INOVANCE

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SV670P Series Servo Drive

Commissioning Guide

Industrial Automation

Intelligent Elevator

New Energy Vehicle

Industrial Robot

Rail Transit

Data code 19011856 A02

Preface

Introduction

Thank you for purchasing the SV670P series servo drive developed by Inovance.

The SV670P series servo drive is a high-end servo drive designed based on global-leading standards and high-end application needs. It is featured with high speed, high precision, high performance, and tuning-free Function.

The servo drive covers a power range from 0.05 kW to 7.5 kW and carries Modbus communication interfaces to work with the host controller for a networked operation of multiple servo drives. The drive comes with the ITune function which supports adaptive stiffness level setting, inertia auto-tuning, and vibration suppression for easy use. The servo drive, together with an MS1 series high-response servo motor (with ultra-low, low or medium inertia) equipped with a 23-bit single-turn/multi-turn absolute encoder, serve to deliver a quiet and stable operation and accurate process control through the fully closed-loop function and internal process segment function.

The drive also offers dynamic braking. The drive aims to achieve quick and accurate position control, speed control, and torque control through high-performance solutions for automation equipment in such industries as electronic manufacturing, lithium batteries, manipulators, packaging, and machine tools.

This manual presents drive commissioning, parameter descriptions, including the operating panel, commissioning software, commissioning procedure and a parameter list.

More Documents

Name	Data Code	Description
SV670P Series Servo Drive Selection Guide	19011852	Provides instructions on product selection, including the list of supporting components, technical data on the drive and motor, and the selection guide of cables.
SV670P Series Servo Drive installation Guide	19011868	Presents installation of the servo drive, including installation steps, , mechanical installation, and electrical installation.
SV670P Series Servo Drive Hardware Guide	19011854	Presents electrical design guidance of the equipment, description of terminals, required certificates and standards and solutions to common EMC problems.
SV670P Series Servo Drive Commissioning Guide	19011856	Presents servo commissioning, parameter descriptions, including the operating panel, commissioning software, commissioning procedure and a parameter list.

Name	Data Code	Description
SV670P Series Servo Drive Function Guide	19011866	Presents functions and parameters, including function overview, basic servo functions, adjustment and parameter list.
SV670P Series Servo Drive Communication Guide	19011871	Presents functions and parameters of the servo drive, including Modbus communication configuration, parameter descriptions, and communication application cases.
SV670P Series Servo Drive Troubleshooting Guide	19011869	Introduces faults and fault levels, the troubleshooting process, warning codes and fault codes.
SV670P Series Servo Drive Maintenance Guide	19011870	Provides instructions on maintenance and repair of the equipment.
SV670P Series Servo Drive Safety Guide	19011867	Presents the safety function and related certifications and standards, wiring, commissioning process, troubleshooting, and functions.
SV670P Series Servo Drive Manual Package	PS00005526	Provides information on selection, installation, commissioning, function, troubleshooting and parameters of the equipment.

Revision History

Date of Revision	Version	Description
2022-06	A02	• Updated description of some parameters. • Updated the schematic diagram of the drive.
2022-05	A01	• Changed to the second gain condition. • Replaced the "Braking resistor selection flowchart" in section 2.2.4.
2022-03	A00	First release.

Document Acquisition

This manual is not delivered with the product. You can obtain the PDF version by visiting:

- *http://www.inovance.com*.
- Scan the QR code on the equipment to acquire more.

Table of Contents

General Safety Instructions

Safety Precautions

- This section explains the safety precautions that need to be observed to use this product correctly. Before using this product, please read the instruction manual and correctly understand the relevant information of safety precautions. Failure to comply with the safety precautions may result in death, serious injury, or equipment damage.
- "CAUTION", "WARNING", and "DANGER" items in the guide only indicate some of the precautions that need to be followed; they just supplement the safety precautions.
- Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injuries or property damage caused by improper use.

Safety Levels and Definitions

DANGER	Indicates that failure to comply with the notice will result in death or severe personal injuries.
WARNING	Indicates that failure to comply with the notice may result in death or severe personal injuries.
CAUTION	Indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage.

General Safety Instructions

- Drawings in the selection guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions. Install the covers or protective guards as specified, and use the equipment in accordance with the instructions described in the user guide.
- The drawings in the guide are shown for illustration only and may be different from the product you purchased.

Unpacking
⚠ WARNING • Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking. • Do not install the equipment if you find water seepage or missing or damaged components upon unpacking. • Do not install the equipment if you find the packing list does not conform to the equipment you received.
⚠ CAUTION • Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking. • Unpack the package by following the unpacking sequence. Do not strike the package violently. • Check whether there is damage, rust, or injuries on the surface of the equipment and equipment accessories before unpacking. • Check whether the package contents are consistent with the packing list before unpacking.
Storage and Transportation
⚠ WARNING • Large-scale or heavy equipment must be transported by qualified professionals using specialized hoisting equipment. Failure to comply may result in personal injuries or equipment damage. • Before hoisting the equipment, ensure the equipment components such as the front cover and terminal blocks are secured firmly with screws. Loosely-connected components may fall off and result in personal injuries or equipment damage. • Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment. • When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.

CAUTION

- Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage.
- When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries.
- Store and transport the equipment based on the storage and transportation requirements. Failure to comply will result in equipment damage.
- Avoid storing or transporting the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Avoid storing the equipment for more than three months. Long-term storage requires stricter protection and necessary inspections.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport the equipment with other equipment or materials that may harm or have negative impacts on this equipment.

Installation

DANGER

- The equipment can be operated by well-trained and qualified professionals only. Non-professionals are not allowed.

WARNING

- Read through the guide and safety instructions before installation.
- Do not install this equipment in places with strong electric or magnetic fields.
- Before installation, check that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock.
- When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire.
- Do not retrofit the equipment.
- Do not fiddle with the bolts used to fix equipment components or the bolts marked in red.
- When the equipment is installed in a cabinet or final assembly, a fireproof enclosure providing both electrical and mechanical protections must be provided. The IP rating must meet IEC standards and local laws and regulations.
- Before installing devices with strong electromagnetic interference, such as a transformer, install a shielding device for the equipment to prevent malfunction.
- Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply will result in a fire.

CAUTION

- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes.
- Resonance may occur when the equipment operating at a constant speed executes variable speed operations. In this case, install the vibration-proof rubber under the motor frame or use the vibration suppression function to reduce resonance.

Wiring

DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Before wiring, cut off power connections with all equipment. Residual voltage exists after power cut-off. Therefore, wait at least the time designated on the equipment warning label before further operations. Measure the DC voltage of the main circuit and make sure it is below the safe voltage, otherwise there will be the danger of electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power ON. Failure to comply will result in an electric shock.
- Check that the equipment is grounded properly. Failure to comply will result in an electric shock.

WARNING

- Do not connect the input power supply to the output end of the equipment. Failure to comply will result in equipment damage or even a fire.
- When connecting a drive to the motor, check that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation.
- Cables used for wiring must meet cross sectional area and shielding requirements. The shield of the cable must be reliably grounded at one end.
- Fix the terminal screws with the tightening torque specified in the user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire.
- After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in an electric shock or equipment damage.

CAUTION

- During wiring, follow the proper electrostatic discharge (ESD) procedure, and wear an antistatic wrist strap. Failure to comply will damage the equipment or the internal circuits of the equipment.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply will result in equipment malfunction.

Power-on

DANGER
• Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted. • Check that the power supply meets equipment requirements before power-on to prevent equipment damage or a fire. • After power-on, do not open the cabinet door or protective cover of the equipment, touch any terminal, or disassemble any unit or component of the equipment. Failure to comply will result in an electric shock.
WARNING
• Perform a trial run after wiring and parameter setting to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage. • Before power-on, make sure that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may resulting in a fire. Failure to comply may result in a fire. • Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in death or personal injuries.
Operation
DANGER
• The equipment must be operated only by professionals. Failure to comply will result in death or personal injuries. • Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply will result in an electric shock.
WARNING
• Do not touch the equipment casing, fan, or resistor with bare hands to feel the temperature. Failure to comply may result in personal injuries. • Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.
Maintenance
DANGER
• Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals. • Do not maintain the equipment with power ON. Failure to comply will result in an electric shock. • Before maintenance, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label. • In case of a permanent magnet motor, do not touch the motor terminals immediately after power-off because the motor terminals will generate induced voltage during rotation even after the equipment power supply is off. Failure to comply will result in an electric shock.

⚠ WARNING • Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.
Repair
⚠ DANGER • Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals. • Do not repair the equipment with power ON. Failure to comply will result in an electric shock. • Before inspection and repair, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.
⚠ WARNING • Submit the repair request according to the warranty agreement. • When the fuse is blown or the circuit breaker or earth leakage current breaker (ELCB) trips, wait for at least the time designated on the equipment warning label before power-on or further operations. Failure to comply may result in death, personal injuries or equipment damage. • When the equipment is faulty or damaged, the troubleshooting and repair work must be performed by professionals that follow the repair instructions, with repair records kept properly. • Replace quick-wear parts of the equipment according to the replacement instructions. • Do not use damaged equipment. Failure to comply may result in death, personal injuries, or severe equipment damage. • After the equipment is replaced, check the wiring and set parameters again.
Disposal
⚠ WARNING • Dispose of retired equipment in accordance with local regulations and standards. Failure to comply may result in property damage, personal injuries, or even death. • Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution.

Additional Precautions

Cautions for the dynamic brake

- Dynamic braking can only be used for emergency stop in case of failure and sudden power failure. Do not trigger failure or power failure frequently.
- Ensure that the dynamic braking function has an operation interval of more than 5 minutes at high speed, otherwise the internal dynamic braking circuit may be damaged.

- Dynamic braking is common in rotating mechanical structures. For example, when a motor has stopped running, it keeps rotating due to the inertia of its load. In this case, this motor is in the regenerative state and short-circuit current passes through the dynamic brake. If this situation continues, the drive, and even the motor, may be burned.

Safety Label

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. See the following table for descriptions of the safety labels.

Safety Label	Description
	• Never fail to connect the protective earth (PE) terminal. Read through the guide and follow the safety instructions before use. • Never fail to connect Protective Earth (PE) terminal. Read the manual and follow the safety instructions before use. • Do not touch terminals within 15 minutes after disconnecting the power supply to prevent the risk of electric shock. • Do not touch terminals with 15 minutes after Disconnect the power. Risk of electrical shock. • Do not touch the heatsink with power ON to prevent the risk of burn. • Do not touch heatsink when power is ON. Risk of burn.

1 Commissioning Tool

1.1 操作面板

1.1.1 Components of Servo Drives and Servo Motors

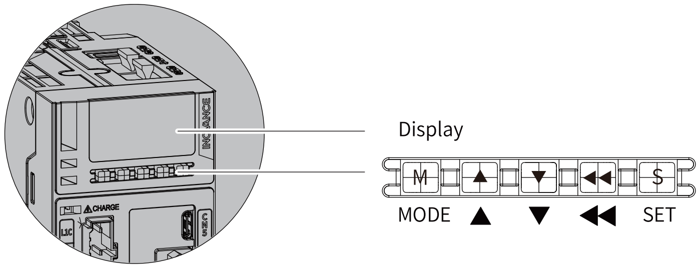


Figure 1-1 Magnified view of the keypad

The operation panel of the SV670P Series servo drive consists of an LED (5-digit, 8-segment) and five buttons. The keypad is used for value display, parameter setting, user password setting and general function execution. The following table takes parameter setting as an example to describe the general functions of the keys.

Table 1–1 Descriptions of keys

Name	Symbol	Description
MODE	M	Switches among different modes. Returns to the previous menu.
UP	▲	Increases the value of the blinking digit for the LED.
DOWN	▼	Decreases the value of the blinking digit for the LED.
SHIFT	◀◀	Shifts the blinking digit for the LED. You can view the high digits of the number consisting of more than 5 digits.
SET	S	Switches to the lower-level menu. Executes commands such as storing parameter setting value.

1.1.2 Operation Panel Display

The keypad can be used to display the servo drive status, parameters, faults, and monitored values.

- Status display: Displays current servo drive status, such as servo ready or servo running.
- Parameter display: Displays parameters and their setpoints
- Fault display: Displays faults and warnings that occurred on the servo drive.
- Monitored value display: Displays values of monitoring parameters.

Display mode switchover

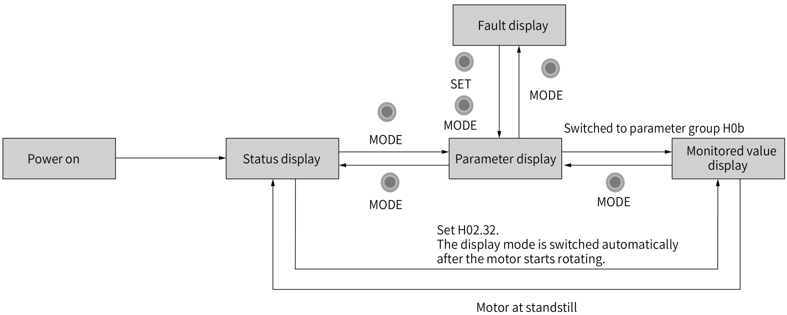


Figure 1-2 Switchover among different display modes

- The keypad enters status display immediately upon power-on.
- Press MODE to switch among different display modes based on the conditions shown in *"Figure 1–2 " on page 14* .
- In status display, set H02.32 to select the parameter to be monitored. When the motor rotates, the keypad automatically switches to monitored value display. After the motor stops, the keypad automatically returns to status display.
- In the parameter display mode, after you select the parameter to be monitored in group H0B, the keypad switches to monitored value display.
- Once a fault occurs, the keypad switches to fault display immediately, with all the five LEDs blinking. Press SET to stop the LEDs from blinking, and then press MODE to switch to parameter display.

Status display

Display	Name	Applicable Occasion	Meaning
	Reset Servo initializing	At the moment upon power on	The servo drive is in the initialization or reset status. After initialization or reset is done, the servo drive automatically switches to other status.
	Nrd.x Servo not ready	Initialization done, but servo drive not ready	The servo drive is not ready to run because the main circuit is not powered on. For details, see Chapter "Troubleshooting". Meaning of "x" • 1: Control circuit undervoltage • 2: Main circuit power input error • 3: Bus undervoltage • 4: Pre-charge resistor not bypassed • 5: Encoder initialization not done • 6: Detection on short circuit to ground failed
	Rdy Ready	Servo drive ready	The servo drive is ready to run and waits for the S-ON signal.
	Run Running	Servo ON (S-ON) signal activated (S-ON signal switched on)	The servo drive is running.
	JOG Jog	Servo drive in jog status	See section Jogging for details.

SV670C operation panel display

Display	Name	Applicable Occasion	Meaning
	First digit: 1–9 Communication state	-	Displays the status of the slave CANopen state machine in the form of characters. • 1: Initialization • 2: Pre-operational • 8: Operational • 9: Stop
	Second digit: 0–7 Control mode	-	Displays present operating mode of the servo drive in hexadecimal, without blinking. • 0: Local mode • 1: Profile position control • 3: Profile velocity mode • 4: Profile torque mode • 6: Homing mode • 7: Interpolation mode
	81nr.x servo not ready	Initialization done, but servo drive not ready	The servo drive is not ready to run because the main circuit is not powered on. For details, see Chapter "Troubleshooting". Meaning of "x" • 1: Control circuit undervoltage • 2: Main circuit power input error • 3: Bus undervoltage • 4: Pre-charge resistor not bypassed • 5: Encoder initialization not done • 6: Detection on short circuit to ground failed

Parameter Display

Parameters are divided into groups H00...H34 based on functions. Parameters can be located quickly based on the parameter group they belong to. For details on parameters, See section Description of Parameters.

- Parameter Display

Display	Name	Description
HXX.YY	Param. No.	XX: Parameter group No. (decimal) YY: Offset within the parameter group (hexadecimal)

For example, "H02.00" is displayed as follows.

Display	Name	Description
	H02.00	02: Parameter group No. 00: Offset within the parameter group

- Display of negative numbers and numbers with different lengths
  - Signed number with 4 digits and below or unsigned number with 5 digits and below

    Such numbers are displayed in a single page (five digits). For signed numbers, the highest bit "-" represents the negative symbol.

    For example, "-9999" is displayed as follows.

    For example, "65535" is displayed as follows.

  - Signed number with more than 4 digits or unsigned number with more than 5 digits

    Such numbers are displayed from low to high bits in several pages (5 digits per page): current page + values on current page, as shown in the following figure. Hold down ◀◀ for more than 2s to switch to the next page.

    For example, "-1073741824" is displayed as follows.

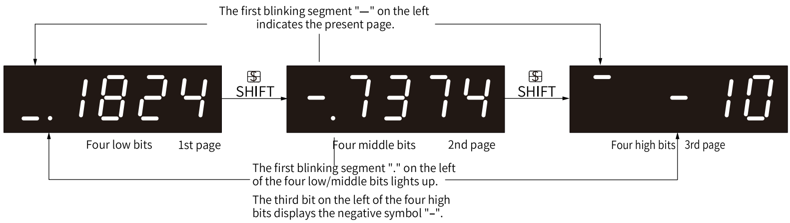


Figure 1-3 Display of "-1073741824"

Example: "1073741824" is displayed as follows:

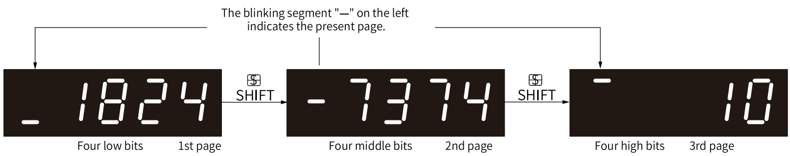


Figure 1-4 Display of "1073741824"

- Display of the decimal point
  The segment "." of the ones indicates the decimal point, which does not blink.

Display	Name	Description
	Decimal point	1000.0

- Display of parameter setting status

Display	Name	Applicable Occasion	Meaning
	Done (parameter setting done)	The parameter is set successfully.	The parameter is set and saved to the servo drive (Done). The servo drive can execute other operations.
	F.InIt (restored to default)	Parameter initialization is in progress (H02.31 = 1).	The servo drive is in the process of parameter initialization. Switch on the control circuit again after initialization is done.
	Error	The user password (H02.30) is activated and the password entered is wrong.	A wrong password is entered. You need to enter the password again.

Fault Display

- The keypad can be used to display present or previous fault and warning codes. For analysis and solutions to the faults and warnings, see Chapter "Troubleshooting".
- When a fault or warning occurs, the keypad displays the corresponding fault or warning code immediately. When multiple faults or warnings occur, the keypad displays the fault code of the highest fault level.
- You can select the previous fault/warning to be viewed through H0b.33 and view the code of the selected fault/warning in H0b.34.
- You can clear the latest 20 faults or warnings saved in the servo drive by setting H02.31 to 2.

For example, E941.0 is displayed as follows:

Display	Name	Description
	E941.0 Warning code	E: A fault or warning occurs on the servo drive. 941.0: Warning code

Monitored value display

- Group H0b: Displays parameters used to monitor the operating state of the servo drive.
- Set H02.32 (Default keypad display) properly. After the motor operates normally, the keypad switches from status display to parameter display. The parameter group number is H0b and the offset within the group is the setpoint of H02.32.

For example, if H02.32 is set to 00 and the motor speed is not 0 rpm, the keypad displays the value of H0b.00.

The following table describes the monitoring parameters in H0b.00.

Param. No.	Name	Unit	Meaning	Example of Display
H0b.00	Motor speed actual value	rpm	Displays the actual value of the motor speed after round-off, which can be accurate to 1rpm.	3000 rpm:  -3000 rpm: 

1.1.3 Parameter Settings

Example of parameter settings

You can set parameters through the keypad. For details on parameters, see Chapter "List of Parameters". The following figure shows how to switch from position control mode to speed control mode using the keypad after power-on.

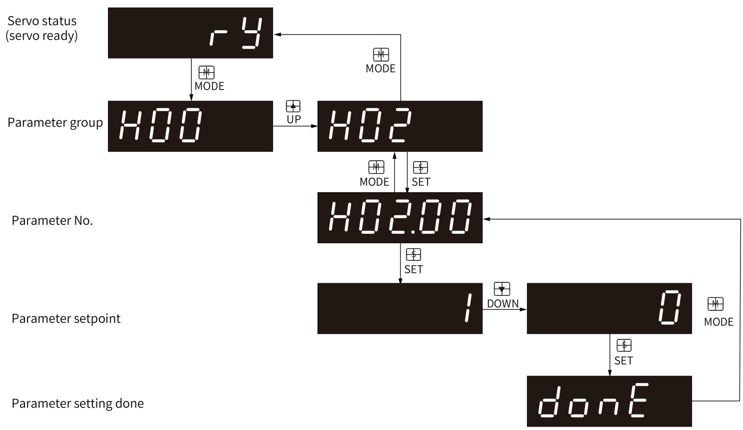


Figure 1-5 Example of parameter setting

- MODE: Used to switch the keypad display mode and return to the previous interface.
- UP/DOWN: Used to increase or decrease the value of the blinking digit.
- SHIFT: Used to shift the blinking digit.
- SET: Used to save the present setpoint or switch to the next interface.

After parameter setting is done, that is, "donE" is displayed on the keypad, press MODE to return to the parameter interface (interface of "H02.00").

Forced DI/DO signals

You can assign different functions to DI/DOs by setting parameters in groups H03 and H04 through the keypad (or host controller), so that the host controller can control the servo functions through DI signals or use the DO signals outputted by the servo drive.

The servo drive also provides forced DI/DO functions. The forced DIs can be used to test the DI functions of the servo drive, and the forced DOs can be used to check the DO signal connection between the host controller and the servo drive.

When the forced DI/DO function is used, the logics of both physical DI and virtual DI are determined by the forced DI.

