failure.	Check PROFIBUS communication.
22	PAR SET ERR	Backup parameter set error in memory.	Parameter set not backup.
23	UNDER VOLTAGE	Drive operation,Power supply under pressure.	Check whether the power supply is normal.Check whether the soft start is normal.

Code	Fault name	Possible causes	Terms of settlement
24	SPEED FEEDBACK	Speed feedback fault.	Speed feedback speed feedback phase disconnection or positive feedback.
25	OVER SPEED	Overspeed.	Motor speed,Check encoder settings are correct,Check whether the feedback is positive feedback.
26	OPTCARD CHANGED	Hot swap card options.	Do not allow the hot swap option card,Otherwise it may cause permanent damage to the driver.
27	RUNTIME LIMITTED	Run time is limited.	Contact local agents.
28	PID FBK LOSS	Process PID feedback break.	Check whether the PID disconnection detection is correct,Check whether the external wire break.
29	BR ERR	The brake resistance is less than allowable resistance drive.	Check the brake resistance is reasonable.
30	BR OVERLOAD	Regenerative braking resistor.	Check the brake resistor overload detection settings are correct,Check whether the power of resistance is reasonable.
31	BRAKE SLIP	The brake during the inspection,Motor slip.	Check whether the need to replace the brake,Check the brake check settings are correct.
32	BRAKE FLT	Open the front brake,Start moment can not be reached.	Check whether the normal brake.
33	BRAKE SAFE CLOSE	Open loop control,The motor works in the low speed dangerous area,Brake force close.	Check whether speed given is too low.
34	BRAKE OL	After the brake open,Actual compliance exceeds the maximum allowable torque of the drive.	Check whether the load is too high，Check the brake control circuit is normal.
35	BRAKE ACK FLT	After the brake open,Non response signal.	Check the brake response signal is normal.
36	BRAKE SYNC FLT	Lifting control,Motor speed and the given estimated deviation is too large,Magnetic flux anomaly.	Check motor parameters are set correctly.
40	PM SYNC LOSS	Multiple step out of step in the starting process of synchronous motor.	Check whether the initial angle identification parameter is set correctly
41	MOTOR STALL	Motor blocking fault，The rotor is almost impossible to rotate,The moment has reached the maximum torque.	Check if the machine is locked

■ 8.More information

Product and service consulting

The user would like to know any more information about this product,Can contact with our local representative office,Please provide the serial number of the product and the serial number of the product to be consulted.

Provide feedback about this manual

Welcome you to our manual put forward valuable suggestions,Contact with our local representative office,Or call our customer service phone directly.

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Shenzhen Cumark New Technology Co., Ltd.
Address: Hongfa Industrial Park, Tangtou Community, Shiyan Town, Bao'an District, Shenzhen
Postal code: 518108
Tel.:0755-81785111
Fax.:0755-81785108
Hotline.: (+86) 400 619 2001
Website: www.cumark.com.cn