Forced DI signal input

After this function is enabled, all DI signal levels are controlled by the forced DI setting (H0d.18), independent of external DI signal status.

- Operating process

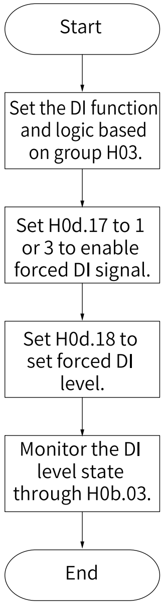


Figure 1-6 Procedure for setting forced DI function

H0d.18 is used to set the forced DI input. The keypad displays the value in hexadecimal. After the hexadecimal value is converted to a binary value, the value "1" indicates high level and "0" indicates low level.

Note

- The DI logic is defined by parameters in group H03.
- H0b.03 is used to monitor the DI level status. The keypad displays the level, and the value of H0b.03 (Monitored DI signal) read in the software tool is a decimal.

Related parameters:

See *" H0d.17" on page 281* for details.

- Example:
  To activate the functions assigned to DI1, DI6, and DI7 and deactivate the functions assigned to DI2...DI5 and DI8, set as follows (the logic of DI1...DI8 is "active low", in which the value 1 indicates high level and 0 indicates low level).

  The corresponding binary value and hexadecimal value are "10011110" and "9E" respectively. Therefore, set H0d.18 to "9E" through the keypad.

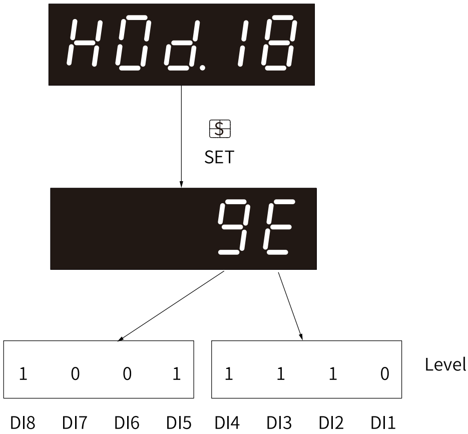


Figure 1-7 Meaning of the H0d.18 setpoint

Note

- If the DI function is normal, the displayed value of H0b.03 is always the same as that of H0d.18.
- In this case, DI1, DI6, and DI7 are displayed as low level, and DI2...DI5 and DI8 are displayed as high level. The value of H0b.03 read in the software tool is 158 (decimal).

Monitoring the DI level status through H0b.03. The keypad displays as follows:

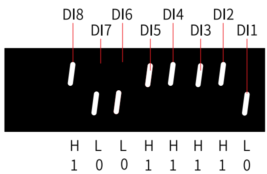


Figure 1-8 DI level status corresponding to H0b.03

Note

Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0")

- Exit

The forced DI signal function is not retentive upon power-off. Normal DIs apply after restart, or you can set H0d.17 to 0 (No operation) to return to the normal DI mode.

Forced DO function

After this function is enabled, all DO signal levels are controlled by H0d.19 (Forced DO value), regardless of the internal DO status of the servo drive.

1. Operating process

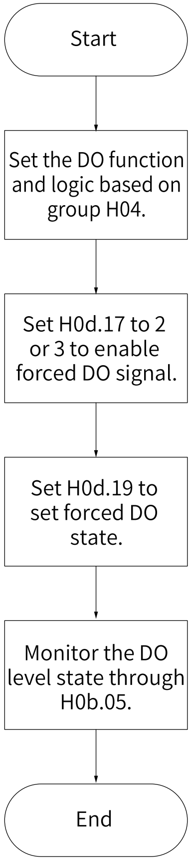


Figure 1-9 Procedure for setting forced DO function

H0d.19 (Forced DO value) is used to set whether the DO function is active. The keypad displays the value in hexadecimal. After the hexadecimal value is converted to a binary value, the value "1" indicates the DO function is active and "0" indicates the DO function is inactive.

The DO logic is defined by parameters in group H04. H0b.05 is used to monitor the DO level status. The keypad displays the level, and the value of H0b.05 (monitored DO signal) read in the software tool is decimal.

2. Example:
To activate the DO function assigned to DO1 and deactivate DO functions assigned to DO2 and DO5, set as follows:

As the value "1" indicates the DO function is active and "0" indicates the DO function is inactive, the binary value is "11110", which corresponds to the hexadecimal value "1E". Therefore, set H0d.19 (Forced DO value) to 1E through the keypad.

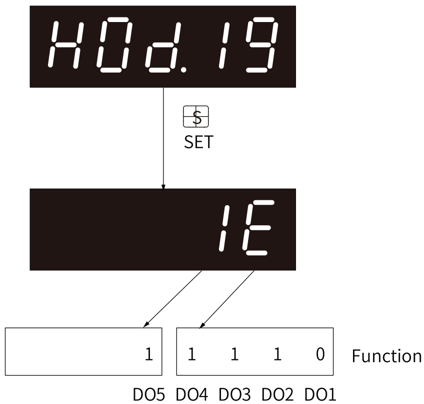


Figure 1-10 Meaning of the H0d.19 setpoint

Monitoring the DO level status through H0b.05:

If the logic of all the three DO terminals are "active at low level", the DO1 terminal is high level and DO2 to DO5 terminals are low level, and the corresponding binary number is "00001". In this case, the value of H0b.05 (Monitored DO signal) read by the software tool is 1 (decimal). The keypad displays as follows:

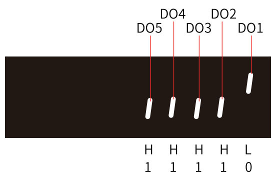


Figure 1-11 Display H0b.05 when all DO are "active low"

If the logic of all the 5 DO terminals are "active high", the DO1 terminal is low level and DO2 to DO5 terminals are high level, and the corresponding binary number is "11110". In this case, the value of H0b.05 (Monitored DO signal) read by the software tool is 30 (decimal). The keypad displays as follows:

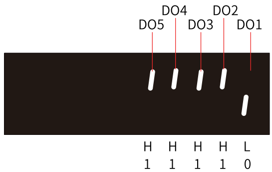


Figure 1-12 Display H0b.05 when all DO are "active high"

3. Exit

The forced DO signal function is not retentive upon power-off. Normal DOs apply after restart, or you can set H0d.17 to 0 (No operation) to return to the normal DO mode.

Bus control forced DO function

The function of the corresponding DO is set to 31. After this function is enabled, all DO signal levels are controlled by 60FE.01h (Physical output) and are unrelated to the internal DO signal status.

- Operating process

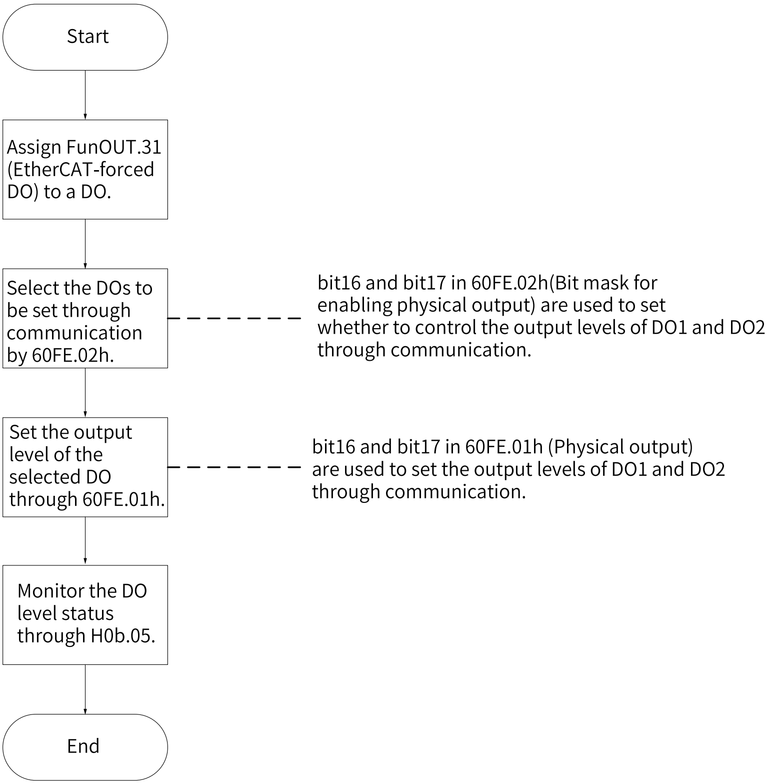


Figure 1-13 Procedure for setting bus control forced DO function

60FEh (Digital output) can be used to forcibly set the DO terminal level through the bus, regardless of the internal DO status of the drive.

bit	Related DO	Output mask: 60FE.02h	Physical output: 60FE.01h
16	DO1	1: DO3 forced output enabled	DO1 forced output (0: OFF, 1: ON)
17	DO2	1: DO3 forced output enabled	DO2 forced output (0: OFF, 1: ON)
18	DO3	1: DO2 forced output enabled	DO3 forced output (0: OFF, 1: ON)
19	DO4	1: DO4 forced output enabled	DO4 forced output (0: OFF, 1: ON)
20	DO5	1: DO5 forced output enabled	DO5 forced output (0: OFF, 1: ON)

When bit16–bit20 of 60FE.02h and 60FE.01h are all set to 1, the corresponding forced DO is ON.

H0b.05 is used to monitor the DO level status. The keypad displays the level, and the value of H0b.05 (monitored DO signal) read in the software tool is hexadecimal.

Example: To make the output levels of DO1...DO5 be forcibly set by the bus, in which DO1 outputs low level and DO2 to DO5 output high level, set as follows:

Set 60FE.02h to 0x001F0000, and 60FE.01h to 0x00020000. Monitor the DO level status through H0b.05. The keypad displays as follows.

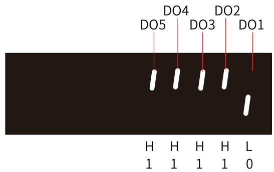


Figure 1-14 Display of H0b.05 when DO signals are controlled by the bus

- Disconnection logic

Table 1–2 Description of parameter H04.23 (CANopen forced DO disconnection)

Bit of H04.23	Description
0	1: No output in DO1 in the non-OP status
1	1: No output in DO2 in the non-OP status
2	1: No output in DO3 in the non-OP status
3	1: No output in DO4 in the non-OP status
4	1: No output in DO5 in the non-OP status

User password

After the user password (H02.30) is activated, only authorized operators can set parameters.

- Setting the user password
  The following figure shows how to set the user password to "00001".

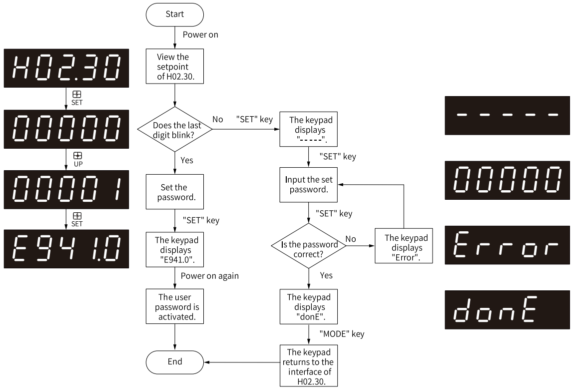


Figure 1-15 Procedure for setting the user password

To change the user password, input current password first to authorize the access to parameter setting. Next, enter H02.30 again to set a new password based on the procedure shown in the preceding figure.

Note

If the last bit does not blink, the access to parameters is password protected. If the last bit blinks, password is not needed or the password entered is correct.

- Canceling the user password

  Enter the set user password, and set H02.30 to "00000" to cancel the user password.

1.2 Software Tool

1.2.1 Installation

Introduction to the Software Tool

The software tool InoDriverShop can be downloaded from *http://www.inovance.com* for free.

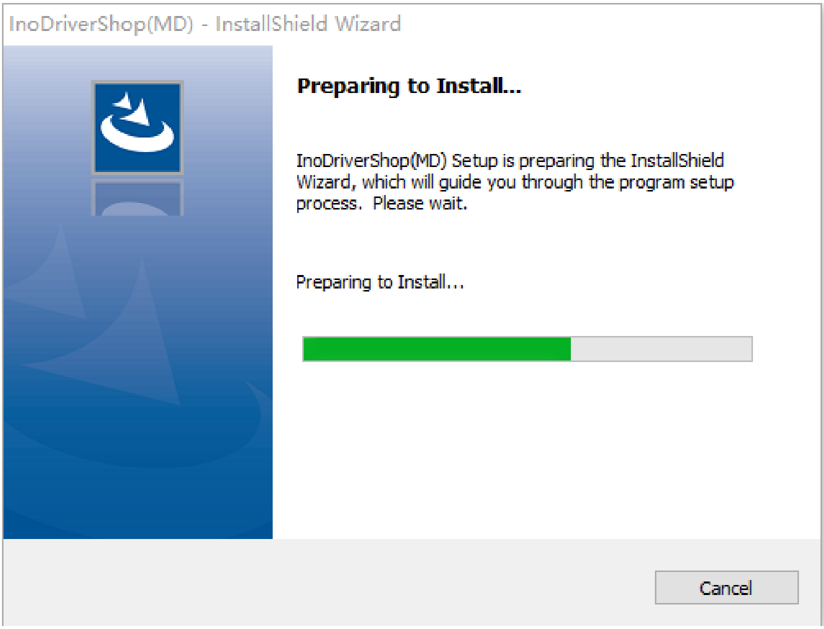
Use a Type-C communication cable for communication between SV670 series servo drives and the PC.

InoDriverShop supports 32-bit/64-bit Windows 7 and 64-bit Windows 10 operating systems. For details on how to use InoDriverShop, see the help document of InoDriverShop.

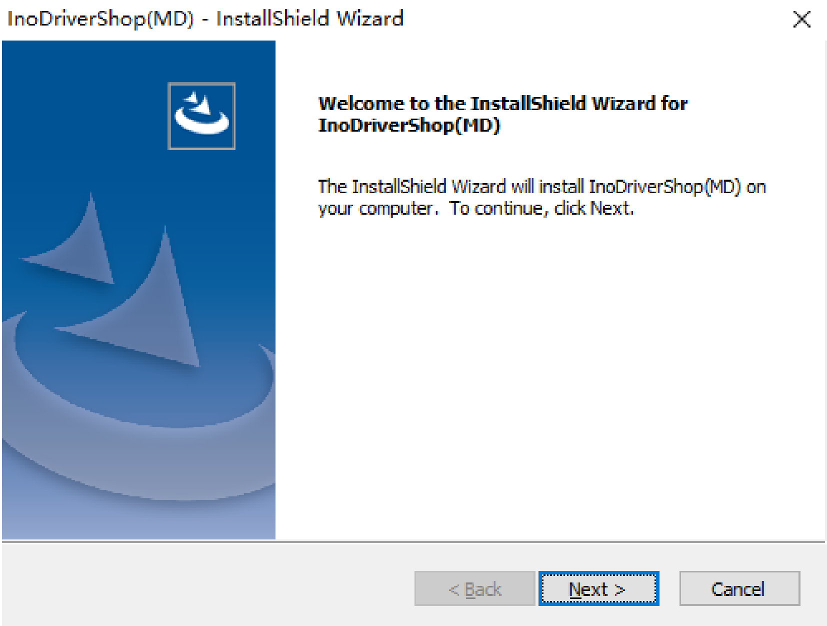
Installing InoDriverShop

1. Download InoDriverShop.
   a. Visit the official website of Inovance as shown below.
      Website: *http://www.inovance.com*.
   b. Choose "Support" > "Download", and then type in the keyword InoDriverShop and click "Search".
   c. Click **Download**.
2. Unzip the package downloaded.
3. Click 

to start installing InoDriverShop.

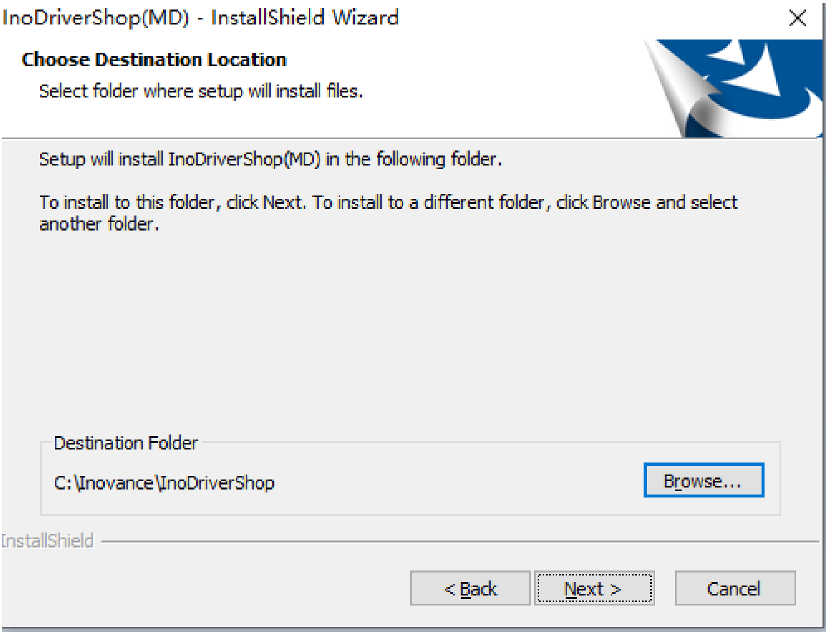


4. Click **Next**.

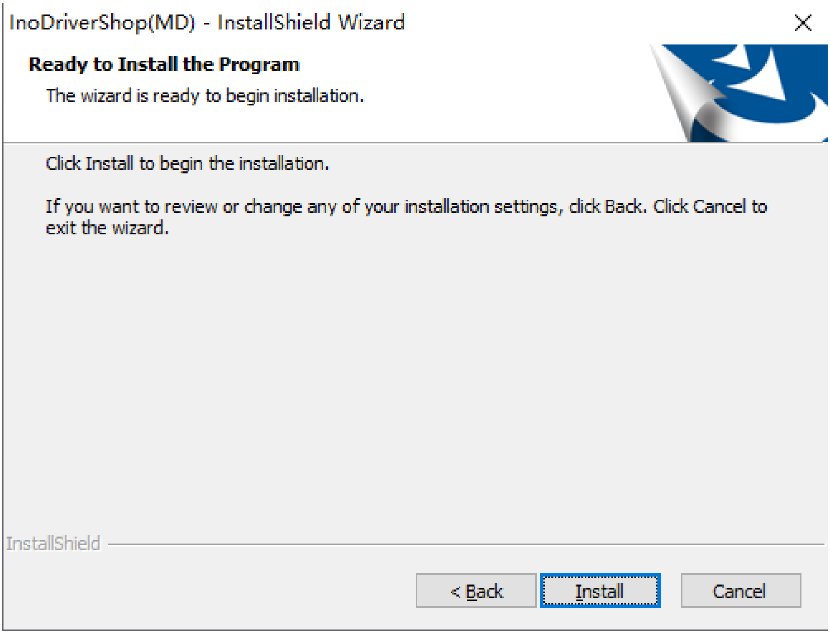


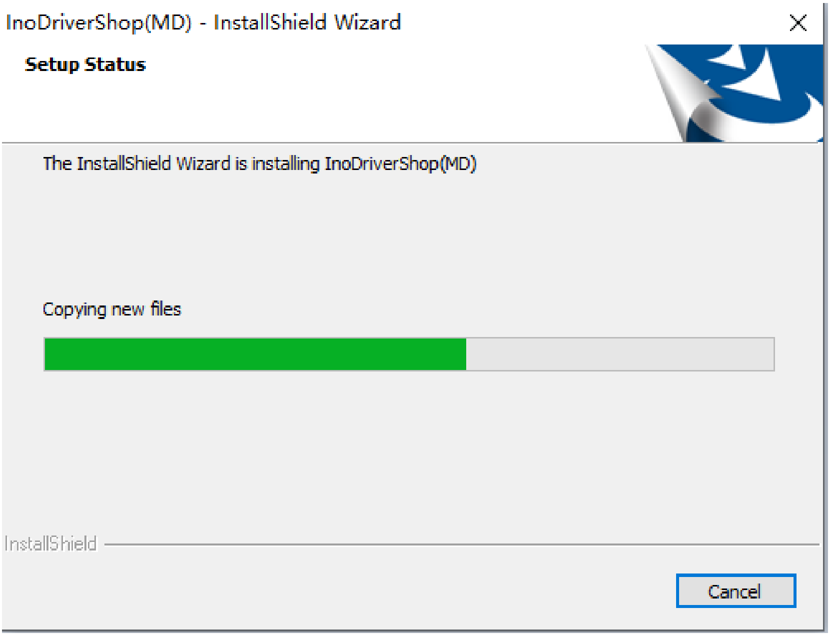
5. You can select the directory for installation as needed through the **Browse** button. The default directory for installation is "C:\Program Files\Inovance\InoDriverShop". In online upgrade, InoDriverShop will be upgraded directly in the original directory.

   After selecting the directory for installation, click **Next**.

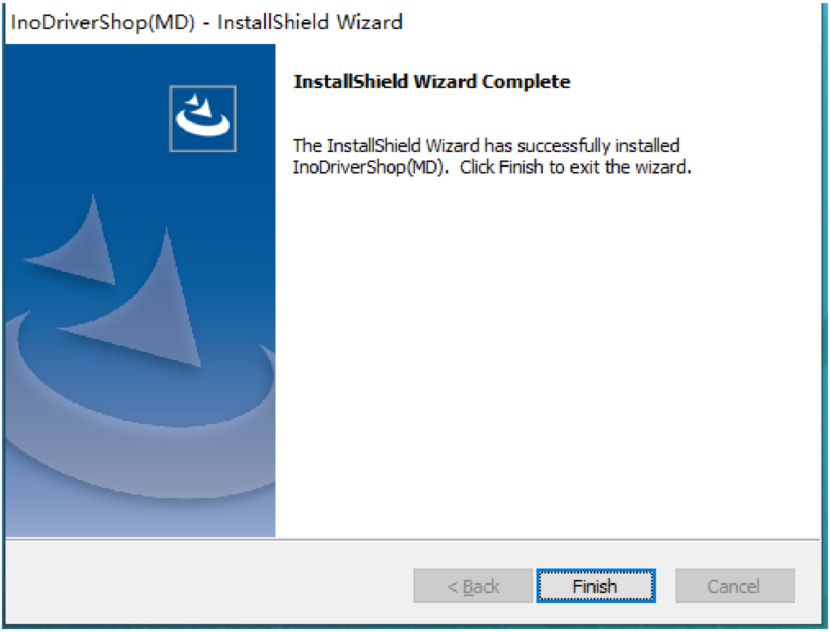


6. Click **Install** to start installation.





7. After installation is done, click **Finish**.



8. A shortcut icon for InoDriverShop will be generated automatically on the desktop.

1.2.2 Connecting the Software Tool

1. Start InoDriverShop.

- Double-click  to start InoDriverShop.
- If there is no shortcut for InoDriverShop on your desktop, click "Start" and search for "InoDriverShop".

2. Create a project.

a. Click ① shown in the following figure to create a project.

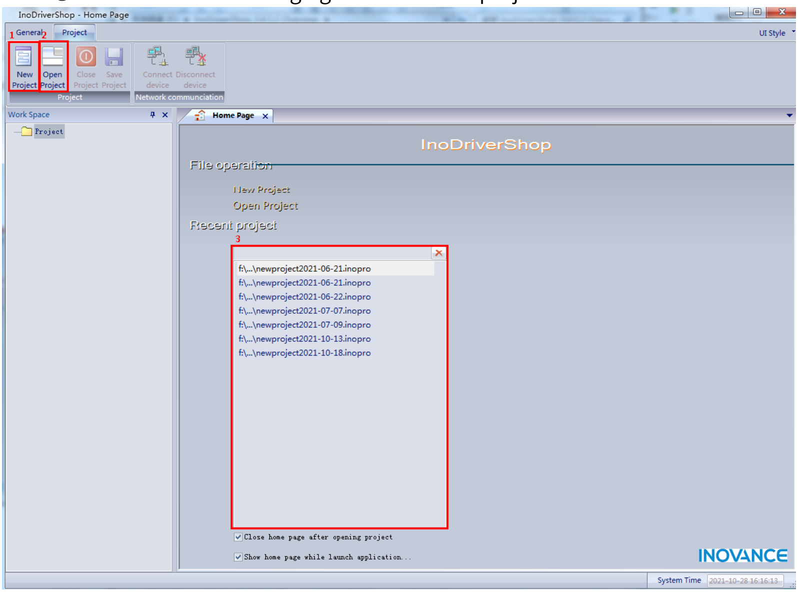


Figure 1-16 **Start interface**

Note

You can click 2 or 3 shown in the preceding figure to open the project saved before.

---

b. Open the **Project Guide** interface.

Click **Online** or **Offline** in area ①. Next, click the product series in area ②. Finally, load default communication parameters in area ③ based on the product series selected.

Figure 1-17 **Project Guide** interface

c. Click **Next page** to create a project.

- Creating a project for online device brings you to the following interface. The device is scanned automatically. Select the device to be commissioned and click **Finish**.

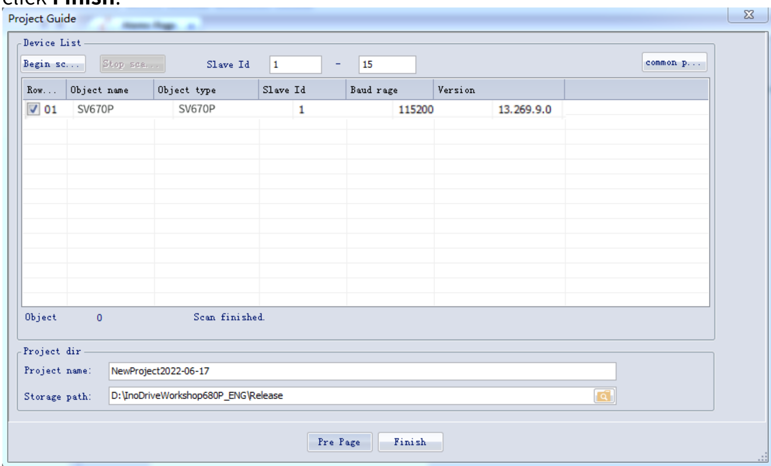


Figure 1-18 Scan interface

- Creating a project for offline device brings you to the following interface.

You can select the **Slave ID**, **Object Type**, and **Software Version** as needed and add different standards or customized devices. You can also designate the directory for storage or create multiple offline devices.

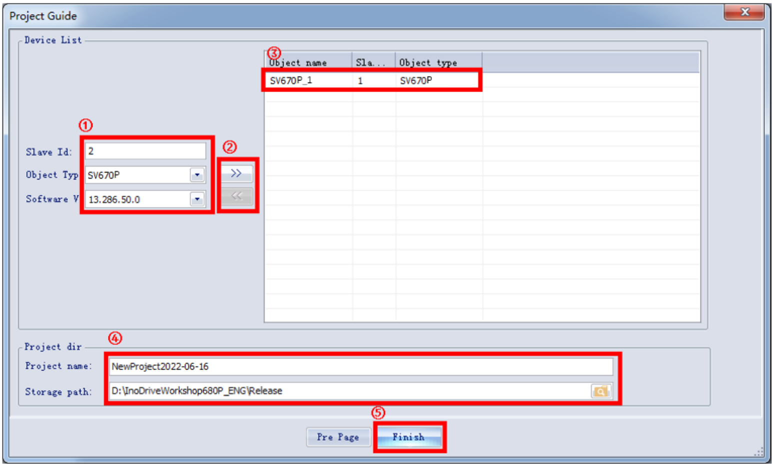


Figure 1-19 **Project Guide** interface for offline device

Note

① Station No., ④ Project name, and the storage directory can be changed as needed.

d. The project has been created.

3. The main interface is shown as follows.

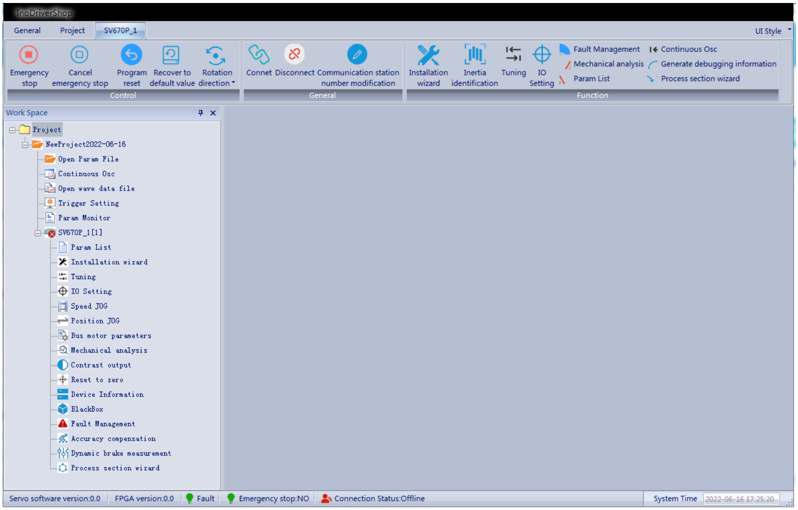
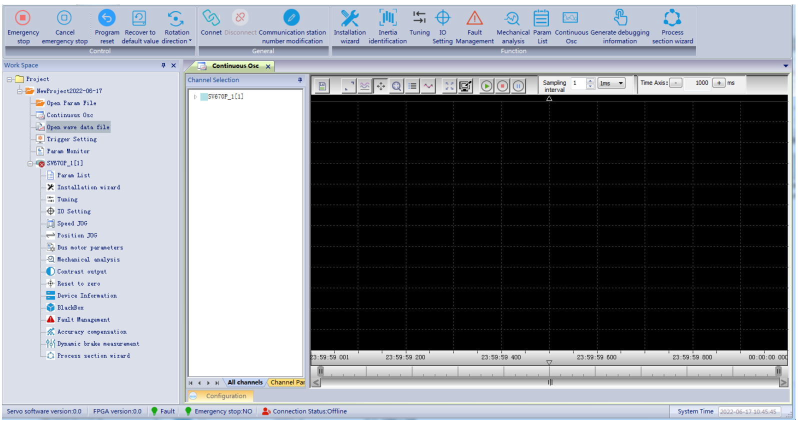


Figure 1-20 Main interface

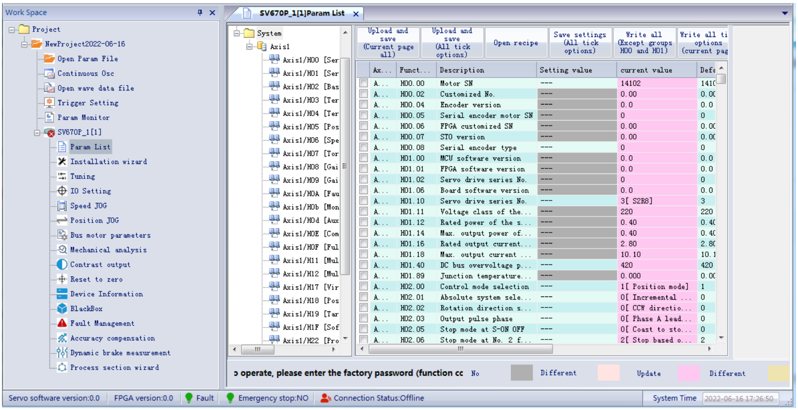
1.2.3 Introduction to the Software Tool

InoDriverShop features the following functions:

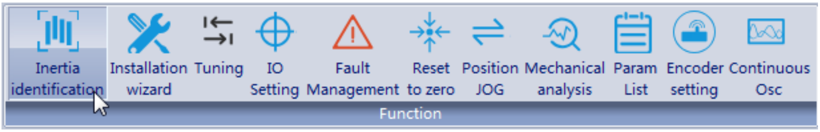
- Oscilloscope: Detects and saves the instantaneous data during operation.

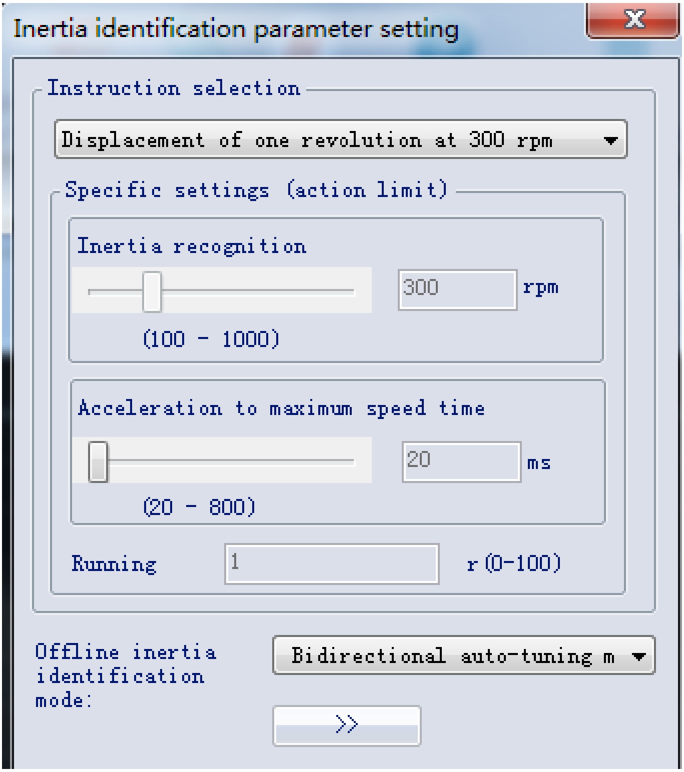


- Parameter management: Reads and downloads parameters in batches.

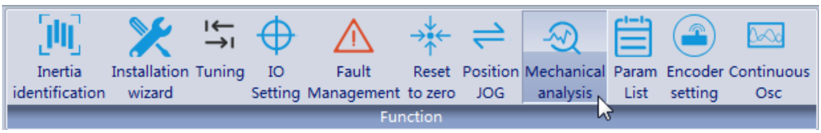


- Inertia auto-tuning: Generates the load inertia ratio automatically.

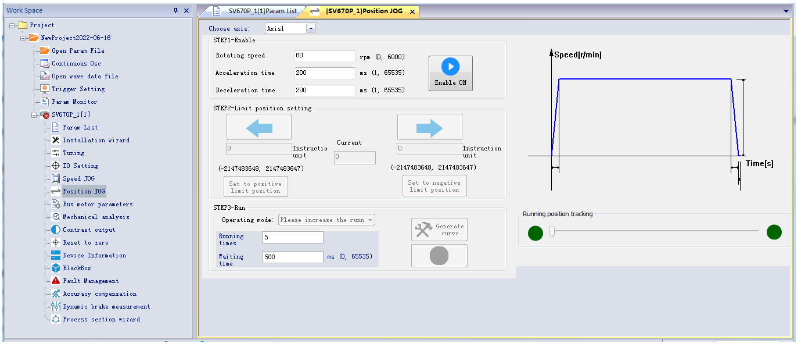




- Mechanical characteristic analysis: Analyzes the resonance frequency of the mechanical system.



- Motion JOG: Generates position references to make the motor reciprocate.



- Gain tuning: Adjusts the stiffness level and monitors the motion data.

2 Commissioning and Operation

2.1 Commissioning Flowchart

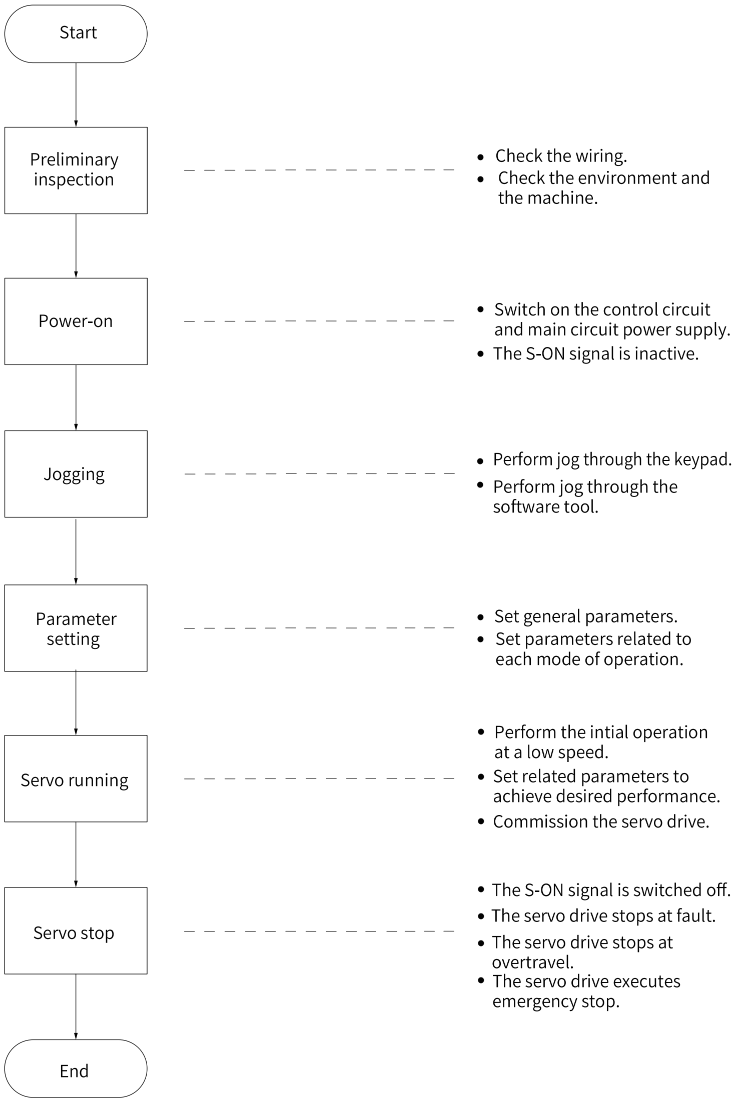


Figure 2-1 Commissioning flowchart of the drive

2.2 Commissioning Steps

2.2.1 Preliminary Check

Check the following items before operating the servo drive and the servo motor.

Table 2–1 Checklist before operation

Record	No.	Description
Wiring		
☐	1	The power input terminals (L1C, L2C, L1, L2, L3, R, S, T) of the servo drive are connected properly.
☐	2	The main circuit cables (U, V, W) of the motor are connected to the U/V/W terminals of the drive correctly.
☐	3	No short circuit exists in the power input terminals (L1, L2, L3, R, S, T) or main circuit output terminals (U, V, W) of the servo drive.
☐	4	The control signal cables, such as the brake signal cable and overtravel protection signal cable, are connected properly.
☐	5	The servo drive and servo motor are grounded properly.
☐	6	The stress suffered by the cable is within the specified range.
☐	7	All the wiring terminals are insulated properly.
Environment and Mechanical Conditions		
☐	1	No unwanted objects (such as cable terminals and metal chippings) that may cause short circuit are present inside or outside the servo drive.
☐	2	The servo drive and the external regenerative resistor are placed on incombustible objects.
☐	3	The servo motor is installed properly. The motor shaft is connected to the machine securely.
☐	4	The servo motor and the machine it is connected to are in good condition and ready to run.

2.2.2 Power-on

Switching on the input power supply

The power input terminals are L1C/L2C (control circuit power input terminals) and L1/L2/L3 or R/S/T (main circuit power input terminals).

After the power supply is switched on, if the bus voltage indicator is in the normal state and the keypad displays "reset"→"nrd.x"→"rdy" in sequence, the drive is ready to run and waits for the S-ON signal.

Note

- To connect the main circuit to a single-phase 220 VAC power supply, use any two of L1, L2, and L1, L2 and L3 terminals.
- If the keypad keeps displaying "nrd.x" or a fault code, rectify the fault according to Chapter "Troubleshooting".

2.2.3 Jog

Caution

To use the jog function, deactivate the S-ON signal first.

The jog function can be used in trial run to check whether the motor rotates properly, without abnormal vibration or noise generated during rotation. You can activate the jogging function through the keypad, two pre-configured external DIs, or the software tool. The motor takes the value saved in H06.04 as the jog speed.

Jogging through the keypad

- Commissioning Steps

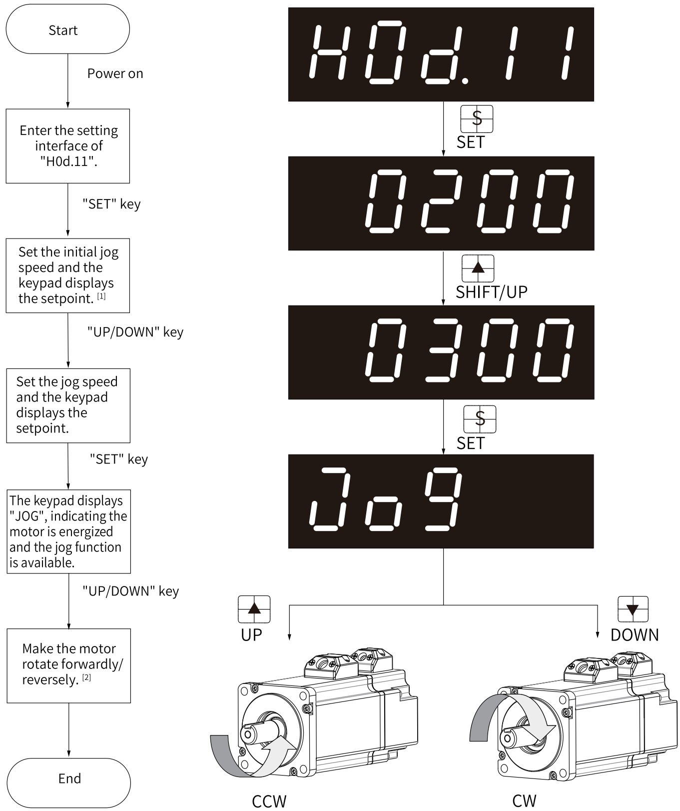


Figure 2-2 Procedure for setting the jog function

Note

- [1] Press the UP or DOWN key to increase or decrease the jog speed. After exiting from the jog mode, the initial speed applies.
- [2] Press the UP or DOWN key to make the motor rotate forwardly or reversely. After you release the key, the motor stops immediately.

- Procedure:

1. Enter the jog mode by setting H0d.11 through the keypad.

   The keypad displays the default jog speed at this moment.
2. Adjust the jog speed through the UP/DOWN key and press the SET key to enter the jog state.

   The keypad displays "JOG".

3. Press the UP/DOWN key to make the motor run forwardly or reversely.
4. Press the MODE key to exit the jog mode and return to the upper-level menu.

The setpoint of H06.04 returns to the default value.

☆ Related parameters:

See " H06.04" on page 193 for details.

- Exiting from jog
  Press the MODE key to exit the jog running and return to the upper-level menu.

Jog through the DI

Note

The jog function can be activated through the DI in any control mode.

Procedure:

1. Assign FunIN.18 and FunIN.19 to two external DIs.
2. Set H06.04.
3. Make the motor jog forwardly or reversely through changing the DI status.

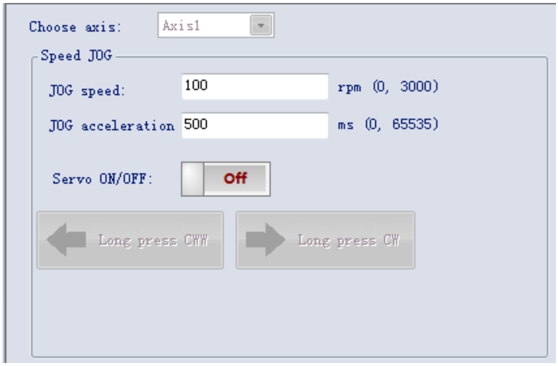
☆ Related function No.

No.	Name	Function Name	Description
FunIN.18	JOGCMD+	Forward jog	Active: Input based on command Invalid: Command input stopped
FunIN.19	JOGCMD–	Reverse jog	Active: Input in reverse to the command Invalid: Command input stopped

Jogging through the software tool

Enter the jog interface of the software tool first, and then set the jog speed through H06.04. After clicking the S-ON button, you can perform forward or reverse jog through the forward/reverse button.

When you close the jog interface to exit from the jog mode, H06.04 returns to the default value, with previous setpoint abandoned.



2.2.4 Setting Parameters

For general parameter settings, see **Setup wizard** in InoDriverShop.

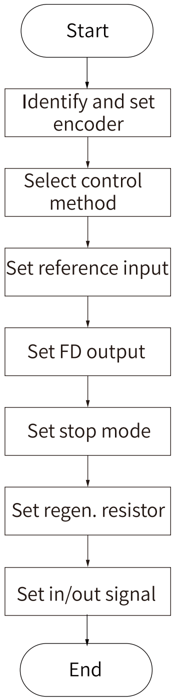


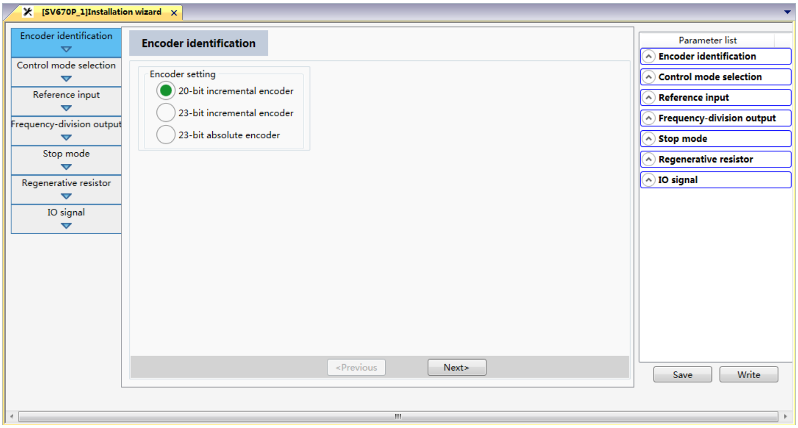
Figure 2-3 Setup wizard process

Note

Parameters set in **Installation wizard** will not be written to the drive. After all settings in **Installation wizard** are done, you can check the configured parameters in **Parameter List** and click **Write** to write parameters to the drive in batches.

1. **Identify and set the encoder.**

   After setting the encoder type in **Encoder identification** > **Encoder setting**, click **Next** to select the **Rotation direction**, and then click **Application**. The set parameters will be generated in **Parameter list** on the right.

   Set H02.02 to change the direction of rotation directly.

   ☆ Related parameters:

   See *" H02.02" on page 144* for details.

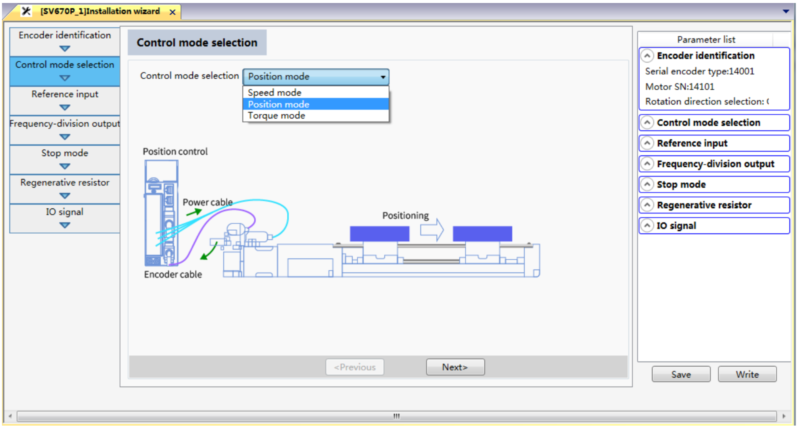
   The change of H02.02 does not affect the pulse output form or the sign (+/-) of monitoring parameter values.

   The direction of "forward drive" in overtravel prevention is the same as that defined by H02.02.

2. **Control mode selection**

   You can select **Speed mode**, **Position mode**, or **Torque mode** in the control mode selection interface. After selecting the control mode, click **Next** to set corresponding parameters. The sub-process that needs to be set vary with the control mode. The following takes position control as an example.

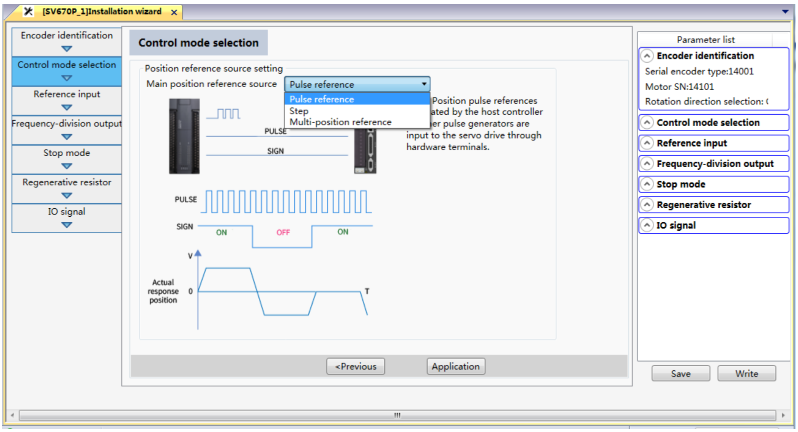
   a. Select "Position mode" from the drop-down list of "Control mode selection".



☆ Related parameters:

See " H02.00" on page 143 for details.

b. Select "Pulse reference" from the drop-down list of "Main position reference source".



☆ Related parameters:

See " H05.00" on page 172 for details.

c. After setting the sub-process of the control mode, click **Application** to enter the sub-process of **Reference input**.

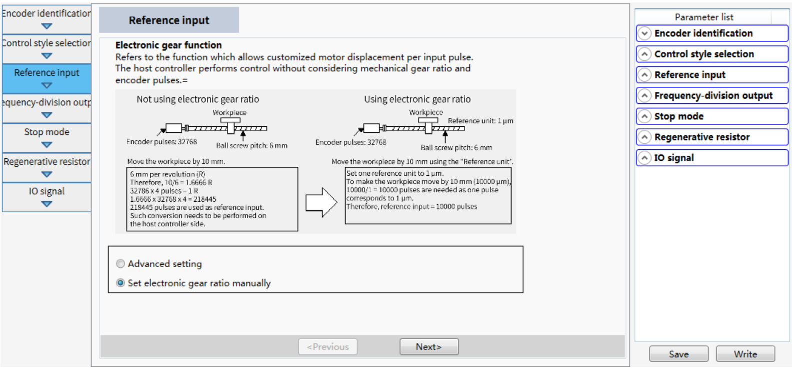
3. **Reference input setting**

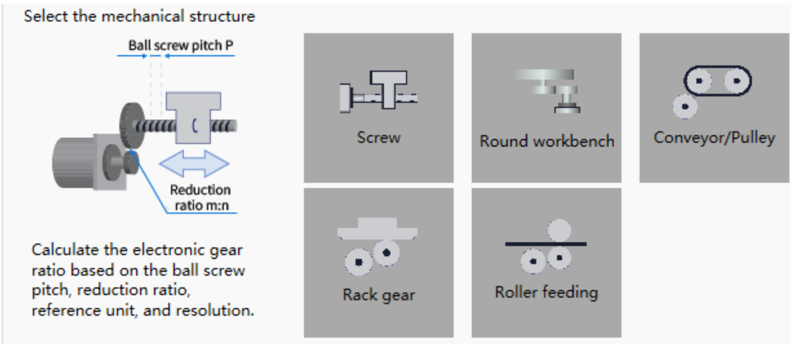
This sub-process is used to set the gear ratio, pulse access selection, reference form, and positioning completed threshold.

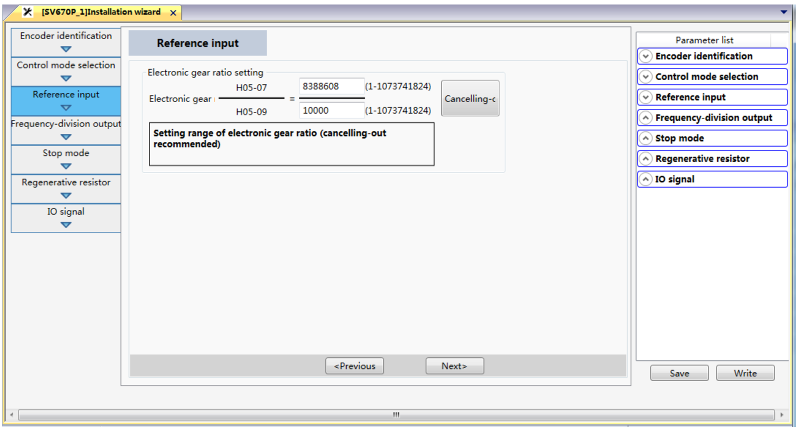
- The gear ratio can be set in two ways: **Adanvced setting** and **Set electronic gear ratio manually**.

Adanvced setting: You can infer the gear ratio based on different mechanical transmission mode. The mechanical transmission models shown in the following figures are supported.

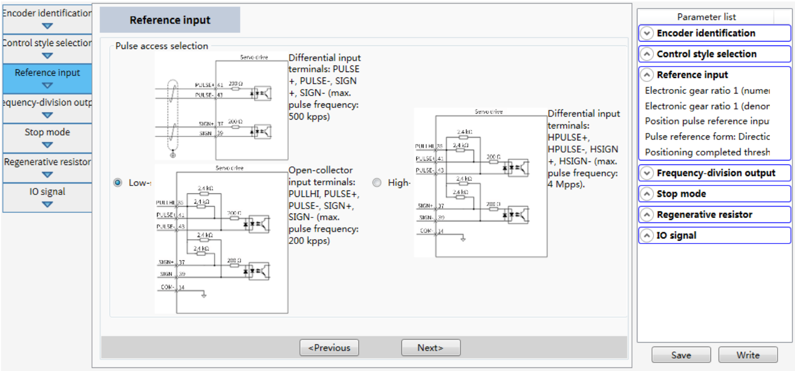
Set electronic gear ratio manually: You can input the gear ratio manually.



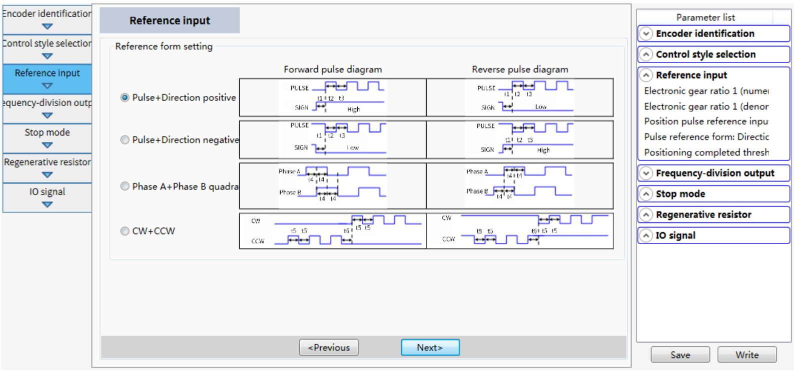




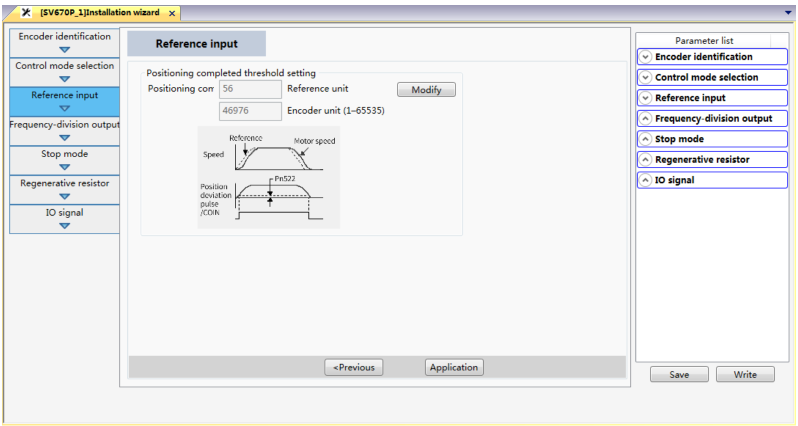
- Pulse access selection



- Reference form setting



- Positioning completed threshold setting



☆ Related parameters:

See " H05.02" on page 173 for details.

See " H05.07" on page 174 for details.

See " H05.09" on page 175 for details.

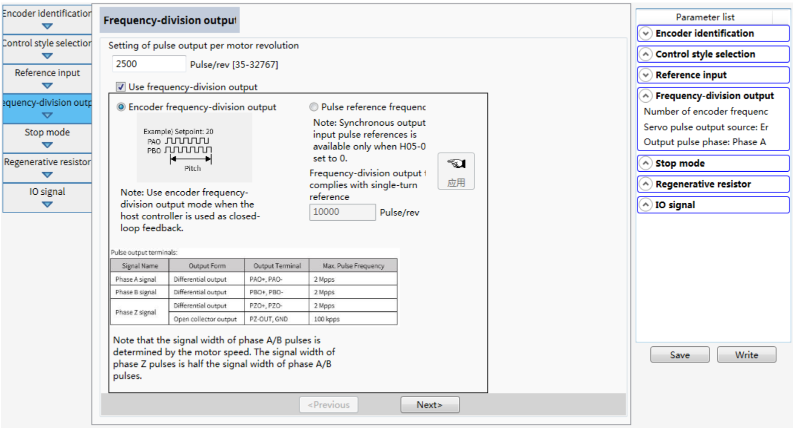
See " H05.11" on page 175 for details.

See " H05.13" on page 175 for details.

4. **Frequency-division output**

This sub-process is mainly used to set the encoder frequency-division output, pulse output source, and pulse output feedback direction.

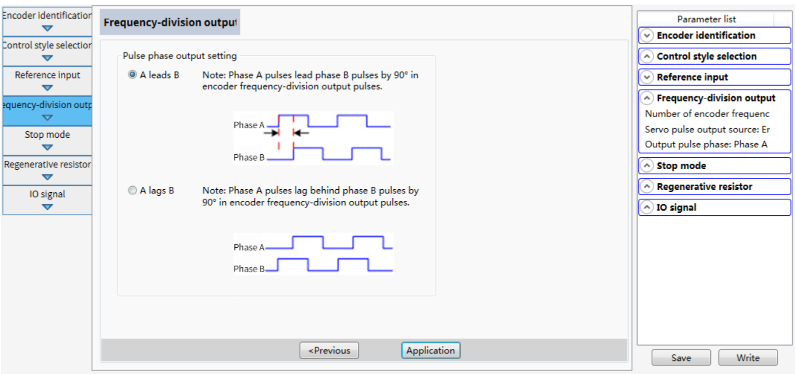
- Encoder frequency-division output



☆ Related parameters:

See " H05.17" on page 177 for details.

- Pulse output source



☆ Related parameters:

See *" H02.03" on page 145* for details.

The change of H02.02 does not affect the pulse output form or the sign (+/-) of monitoring parameter values.

The direction of "forward drive" in overtravel prevention is the same as that defined by H02.02.

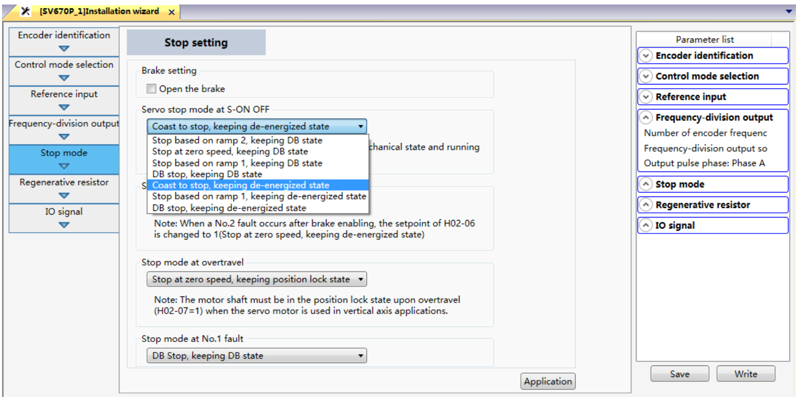
The output pulse of the servo drive is phase A + phase B quadrature pulse. The relationship between phase A and phase B pulses can be changed directly through H02.03.

5. **Stop mode**

The stop modes include "Brake setting", "Servo stop mode at S-ON OFF", "Stop mode at No.2 fault", "Stop mode at overtravel", and "Stop mode at No.1 fault".

a. Select whether to use the brake in **Brake setting**.

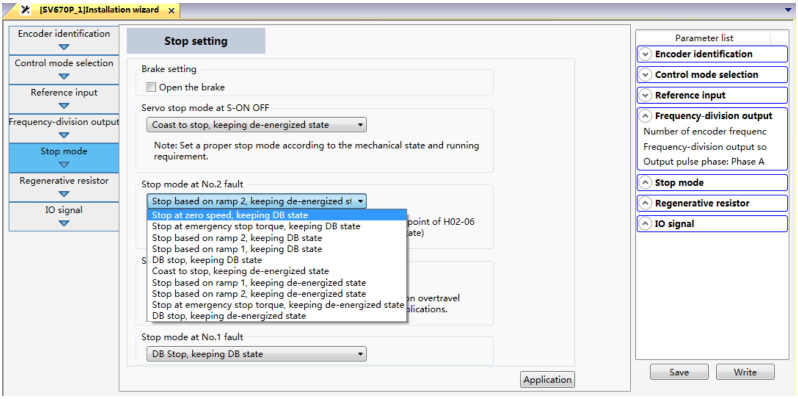
b. Select the stop mode for stop at S-ON OFF.



☆ Related parameters:

See *" H02.05" on page 146* for details.

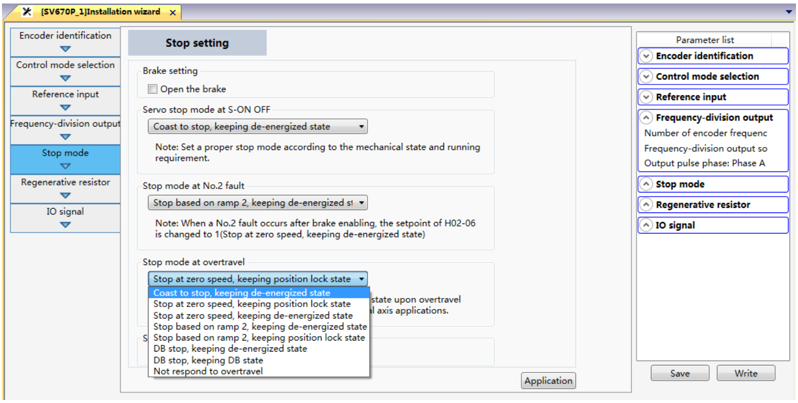
c. Select the stop mode at No.2 fault.



☆ Related parameters:

See " H02.06" on page 146 for details.

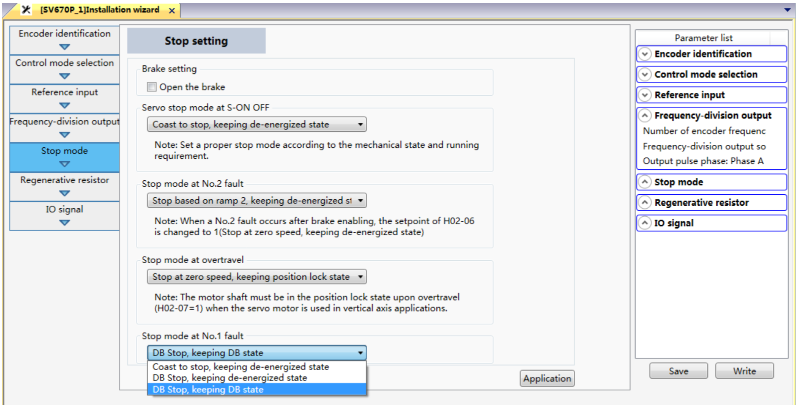
d. Select the stop mode at overtravel.



☆ Related parameters:

See " H02.07" on page 146 for details.

e. Select the stop mode at No.1 fault.



☆ Related parameters:

See " H02.08" on page 147 for details.

6. **Brake setting**

The brake is used to prevent the motor shaft from moving and lock the position of the motor and the motion part when the drive is in the non-operational status.

Caution

- Use the built-in brake for position-lock purpose only. Do not use this brake for any other purposes (such as braking) other than position lock in the stop state.
- The brake coil has no polarity.
- After the motor stops, switch off the S-ON signal.
- When the motor with brake runs, the brake may generate a click sound, which does not affect its function.
- If instruments such as a magnetic sensor is operating near the motor, flux leakage may occur on the motor shaft end when brake coils are energized (brake released).

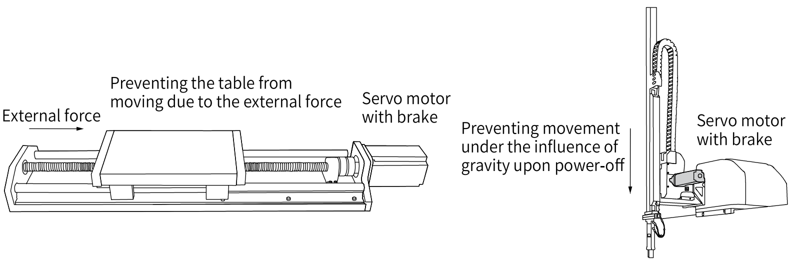


Figure 2-4 Application of the brake

Table 2–2 Brake specifications

Motor Model	Holding Torque (N·m)	Supply Voltage (VDC) ±10%	Coil Resistance (Ω)±7%	Exciting Current (A)	Release Time (ms)	Apply Time (ms)	Backlash (°)
MS1H1-05B/10B	0.32		94.4	0.25	≤ 20	≤ 40	≤ 1.5
MS1H1-20B/40B MS1H4-40B	1.5		75.79	0.32	≤ 20	≤ 60	≤ 1.5
MS1H1-75B/ MS1H4-75B	3.2		57.6	0.42	≤ 40	≤ 60	≤ 1
MS1H2-10C/15C/ 20C/25C	8	24	25	0.96	≤ 30	≤ 85	≤ 0.5
MS1H2-30C/40C/ 50C	16		21.3	1.13	≤ 60	≤ 100	≤ 0.5
MS1H3-85B/13C/ 18C	12		29.7	0.81	≤ 60	≤ 120	≤ 0.5
MS1H3-29C/44C/ 55C/75C	50		14.4	1.67	≤ 100	≤ 200	≤ 0.5

- Brake software setting
  The operating sequences of the brake are different in the normal state and fault state.

- Brake sequence in normal state
  The brake sequence in the normal state is further divided into the following two types:
  - Static: The motor speed is lower than 20 RPM.
  - Rotating: The motor speed is equal to or higher than 20 RPM.

- Brake sequence for motor at standstill
  If the servo enabling (S-ON) signal changes from ON to OFF, and the present motor speed is lower than 20 RPM, the servo drive acts according to the brake time sequence in the static state of the motor.

Caution

- After the brake output signal changes from "OFF" to "ON", do not input a position/speed/torque reference within the time defined by H02.09. Otherwise, reference loss or an operation error may occur.
- When the motor is used to drive a vertical axis, the motion part may move slightly under the influence of gravity or external force. If the S-ON signal is switched off, the brake output is set to "OFF" immediately when the motor is at standstill. However, within the time defined by H02.10, the motor is still energized, preventing the load from moving under the influence of gravity or external force.

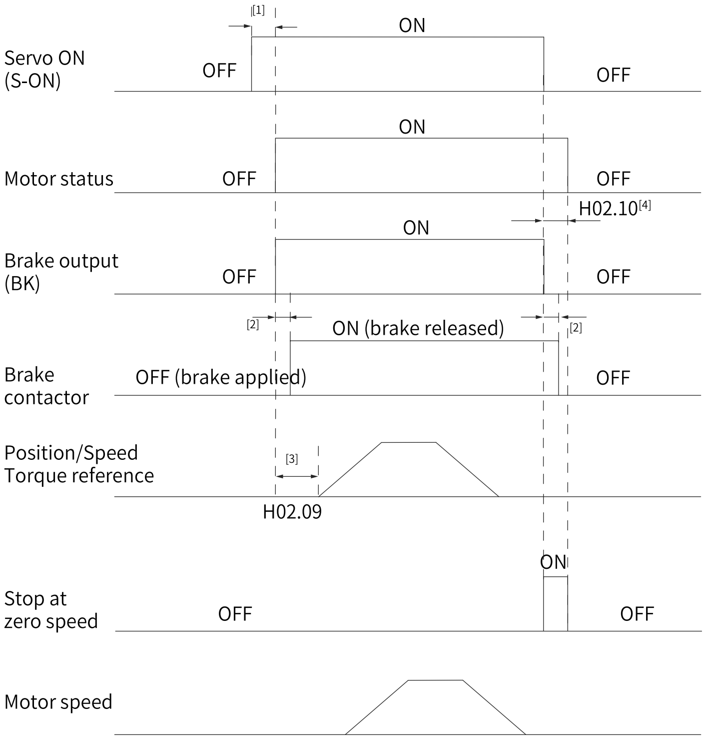


Figure 2-5 Brake sequence for motor at standstill

Note

- [1] When the S-ON signal is switched on, the brake output is set to "ON" at a delay of about 80 ms, with motor being energized at the same time.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [3] The interval time, which starts from the moment when brake output is set to "ON" to the moment when a command is input, must be higher than the setpoint of H02.09.
- [4] When the S-ON signal is switched off with motor at standstill (motor speed lower than 20 rpm), the brake output is set to "OFF". You can set in H02.10 the delay of the motor in entering the de-energized state after the brake output is set to "OFF".

☆ Related parameters:

See *" H02.09" on page 147* for details.

See *" H02.10" on page 148* for details.

- Brake sequence for motor in the rotation state
  If the S-ON signal changes from ON to OFF, and the present motor speed is equal to or higher than 20 RPM, the servo drive acts according to the brake time sequence in motor rotating state.

Caution

- When the S-ON signal is switched on, do not input a position/speed/torque reference within the time defined by H02.09. Otherwise, reference loss or an operation error may occur.
- If the S-ON signal is switched off when the motor is still rotating, the motor enters the "Stop at zero speed" state, but the brake output can be set to "OFF" only when one of the following conditions is met:
  - The motor has decelerated to the value defined by H02.11, but the time defined by H02.12 is not reached.
  - The time defined by H02.12 has been reached, but the motor speed is still higher than the value defined by H02.11.
- The motor is still energized within 50 ms after the brake output changes from "ON" to "OFF". This is to prevent the motion parts from moving under the influence of gravity or external force.

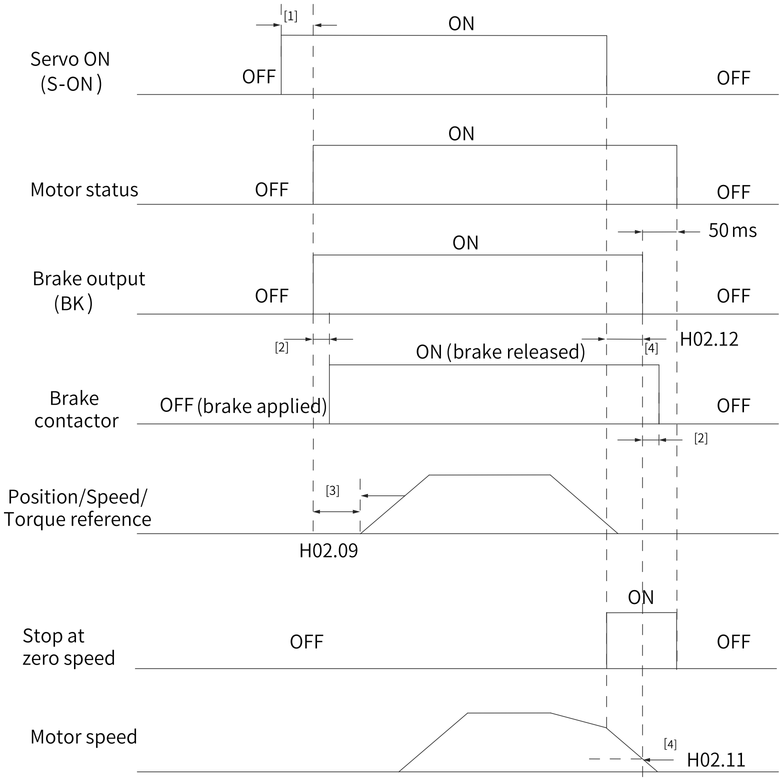


Figure 2-6 Brake sequence for a rotating motor

Note

- [1] When the S-ON signal is switched on, the brake output is set to "ON" at a delay of about 80 ms, with motor being energized at the same time.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [3] The interval time, which starts from the moment when brake output is set to "ON" to the moment when a command is input, must be higher than the setpoint of H02.09.
- [4] When the S-ON signal is switched off during rotation of the motor, the motor enters the de-energized state only after the delay defined by H02.12 elapses or the speed feedback is lower than H02.11 after the brake output is off.

☆ Related parameters:

See *" H02.11" on page 148* for details.

See *" H02.12" on page 148* for details.

- Brake sequence in the fault state
  Based on stop mode, servo faults are classified into class 1 (No.1) faults and class 2 (No.2) faults. For details, see SV670P Series Servo Drive Troubleshooting Guide. The brake sequences in the fault state are further divided into the following two types:
  - In case of No. 1 faults:
    The condition for brake output is the same as the brake sequence for the motor in the rotation state. Which is to say: the brake output signal becomes OFF only when one of the following conditions is met:
    - The motor has decelerated to the value defined by H02.11, but the time defined by H02.12 is not reached.
    - The time defined by H02.12 has been reached, but the motor speed is still higher than the value defined by H02.11.
  - In case of No. 2 faults:
    When a No. 2 fault occurs and the brake is enabled, the stop mode is forced to "Stop at zero speed, keeping dynamic braking status".

    In this case, the servo motor stops at zero speed first. When the actual motor speed is lower than 20 RPM, the brake output signal immediately becomes OFF, but the motor is still in the energized state within the time defined by H02.10.

7. **Regenerative resistor setting**
   When the motor torque direction is opposite to the direction of rotation, the energy is fed back to the servo drive from the motor side, leading to bus voltage rise. Once the bus voltage rises to the braking threshold, the excessive energy must be consumed by a regenerative resistor. Otherwise, the servo drive will be damaged. The regenerative resistor can be a built-in or an external one. However, a built-in regenerative resistor cannot be used together with an external one. Specifications of the regenerative resistor are as follows.

Table 2–3 Specifications of the regenerative resistor

<table>
<tr><th rowspan="2">Servo Drive Model</th><th colspan="3">Specifications of Built-in Regenerative Resistor</th><th rowspan="2">Min. Permissible Resistance of External Regenerative Resistor (Ω) (H02.21)</th></tr>
<tr><th>Resistance (Ω)</th><th>Power (Pr) (W)</th><th>Processing Power (Pa) (W)</th></tr>
<tr><td>SV670PS1R6I</td><td>-</td><td>-</td><td>-</td><td rowspan="3">40</td></tr>
<tr><td>SV670PS2R8I</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>SV670PS5R5I</td><td>50</td><td>50</td><td>40</td></tr>
<tr><td>SV670PS7R6I</td><td rowspan="2">25</td><td rowspan="2">80</td><td rowspan="2">64</td><td>20</td></tr>
<tr><td>SV670PS012I</td><td>15</td></tr>
</table>

<table>
<tr><th rowspan="2">Servo Drive Model</th><th colspan="3">Specifications of Built-in Regenerative Resistor</th><th rowspan="2">Min. Permissible Resistance of External Regenerative Resistor (Ω) (H02.21)</th></tr>
<tr><th>Resistance (Ω)</th><th>Power (Pr) (W)</th><th>Processing Power (Pa) (W)</th></tr>
<tr><td>SV670PS018I</td><td rowspan="3">20</td><td rowspan="3">100</td><td rowspan="3">80</td><td rowspan="3">20</td></tr>
<tr><td>SV670PS022I</td></tr>
<tr><td>SV670PS027I</td></tr>
<tr><td>SV670PT3R5I</td><td rowspan="2">100</td><td rowspan="4">80</td><td rowspan="4">64</td><td>80</td></tr>
<tr><td>SV670PT5R4I</td><td>60</td></tr>
<tr><td>SV670PT8R4I</td><td rowspan="2">50</td><td>45</td></tr>
<tr><td>SV670PT012I</td><td>40</td></tr>
<tr><td>SV670PT017I</td><td rowspan="3">35</td><td rowspan="3">100</td><td rowspan="3">80</td><td>35</td></tr>
<tr><td>SV670PT021I</td><td rowspan="2">25</td></tr>
<tr><td>SV670PT026I</td></tr>
</table>

Note

- The built-in regenerative resistor is not available in standard S1R6 or S2R8 models. You can install an external regenerative resistor as needed or contact Inovance to order customized S1R6 and S2R8 models that carry the built-in regenerative resistor.
- The processing power (P_a) of the built-in regenerative resistor is affected by the ambient temperature and actual load rate of the drive.

- Without external load torque

  The kinetic energy generated upon braking of a reciprocating motor is converted into electric energy that fed back to the bus capacitor. When the bus voltage rises above the braking voltage threshold, the regenerative resistor starts consuming the excessive energy fed back by the motor. The following figure shows the motor speed curve in no-load operation from 3000 RPM to a standstill.

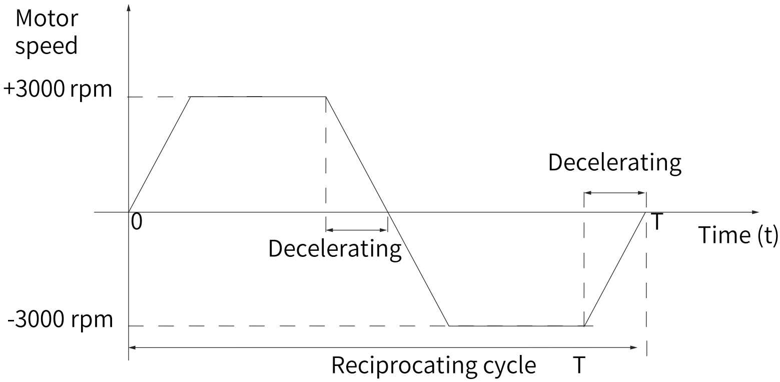


Figure 2-7 Example of motor speed curve (without external load torque)

- Energy calculation
  The built-in braking resistor is not available in SV670PS1R6I and SV670PS2R8I models. The energy that can be absorbed by a capacitor is described in section "Design of Peripherals" in SV670P Series Servo Drive Hardware Guide. An external regenerative resistor is needed when the rotational energy of the motor and the load exceeds the values listed in the following table.

Servo Drive Model	Regenerative Energy That Can Be Absorbed (W)	Remarks
SV670PS1R6I	13.15	The input voltage of the main circuit power supply is 220 VAC.
SV670PS2R8I	26.29	

  - The following table shows the energy generated by a 220 V motor in decelerating from the rated speed to a standstill during no-load operation.

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (10^{-4} kgm ^{2})	Braking Energy E_O Generated During Decelerating from Rated Speed to a Standstill (J)	Max. Braking Energy Absorbed by Capacitor E_C (J)
0.05	MS1H1-05B30CB-*330Z	0.026	0.13	7.8
	MS1H1-05B30CB-*332Z	0.028	0.14	
0.1	MS1H1-10B30CB-*330Z	0.041	0.20	
	MS1H1-10B30CB-*332Z	0.043	0.21	
0.2	MS1H1-20B30CB-*331Z	0.207	1.02	
	MS1H1-20B30CB-*334Z	0.220	1.09	
0.4	MS1H1-40B30CB-*331Z	0.376	1.86	15.7
	MS1H1-40B30CB-*334Z	0.390	1.93	
0.55	MS1H1-55B30CB-*331Z	1.06	5.24	22.4
0.75	MS1H1-75B30CB-*331Z	1.38	6.82	22.4
	MS1H1-75B30CB-*334Z	1.430	7.07	
1	MS1H1-10C30CB-*331Z	1.75	8.65	32.4

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (10^{-4} kgm ^{2})	Braking Energy E_O Generated During Decelerating from Rated Speed to a Standstill (J)	Max. Braking Energy Absorbed by Capacitor E_C (J)
1	MS1H2-10C30CB-*331Z	1.87	9.2	26.7
	MS1H2-10C30CB-*334Z	3.12		
1.5	MS1H2-15C30CB-*331Z	2.46	12.2	26.7
	MS1H2-15C30CB-*334Z	3.71		47.7
0.85	MS1H3-85B15CB-*331Z	13.3	16.45	22.4
	MS1H3-85B15CB-*334Z	14	17.3	
1.3	MS1H3-13C15CB-*331Z	17.8	22	22.4
	MS1H3-13C15CB-*334Z	18.5	22.86	
0.1	MS1H4-10B30CB-*330Z	0.102	0.50	7.8
	MS1H4-10B30CB-*332Z	0.104	0.51	
0.4	MS1H4-40B30CB-*331Z	0.657	3.25	15.7
	MS1H4-40B30CB-*334Z	0.667	3.30	
0.75	MS1H4-75B30CB-*331Z	2	9.92	22.4
	MS1H4-75B30CB-*334Z	2.012	9.92	

- The following table shows the energy generated by a 380 V motor in decelerating from the rated speed to a standstill during no-load operation.

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (10^{-4} kgm ^{2})	Braking Energy E_O Generated During Decelerating from Rated Speed to a Standstill (J)	Max. Braking Energy Absorbed by Capacitor E_C (J)
1	MS1H2-10C30CD-*331Z	1.87	9.2	34.3
	MS1H2-10C30CD-*334Z			
1.5	MS1H2-15C30CD-*331Z	2.46	12.2	34.3
	MS1H2-15C30CD-*334Z			
2	MS1H2-20C30CD-*331Z	3.06	15.1	50.4
2.5	MS1H2-25C30CD-*331Z	3.65	18	50.4
3	MS1H2-30C30CD-*331Z	7.72	38.2	50.4
4	MS1H2-40C30CD-*331Z	12.1	59.8	82.7
5	MS1H2-50C30CD-*331Z	15.4	76.2	82.7
0.85	MS1H3-85B15CD-*331Z	13.3	16.45	28.2
	MS1H3-85B15CD-*334Z	14	17.3	34.3
1.3	MS1H3-13C15CD-*331Z	17.8	22	34.3
	MS1H3-13C15CD-*334Z	18.5	22.88	34.3
1.8	MS1H3-18C15CD-*331Z	25	30.9	50.4
	MS1H3-18C15CD-*334Z	25.7	31.78	50.4
2.9	MS1H3-29C15CD-*331Z	55	68	50.4
	MS1H3-29C15CD-*334Z	55	68	50.4
4.4	MS1H3-44C15CD-*331Z	88.9	109.9	82.7
	MS1H3-44C15CD-*334Z	88.9	109.9	82.7
5.5	MS1H3-55C15CD-*331Z	107	132.28	100.8
	MS1H3-55C15CD-*334Z	107	132.28	100.8

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (10^{-4} kgm ^{2})	Braking Energy E O Generated During Decelerating from Rated Speed to a Standstill (J)	Max. Braking Energy Absorbed by Capacitor E C (J)
7.5	MS1H3-75C15CD-*331Z	141	174.33	100.8
	MS1H3-75C15CD-*334Z	141	174.33	100.8

If the total braking time T is known, you can determine whether an external regenerative resistor is needed and the power required using the following flowchart and formula.

- Regenerative resistor selection

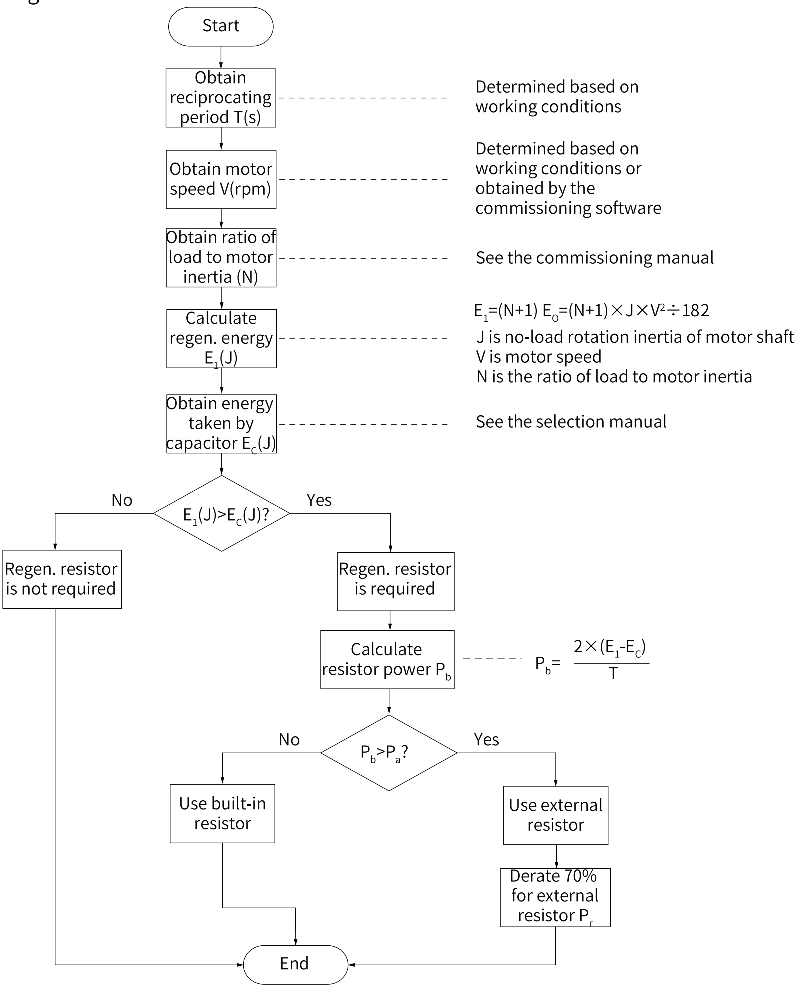


Figure 2-8 Flowchart for selecting the regenerative resistor

Note

- Take the process in which the motor decelerates from 3000 RPM to 0 RPM as an example. Assume that the load inertia is (N x Motor inertia), then the braking energy is (N + 1) x E_O when the motor decelerates from 3000 RPM to 0 RPM. The energy consumed by the braking resistor is (N + 1) x E_O - E_C (E_C represents the energy absorbed by the capacitor). Suppose the reciprocating cycle is T, then the power of the regenerative resistor needed is 2 x [(N + 1) x E_O - E_C]/T. For values of E_O and E_C, see Braking Energy in SV670P Series Servo Drive Commissioning Guide.
- Determine whether to use the regenerative resistor according to the preceding figure and select a built-in or an external regenerative resistor as needed. Then, set H02.25 accordingly.
- The resistor with aluminum case is recommended.

Take the H1 series 750 W model as an example. Assume that the reciprocating cycle (T) is 2s, the maximum speed is 3000 RPM, and the load inertia is (4 x Motor inertia), then the required power of the braking resistor is as follows:

$$P_b = \frac{2\times[(N+1)\times E_O - E_C]}{T} = \frac{2\times[(4+1)\times 6.8-22.4]}{2} = 11.6W$$

The calculated result is smaller than the processing capacity (P_a is 40 W) of the built-in braking resistor, so a built-in braking resistor is enough.

If the inertia ratio in the preceding example is changed to 10 x motor inertia, and other conditions remain the same, the power of the regenerative resistor required will be as follows:

$$P_b = \frac{2\times[(N+1)\times E_O - E_C]}{T} = \frac{2\times[(10+1)\times 6.8-22.4]}{2} = 52.4W$$

The calculation result is larger than the processing capacity (P_a is 40 W) of the built-in braking resistor, so an external braking resistor is required. The recommended power of the external braking resistor is P_b/(1 - 70%) = 174.67 W.

☆ Related parameters:

See *" H02.21" on page 149* for details.

See *" H02.24" on page 151* for details.

See *" H02.25" on page 152* for details.

See *" H02.26" on page 152* for details.

See *" H02.27" on page 152* for details.

- Using an external regenerative resistor

When P_b is greater than P_a, use an external braking resistor. Set H02.25 to 1 or 2 based on the cooling mode of the braking resistor.

Use the external braking resistor with 70% derated, that is, P_r equals to P_b/(1 - 70%), and ensure the resistance of the braking resistor is higher than the minimum allowed resistance allowed by the servo drive. Remove the jumper bar between terminals P⊕ and D, and connect the external regenerative resistor between terminals P⊕ and C.

For the wiring diagram of the external braking resistor and the specifications of the jumper, see section "Design of Peripherals" in SV670P Series Servo Drive Hardware Guide. Set H02.25 to 1 or 2 based on the cooling mode of the braking resistor.

☆ Related parameters:

See *" H02.21" on page 149* for details.

See *" H02.26" on page 152* for details.

See *" H02.27" on page 152* for details.

Caution

- Set the power (H02.26) and resistance (H02.27) of the external regenerative resistor.
- Ensure the resistance of the external regenerative resistor is higher than or equal to the permissible minimum resistance.
- When the regenerative resistor is used at its rated power rather than the processing power (average value) in environments within the specified temperature range, the temperature of the resistor will rise to above 120°C under continuous braking. To ensure safety, cool the resistor down through forced air cooling, or use the resistor with thermal switch. For the load characteristics of the regenerative resistor, consult with the manufacturer.

Set the heat dissipation coefficient based on the heat dissipation condition of the external regenerative resistor.

☆ Related parameters:

See *" H02.24" on page 151* for details.

Note

Higher resistor heat dissipation coefficient indicates higher braking efficiency.

- Using the built-in regenerative resistor
  When P_b is smaller than P_a and E_1 is greater than E_C, use the built-in braking resistor. In this case, set H02.25 to 0.

  When using the built-in regenerative resistor, connect terminals P⊕ and D with a jumper bar.

- Regenerative resistor not needed
  When E_1 is smaller than E_C, no braking resistor is required because the braking energy can be absorbed by the bus capacitor. In this case, set H02.25 to 3.

- External load torque applied, motor in generating state
  When the motor direction of rotation is the same with the shaft direction of rotation, the motor outputs energy to the outside. In some applications where the motor direction of rotation is opposite to the shaft direction of rotation, the motor is in the generating state and feeds the electric energy back to the servo drive.

  When the load is in the generating state continuously, it is recommended to adopt the common DC bus mode.

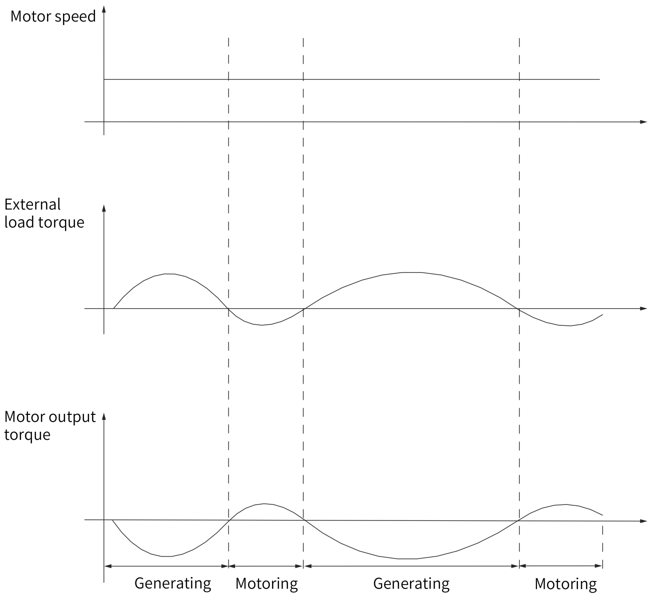


Figure 2-9 Example of the curve with external load torque

Take H1 series 750 W models (rated torque: 2.39 N·m) as an example. When the external load torque is 60% of the rated torque and the motor speed reaches 1500 RPM, the power fed back to the drive is (60% x 2.39) x (1500 x 2π/60) = 225

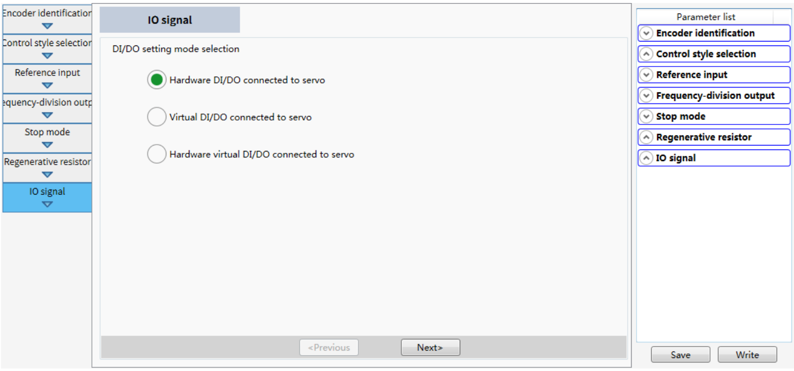
W. As the braking resistor needs to be derated by 70%, the power of the external braking resistor is 225/(1 - 70%) = 750 W, with resistance being 50 Ω.

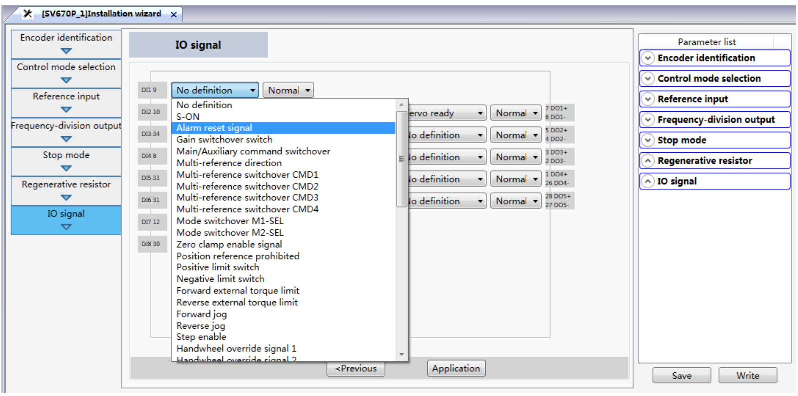
8. **Input/Output signal setting**

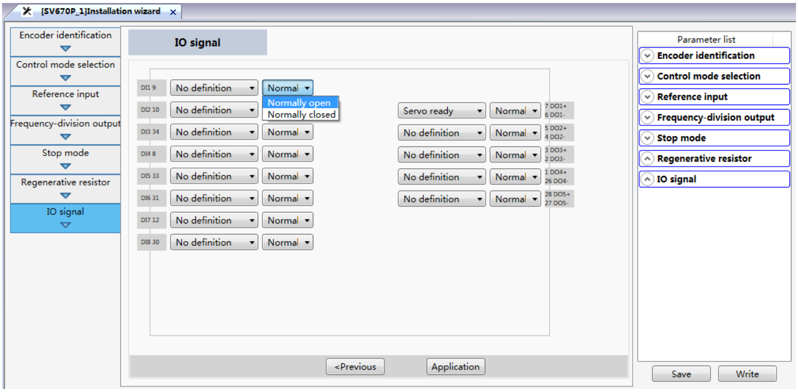
The I/O signal setting is the same as "DI/DO setting mode selection".

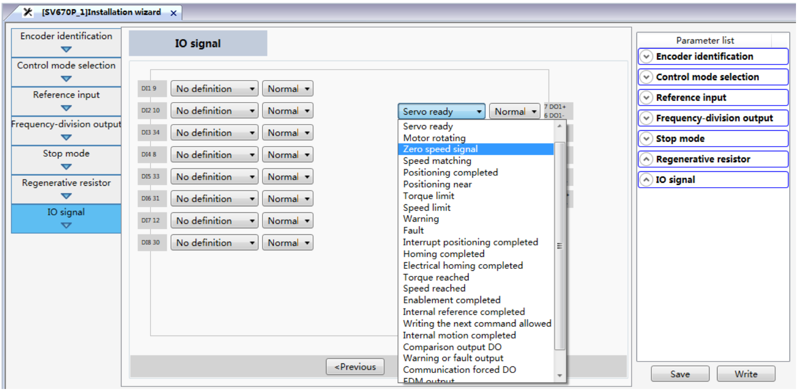
The DI/DO setting modes include "Hardware DI/DO connected to servo", "Virtual DI/DO connected to servo", and "Hardware virtual DI/DO connected to servo".

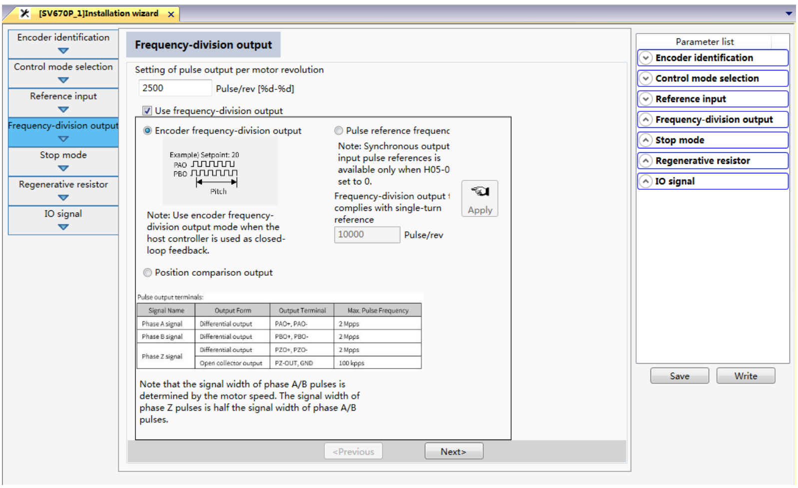
The corresponding default function will be generated based on different control modes selected in "控制方式选择", or you can define the function as needed.






[SV670P_1]Installation wizard
Encoder identification
Control mode selection
Reference input
Frequency-division output
Stop mode
Regenerative resistor
IO signal
IO signal
DI1 9
DI2 10
DI3 34
DI4 8
DI5 33
DI6 31
DI7 12
DI8 30
No definition
Normal
Normally open
Normally closed
Servo ready
7 DO1+
6 DO1-
5 DO2+
4 DO2-
3 DO3+
2 DO3-
1 DO4+
26 DO4-
28 DO5+
27 DO5-
<Previous
Application
Parameter list
Save
Write


[SV670P_1]Installation wizard
IO signal
Servo ready
Motor rotating
Zero speed signal
Speed matching
Positioning completed
Positioning near
Torque limit
Speed limit
Warning
Fault
Interrupt positioning completed
Homing completed
Electrical homing completed
Torque reached
Speed reached
Enablement completed
Internal reference completed
Writing the next command allowed
Internal motion completed
Comparison output DO
Warning or fault output
Communication forced DO
<Previous
Parameter list
Save
Write


[SV670P_1]Installation wizard
Encoder identification
Control mode selection
Reference input
Frequency-division output
Stop mode
Regenerative resistor
IO signal
Frequency-division output
Setting of pulse output per motor revolution
2500
Pulse/rev [%d-%d]
Use frequency-division output
Encoder frequency-division output
Example) Setpoint: 20
PAO
PBO
Pitch
Note: Use encoder frequency-division output mode when the host controller is used as closed-loop feedback.
Pulse reference frequenc
Note: Synchronous output input pulse references is available only when H05-0 set to 0.
Frequency-division output complies with single-turn reference
10000
Pulse/rev
Apply
Position comparison output
Pulse output terminals:
Signal Name
Output Form
Output Terminal
Max. Pulse Frequency
Phase A signal
Differential output
PAO+, PAO-
2 Mpps
Phase B signal
Differential output
PBO+, PBO-
2 Mpps
Phase Z signal
Differential output
PZO+, PZO-
2 Mpps
Open collector output
PZ-OUT, GND
100 kpps
Note that the signal width of phase A/B pulses is determined by the motor speed. The signal width of phase Z pulses is half the signal width of phase A/B pulses.
<Previous
Next>
Parameter list
Save
Write

After preceding steps are done, you can view all the configured parameters in **Parameter list**. If parameters in the sub-process need to be adjusted, click the corresponding table to enter the sub-process directly and reset parameters.

After confirming parameters are set correctly, click **Write** to write parameters to the drive or click **Save** to save parameters as a recipe.

2.2.5 Servo ON

Switch on the S-ON signal.

When the servo drive is ready to run, the keypad displays "run". If there is no reference input at this moment, the motor does not rotate and stays locked. After a reference is input, the motor starts rotating.

Table 2–4 Checklist before operating the drive

Record	No.	Description
☐	1	During initial operation, set a proper command to make the motor run at low speed and check whether the motor rotates properly.
☐	2	Observe whether the motor rotates in the correct direction. Observe whether the motor rotates in the correct direction. If the direction of rotation is opposite to the expected direction, check the reference signal input and the reference direction setting signal.
☐	3	If the motor rotates in the correct direction, you can view the actual speed in H0b.00 and the average load rate in H0b.12 through the keypad or the software tool.
☐	4	After checking preceding conditions, adjust related parameters to make the motor operate as desired.
☐	5	Commission the drive according to Chapter "Adjustment".

Power-on sequence diagram

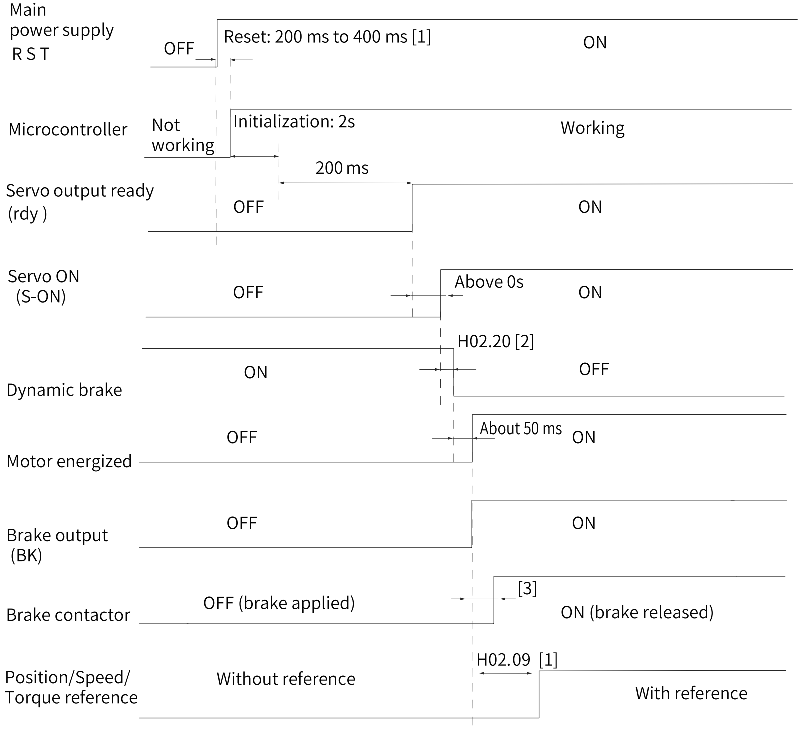


Figure 2-10 Power-on sequence diagram

Note

- [1] The reset time is determined by the setup time of the +5 V power supply of the microprocessor.
- [2] The dynamic brake is included in the standard configuration.
- [3] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [4] If the brake is not used, H02.09 is invalid.

Sequence diagram for stop at warning or fault

- No. 1 fault: Coast to stop, keeping de-energized status

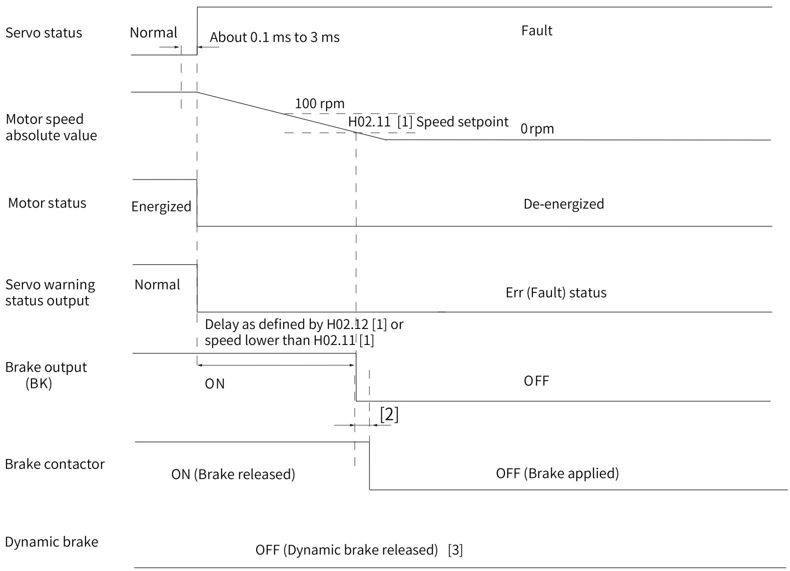


Figure 2-11 Sequence of "Coast to stop, keeping de-energized status" at No. 1 fault

Note

- [1] If the brake is not used, H02.11 and H02.12 are invalid.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [3] The dynamic brake is included in the standard configuration.

- No. 1 fault: Dynamic braking stop, keeping de-energized state

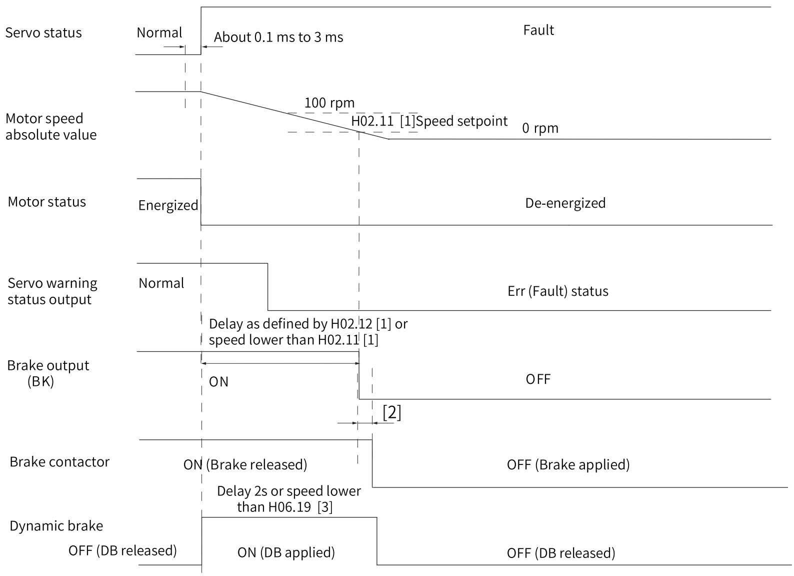


Figure 2-12 Sequence of "Dynamic braking stop, keeping de-energized state" at No. 1 fault

Note

- [1] If the brake is not used, H02.11 and H02.12 are invalid.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [3] The dynamic brake is included in the standard configuration.

- No. 1 fault: Dynamic braking stop, keeping dynamic braking state

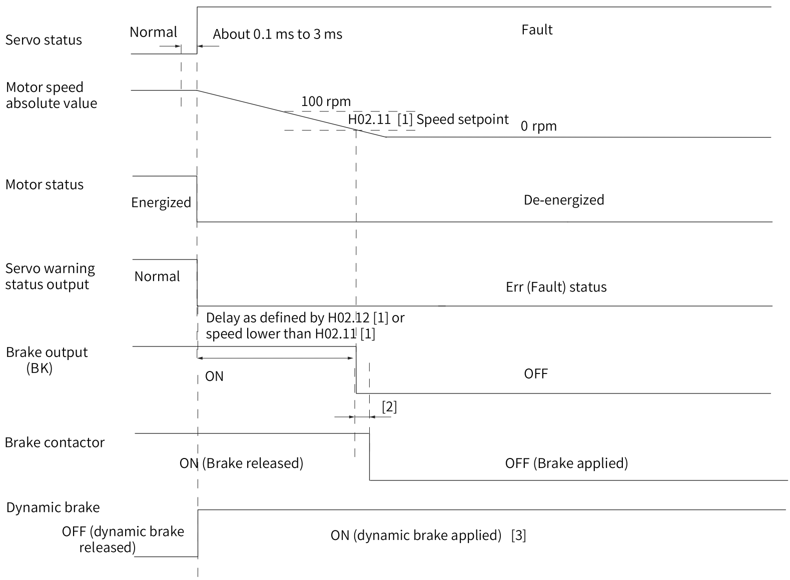


Figure 2-13 Sequence of "Dynamic braking stop, keeping dynamic braking state" at No. 1 fault

Note

- [1] If the brake is not used, H02.11 and H02.12 are invalid.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [3] The dynamic brake is included in the standard configuration.

- No. 2 fault (without brake): Coast to stop, keeping de-energized state

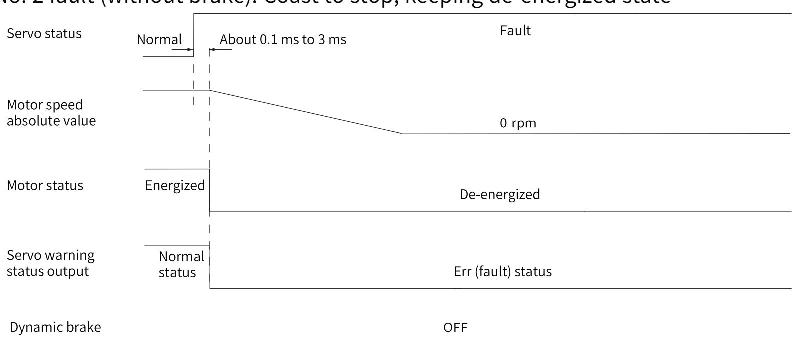


Figure 2-14 Sequence of "Coast to stop, keeping de-energized status" at No. 2 fault

- No. 2 fault (without brake): Stop at zero speed, keeping de-energized status

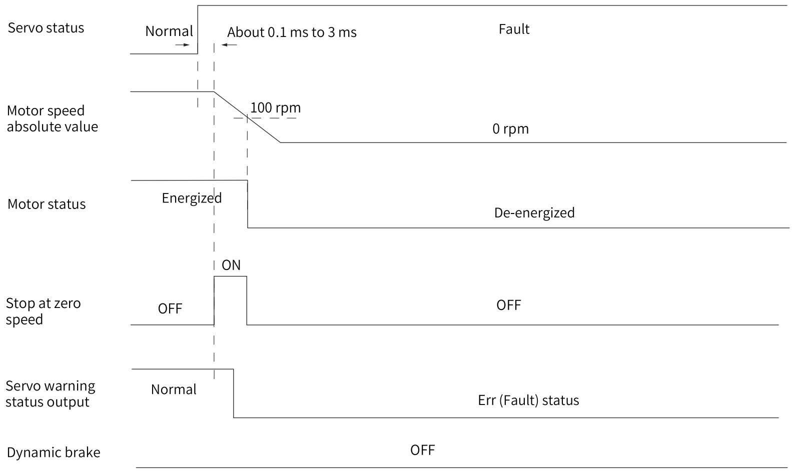


Figure 2-15 Sequence of "Stop at zero speed, keeping de-energized state" at No. 2 fault (without brake)

- No. 2 fault (without brake): Stop at zero speed, keeping dynamic braking state

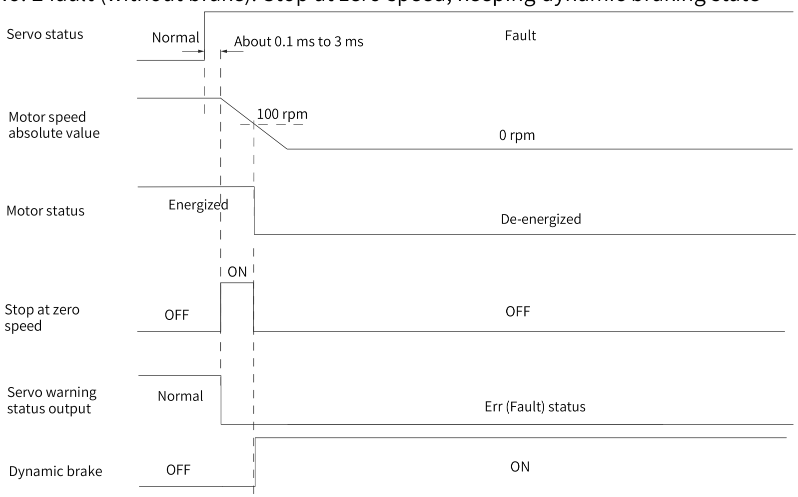


Figure 2-16 Sequence of "Stop at zero speed, keeping dynamic braking state" at No. 2 fault (without brake)

- No. 2 fault (without brake): Dynamic braking stop, keeping dynamic braking state

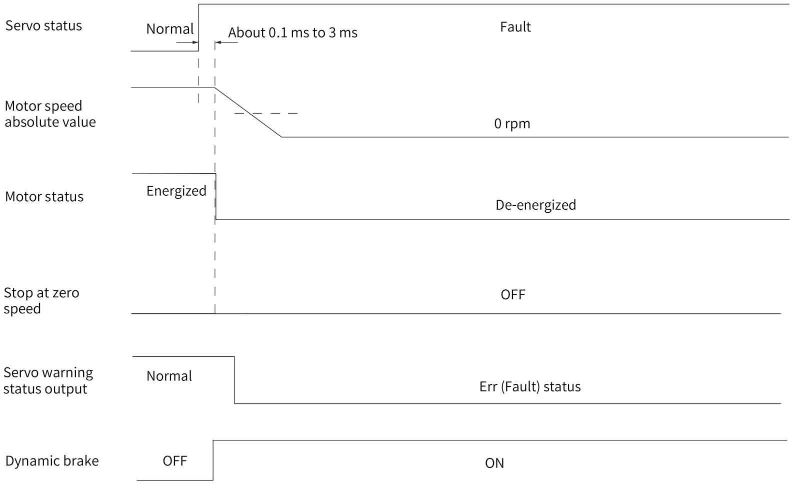


Figure 2-17 Sequence of "Dynamic braking stop, keeping dynamic braking state" at No. 2 fault (without brake)

- No. 2 fault (without brake): Dynamic braking stop, keeping de-energized state

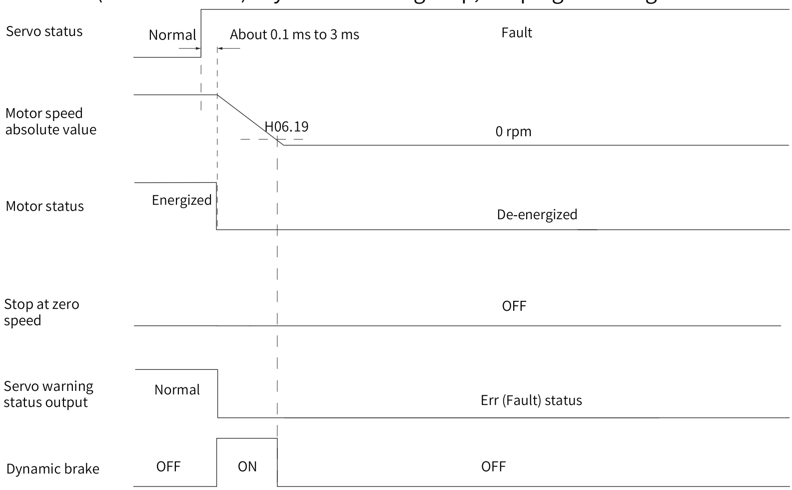


Figure 2-18 Sequence of "Dynamic braking stop, keeping de-energized state" at No. 2 fault (without brake)

- No. 2 fault (with brake): Stop at zero speed, keeping dynamic braking status

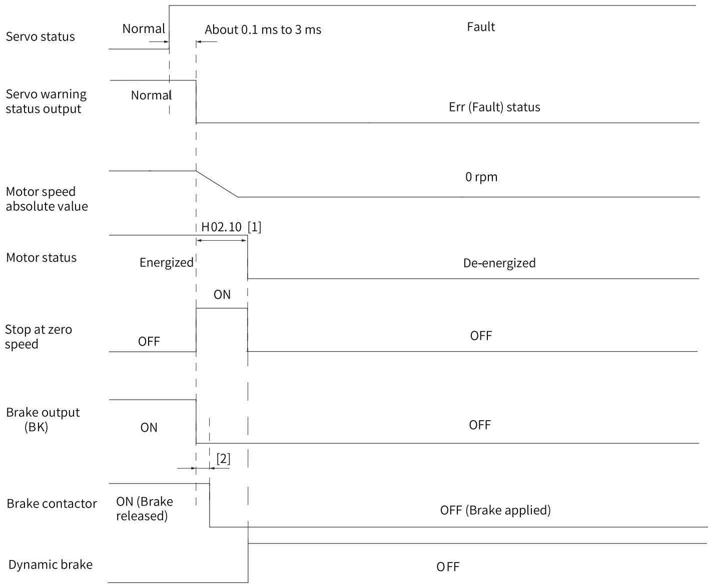


Figure 2-19 Sequence of "Stop at zero speed, keeping dynamic braking state" at No. 2 fault (with brake)

Note

- [1] If the brake is not used, H02.10 is invalid.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.

- When a No. 3 warning occurs on the servo drive, such as E900.0 (DI emergency braking), E950.0 (Positive limit switch warning), and E952.0 (Negative limit switch warning), the servo drive stops according to *"Figure 2–20 Sequence for warnings that cause stop" on page 76*.
- Warnings that cause stop: Stop at zero speed, keeping position lock status

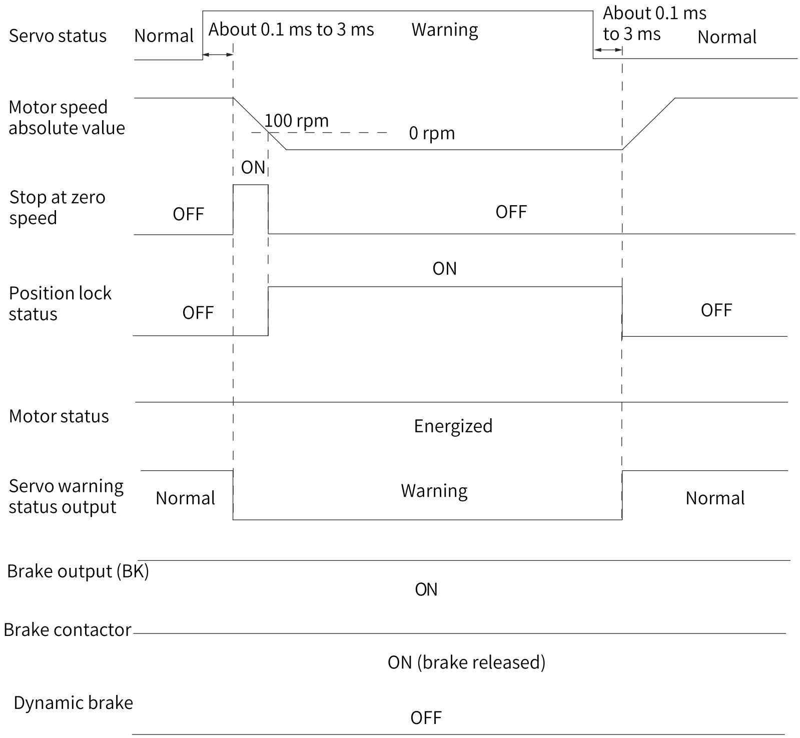


Figure 2-20 Sequence for warnings that cause stop

The other warnings do not affect the operation state of the drive. The sequence diagram for these warnings is shown in *"Figure 2–21 Sequence for warnings that do not cause stop" on page 77*.

- Warnings that do not cause stop

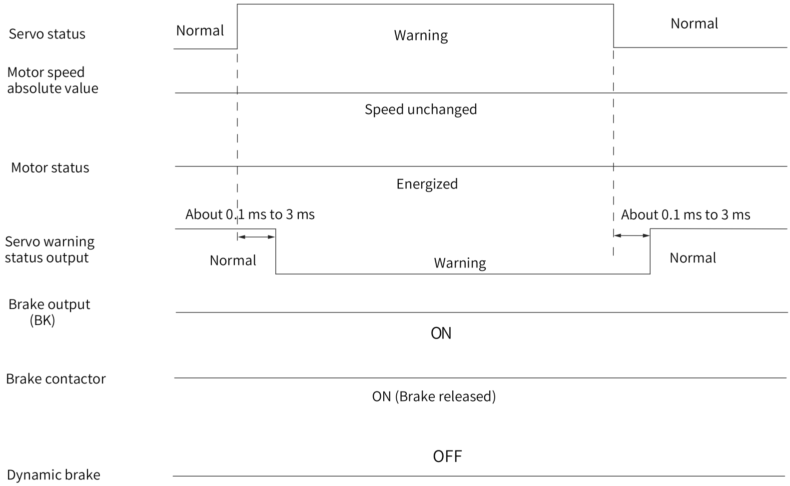


Figure 2-21 Sequence for warnings that do not cause stop

- Fault reset

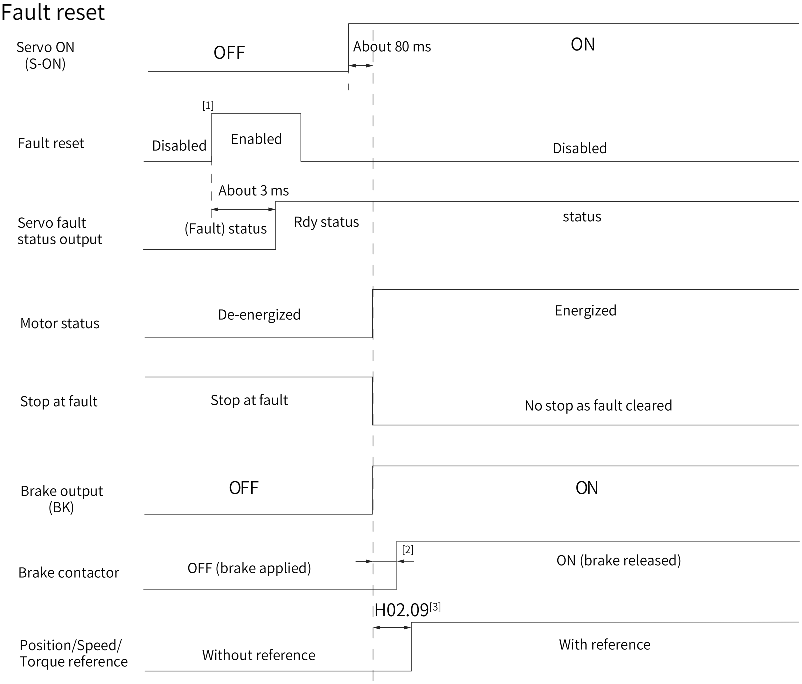


Figure 2-22 Sequence for fault reset

Note

- [1] The DI signal used for fault reset (FunIN.2: ALM-RST) is edge triggered.
- [2] For delay of brake contactor actions, see *"Table 2–2 " on page 54*.
- [3] If the brake is not used, H02.09 is invalid.

2.2.6 Servo OFF

Five type of stop modes are available for the servo drive: coast to stop, stop at zero speed, ramp to stop, stop at emergency-stop torque, and dynamic braking stop, along with three kinds of stop status: de-energized, position lock, and dynamic braking. See the following table for details.

Table 2–5 Comparison of the stop modes

Stop Mode	Description	Feature
Mode 1: Coast to stop	The motor is de-energized and coasts to 0 rpm. The deceleration time is affected by the mechanical inertia and mechanical friction.	Mode 1 features smooth and slow deceleration with small mechanical shock.
Mode 2: Stop at zero speed	The motor decelerates to 0 rpm immediately and stops.	Mode 4 features quick deceleration with obvious mechanical shock.
Mode 3: Ramp to stop	The motor decelerates to 0 rpm smoothly upon position/speed/torque reference input.	Mode 3 features smooth and controllable deceleration with small mechanical shock.
Mode 4: Stop at emergency-stop torque	The servo drive outputs a reverse braking torque to stop the motor.	Mode 4 features quick deceleration with obvious mechanical shock.
Dynamic braking	The servo motor is in the dynamic braking status.	Mode 4 features quick deceleration with obvious mechanical shock.

Table 2–6 Comparison of the stop status

Stop Status	Description
De-energized	The motor is de-energized and the motor shaft can be rotated freely after the motor stops rotating.
Position Lock	The motor shaft is locked and cannot be rotated freely after the motor stops rotating.
DB state	The motor is not energized after it stops rotating, and the motor shaft cannot be rotated freely.

The stop events can be divided into the following types: stop at S-ON OFF, stop at fault, stop at overtravel, emergency stop, quick stop, and halt. See the following descriptions for details.

Stop at S-ON OFF

Deactivate the S-ON signal through communication to make the drive stop according to the stop mode at S-ON OFF.

☆ Related parameters:

See *" H02.05" on page 146* for details.

Stop at fault

The stop mode varies with the fault type. For fault classification, see SV670P Series Servo Drive Troubleshooting Guide.

☆ Related parameters:

See *" H02.06" on page 146* for details.

See *" H02.08" on page 147* for details.

Stop at overtravel

★Definitions of terms:

- "Overtravel": The mechanical motion exceeds the designed range of safe movement.
- "Stop at overtravel": When a motion part moves beyond the range of safe movement, the limit switch outputs a level change to force the motor to stop.

☆ Related parameters:

See *" H02.07" on page 146* for details.

When overtravel occurs on a motor used to drive a vertical axis, the workpiece may fall. To prevent the risk of falling, set H02.07 (Stop mode at overtravel) to 1. When the workpiece moves linearly, install limit switches to prevent potential mechanical damage. When overtravel occurs, input a reverse running command to make the motor (workpiece) run in the opposite direction.

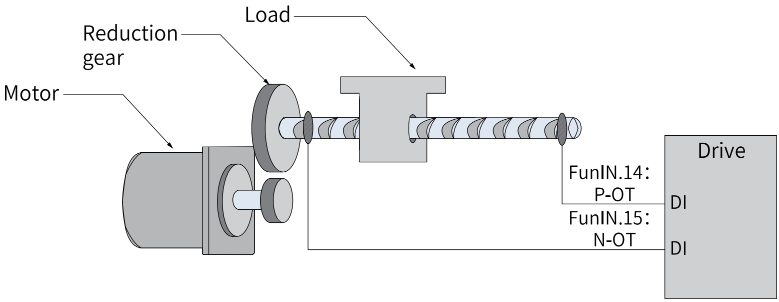


Figure 2-23 Installation of limit switches

To use the limit switches, assign FunIN.14 (P-OT, positive limit switch) and FunIN.15 (N-OT, negative limit switch) to two DIs of the servo drive and set the active logic of these DIs. This is to enable the servo drive to receive the level signals input from the limit switches. The servo drive enables or cancels the stop-at-overtravel status based on the DI level status.

☆ Related function No.

No.	Name	Function Name	Function
FunIN.14	P-OT	Positive limit switch	When the machine moves beyond the specified range, overtravel prevention applies. Inactive: Forward drive permitted Active: Forward drive inhibited
FunIN.15	N-OT	Negative limit switch	When the machine moves beyond the specified range, overtravel prevention applies. Inactive: Reverse drive permitted Active: Reverse drive inhibited

Emergency stop

There are two ways to enable emergency stop, as shown below:

- Using DI function 34: FunIN.34 (EmergencyStop)
- Using the auxiliary function: emergency stop (H0d.05)

When emergency stop is enabled, the motor stops according to the mode specified by the parameter H02.18 or the object dictionary 605Ah.

☆ Related function No.

No.	Name	Function Name	Function
FunIN.34	Emergency Stop	Braking	Inactive: Current operating state unaffected Active: Stop quickly as defined by H02.18, keeping position lock status, with E900.0 (DI emergency braking) reported

☆ Related parameters:

See *" H02.05" on page 146* for details.

See *" H02.15" on page 148* for details.

See *" H02.18" on page 149* for details.

Note

When SV670C uses CANopen for control, the emergency stop is the same as the quick stop.

Quick stop

Quick stop applies when bit 2 (Quick stop) of the control word 6040h is set to 0 (Active) during operation of the servo drive. The stop mode is defined by 605Ah.

☆ Related parameters:

See *" 605Ah" on page 441* for details.

Halt

The halt function applies when bit 8 of the control word 6040h is set to 1 (Halt) during operation of the servo drive. The halt mode is defined by 605Dh.

☆ Related parameters:

See *" 605Dh" on page 443* for details.

Caution

Do not set the deceleration time to an excessively low value. An excessively low value will lead to a long stop distance, incurring the risk of collision.

3 Adjustment

3.1 Overview

The servo drive must drive the motor as quick and accurate as possible to follow the commands from the host controller or internal setting. Gain adjustment needs to be performed to meet such requirement.

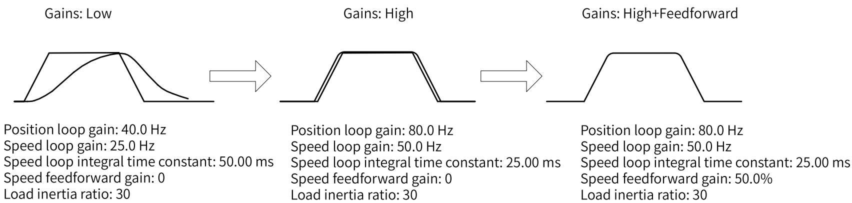


Figure 3-1 Example of gain tuning

The gain is defined by a combination of multiple parameters that affect each other. Such parameters include the position loop gain, speed loop gain, filter and load moment of inertia ratio. The values of these parameters must be balanced against each other during gain tuning.

Note

Before gain tuning, perform a trial run through jogging to ensure the motor operates properly.

The following figure shows the general flowchart for gain tuning.

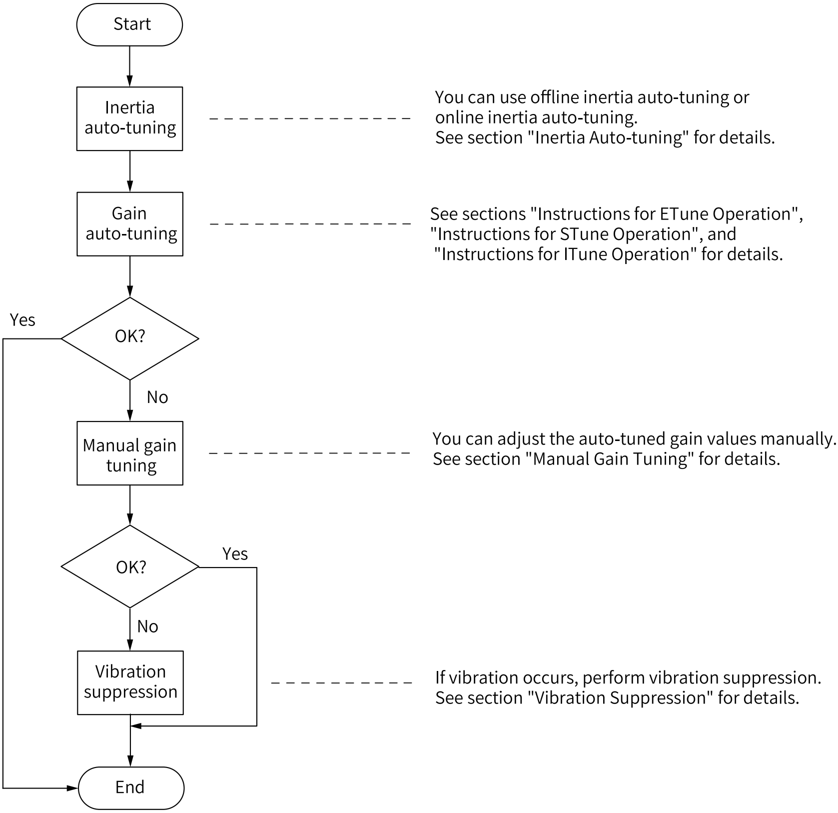


Figure 3-2 Step

Table 3–1 Description of gain tuning

Step			Function	Reference
1	Inertia auto-tuning	Offline	The servo drive calculates the load inertia ratio automatically through inertia auto-tuning.	*"3.2.1 Offline Inertia Auto-tuning" on page 86*
		Online	The host controller sends a command to make the motor rotate, and the servo drive calculates the load inertia ratio in real time.	*"3.2.2 Online Inertia Auto-tuning" on page 87*
2	Gain auto-tuning		The servo drive generates a group of gain parameters based on the correct inertia ratio.	*"3.3.1 ETune" on page 89*and *"3.3.2 STune" on page 96*

Step			Function	Reference
3	Manual gain tuning	Basic gains	If the auto-tuned gain values fail to deliver desired performance, fine-tune the gains manually to improve the performance.	*"3.4.1 Basic Parameters" on page 105*
		Reference filter	Smoothens the position, speed, and torque references.	*"3.4.3 Position reference filter" on page 114*
		Feedforward gain	Improves the follow-up behavior.	*"3.4.4 Feedforward gain" on page 114*
		Pseudo differential regulator	Adjusts the speed loop control mode to improve the anti-interference capability at low frequency range.	*"3.4.5 PDFF Control" on page 117*
		Torque disturbance observer	Improves the resistance against torque disturbance.	*"3.4.6 Torque disturbance observer" on page 119*
4	Vibration Suppression	Mechanical resonance	Suppresses mechanical resonance through the notch.	*"3.6.1 Mechanical Resonance Suppression" on page 128*
		Low-frequency resonance	Activate the filter used to suppress low-frequency resonance.	*"3.6.2 Low-Frequency Resonance Suppression at the Mechanical End" on page 134*

3.2 Inertia auto-tuning

The load inertia ratio (H08.15) is calculated through the following formula:

$$\text{Load inertia ratio} = \frac{\text{Total moment of inertia of mechanical load}}{\text{Moment of inertia of the motor}}$$

The load inertia ratio is a critical parameter of the servo system. A correct load inertia ratio facilitates commissioning.

You can set the load inertia ratio manually or get the inertia ratio through inertia auto-tuning.

The following two inertia auto-tuning modes are available:

- Offline Inertia Auto-tuning
  To enable offline inertia auto-tuning, use H0d.02 (Offline inertia auto-tuning) and make the motor rotate and execute inertia auto-tuning through the keypad. Offline inertia auto-tuning does not involve the host controller

- Online Inertia Auto-tuning
  Send a command to the servo drive through the host controller to make motor act accordingly to finish inertia auto-tuning. Online inertia auto-tuning involves the host controller.

Note

The following conditions must be fulfilled for an accurate calculation of the load inertia ratio during inertia auto-tuning:

- The actual maximum speed of the motor is higher than 150 rpm.
- The acceleration rate during acceleration/deceleration of the motor is higher than 3000 rpm/s.
- The load torque is stable without dramatic changes.
- The actual inertia ratio does not exceed 120.
- Inertia auto-tuning may fail in case of a large backlash of the transmission mechanism.

3.2.1 Offline Inertia Auto-tuning

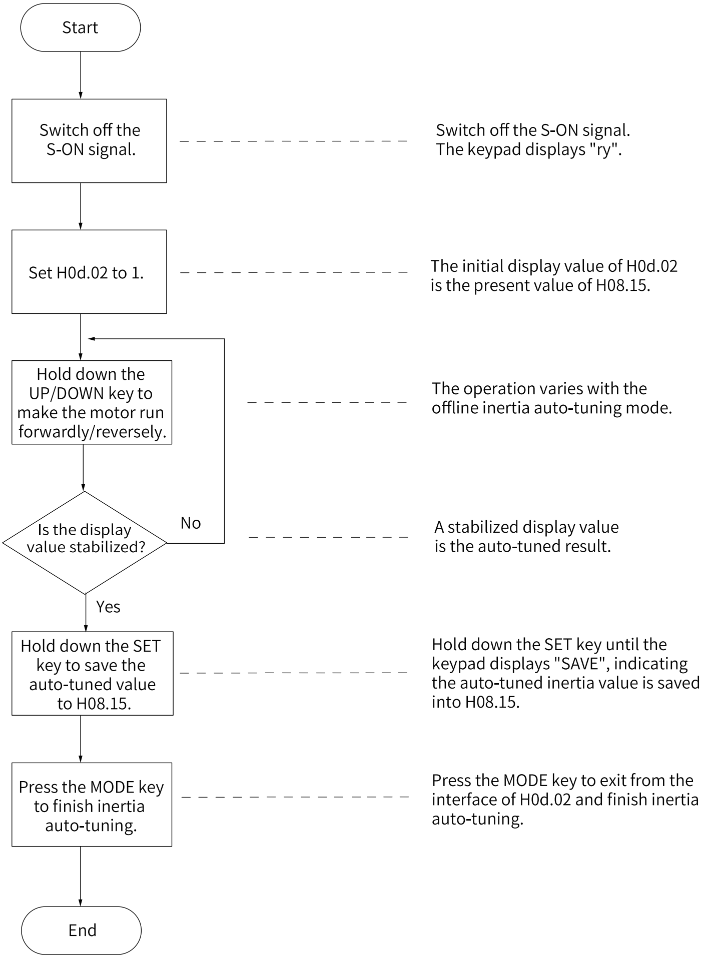


Figure 3-3 Offline inertia auto-tuning flowchart

Check the following before performing offline inertia auto-tuning:

The motor must meet the following requirements:

- A travel distance of more than one revolutions in the forward/reverse direction is available between the mechanical limit switches.
  Ensure limit switches are installed to the machine and a travel distance as described above is reserved to prevent overtravel during inertia auto-tuning.
- The requirements of H09.09 (Number of motor revolutions per inertia auto-tuning) are met.

View the current values of H09.06 (Maximum speed for inertia auto-tuning), H09.07 (Time constant for accelerating to the maximum speed during inertia auto-tuning), and H09.09. Ensure that the movement travel of the motor at the stop position is greater than the value of H09.09; otherwise, decrease H09.06 or H09.07 until the requirements are met.

Operating procedure:

1. Switch off the S-ON signal.
2. In parameter display mode, switch to H0d.02 and press SET to enable offline inertia auto-tuning.
3. Press the UP/DOWN key to perform offline inertia auto-tuning.
4. To stop the drive, release the UP/DOWN key. To restart auto-tuning, press the UP/DOWN key again.
   The operating direction at start is determined by the UP/DOWN key. For applications requiring unidirectional movement, set H09.05 to 1.
5. Wait until the value displayed on the keypad is stabilized.
6. Hold the SET key down until the keypad displays "SAVE".
7. Press the MODE key to exit.

For applications requiring large load inertia, set H08.15 (Load moment of inertia) to the approximate value. preventing intense system vibration caused by a low initial inertia.

The following figure shows general flowchart for offline inertia auto-tuning.

☆ Related parameters:

See *" H0d.02" on page 279* for details.

See *" H09.05" on page 235* for details.

See *" H09.06" on page 235* for details.

See *" H09.07" on page 235* for details.

See *" H09.08" on page 236* for details.

See *" H09.09" on page 236* for details.

3.2.2 Online Inertia Auto-tuning

The servo drive supports online inertia auto-tuning. The online inertia auto-tuning flowchart is shown as follows.

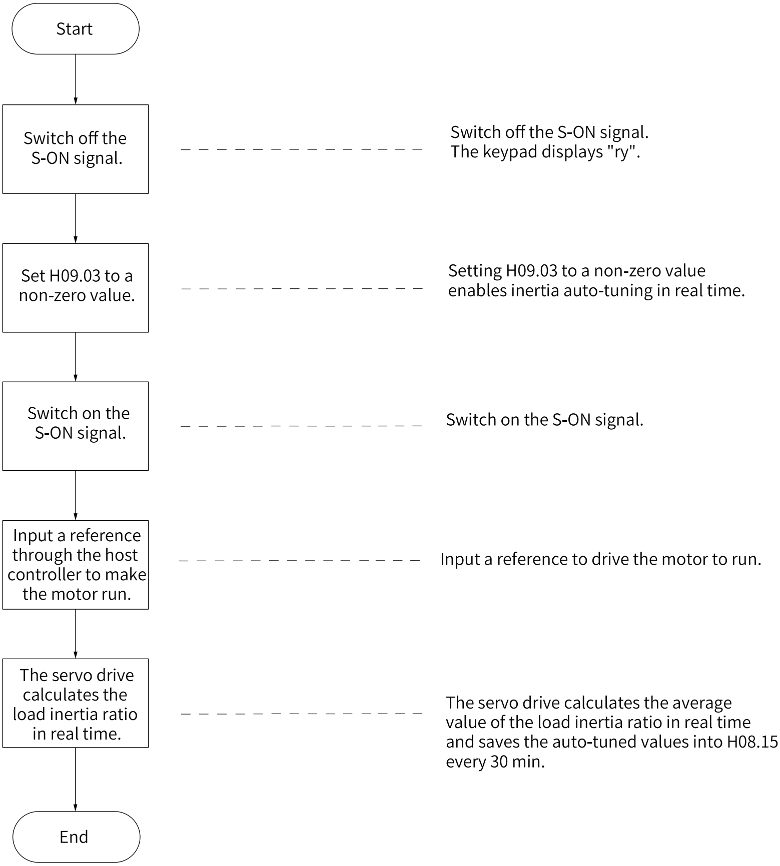


Figure 3-4 Online inertia auto-tuning flowchart

Note

H09.03 defines the real-time updating speed of the load inertia ratio (H08.15).

- H09.03 = 1: Applicable to cases where the actual load inertia ratio rarely changes, such as the machine tool and wood carving machine.
- H09.03 = 2: Applicable to cases where the load inertia ratio changes slowly.
- H09.03 = 3: Applicable to cases where the actual inertia ratio changes rapidly, such as handling manipulators.

☆Related parameter

See *" H09.03" on page 235* for details.

3.3 Gain auto-tuning

3.3.1 ETune

Overview

ETune is a wizard-type auto-adjustment function used to guide users to set corresponding curve trajectories and response parameters. After the curve trajectories and response parameters are set, the servo drive performs auto-tuning automatically to generate the optimal gain parameters. The auto-tuned parameters can be saved and exported as a recipe for use in other devices of the same model.

The ETune function is intended to be used in applications featuring slight load inertia change.

Description of ITune Operation

- **Operation flowchart**

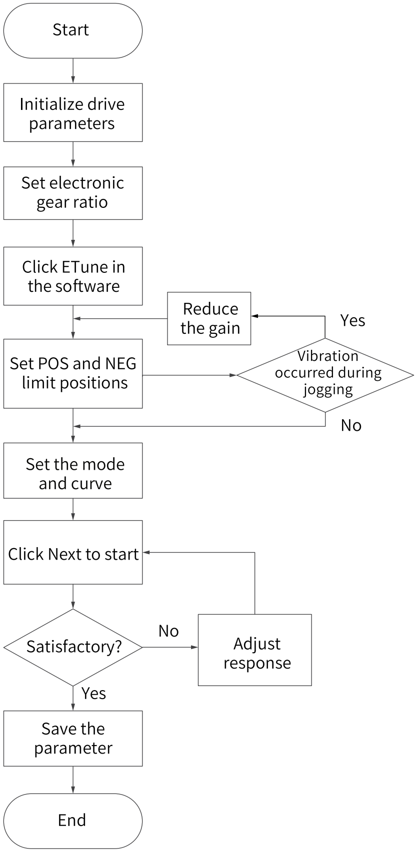
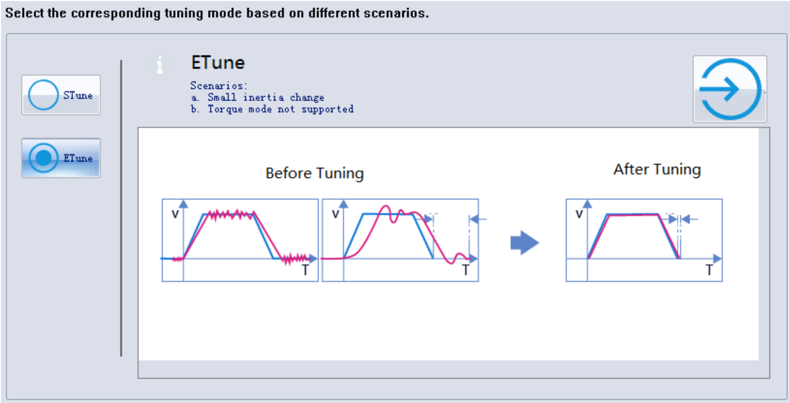


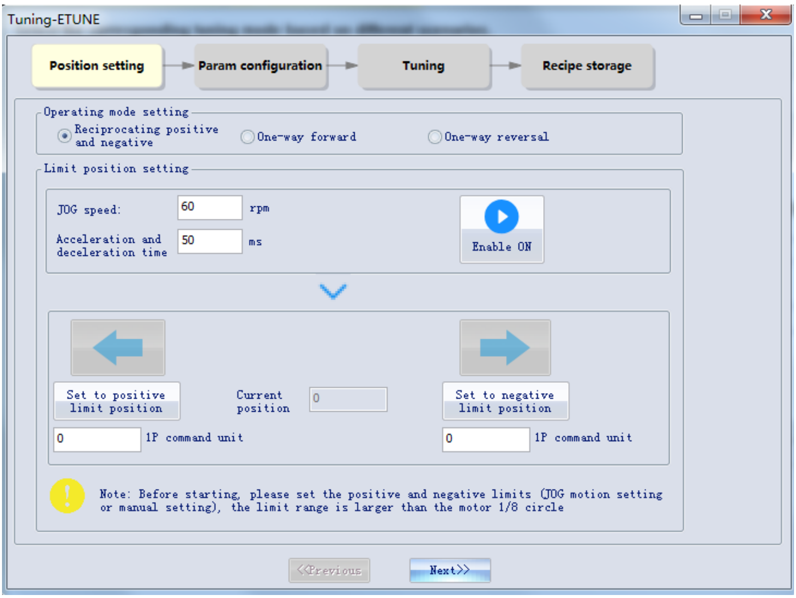
Figure 3-5 Operation flowchart

- **Description**

1. Click **Usability adjustment** in the software tool, and then click **ETune**.



2. Select any of the following three operation modes based on the operating direction allowed by the machine.
   - In the **Reciprocating po...** mode, the motor keeps reciprocating within the positive and negative position limits.
   - In the **One-way forward** mode, the motor takes the difference between the positive and negative position limits as the maximum distance per action and keeps running in the forward direction.
   - In the **One-way forward** mode, the motor takes the difference between the positive and negative position limits as the maximum distance per action and keeps running in the reverse direction.



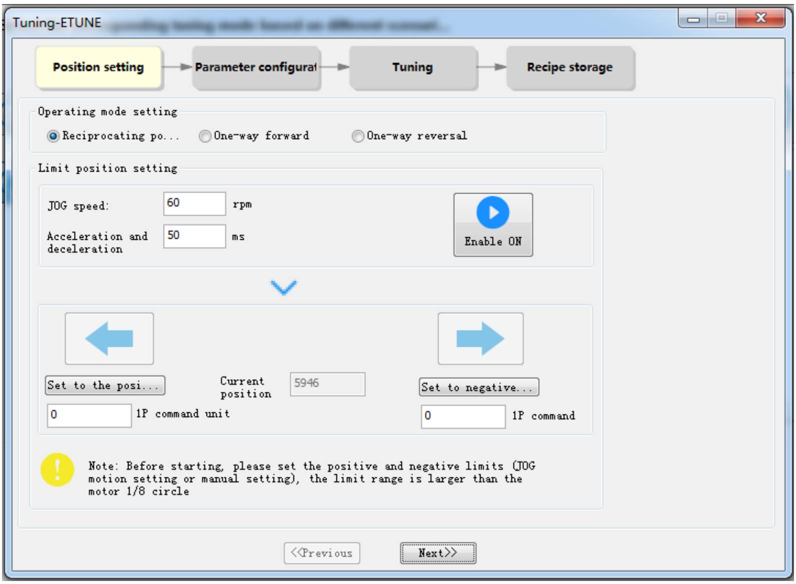
3. Designate the positive and negative limit positions allowed by the motor. The difference between the positive and negative limits defines the position reference pulses for the motor, which is also the value before multiplication/ division by the electronic gear ratio.

   You can set the positive and negative position limits through the following two methods.

   - Method 1: Click "Enable ON", and then click ⬅ to make the motor move to the positive position limit. Next, click "Set to positive limit position". Follow the same procedure for setting the negative position limit, and click "Enable OFF" (the "Enable ON" button turns to "Enable OFF" after a click).
   - Method 2: Enter the positive and negative limits directly.

Note

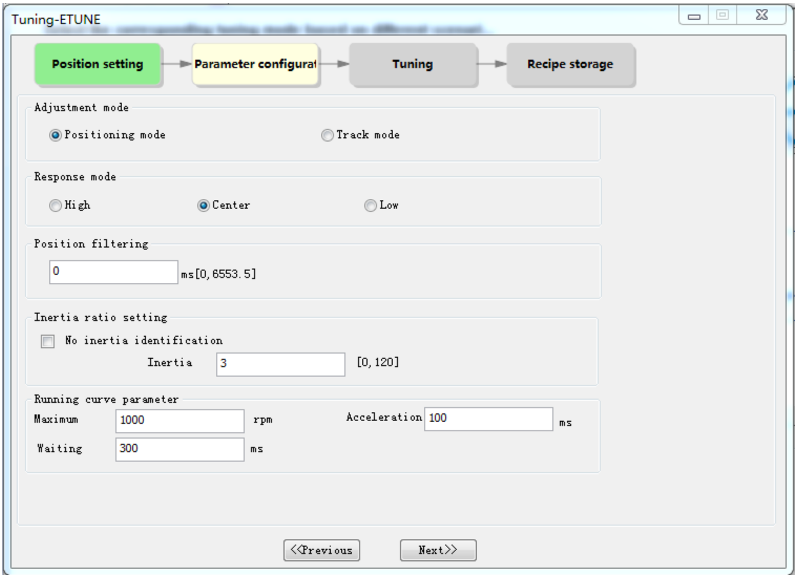
The difference between positive and negative position limits must be larger than 1/8 of one revolution. The larger the limit value, the better the adaptability of auto-tuned parameters, but the longer time will ETune operation take.



4. Click **Next** to switch to the mode parameter setting interface.

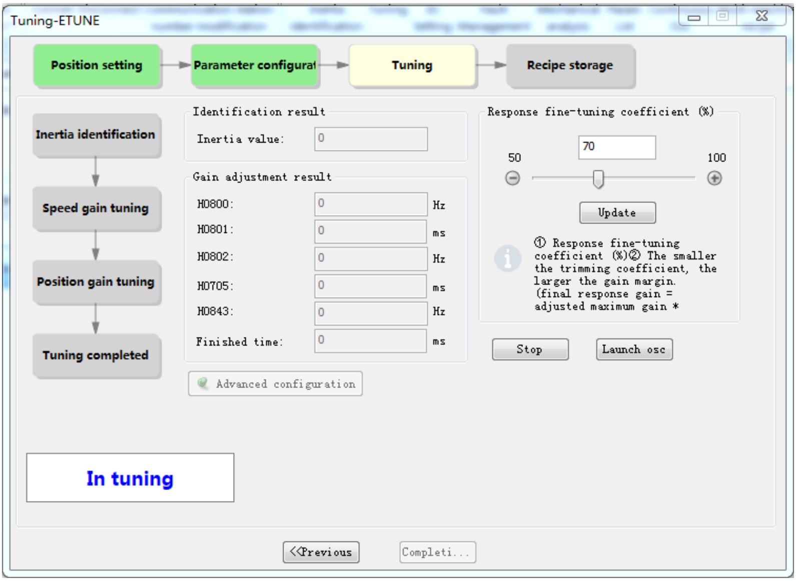
   The adjustment mode is divided into **Positioning mode** and **Track mode**.

   Auto-tuning of the inertia ratio is optional. If you choose not to perform inertia auto-tuning, set the correct inertia ratio (the inertia ratio can be modified directly). You can adjust the response level and position filter time constant based on the responsiveness needed and the position reference noise generated during operation. Then configure the motion profile by setting the maximum speed, acceleration/deceleration time and interval time for auto-tuning.

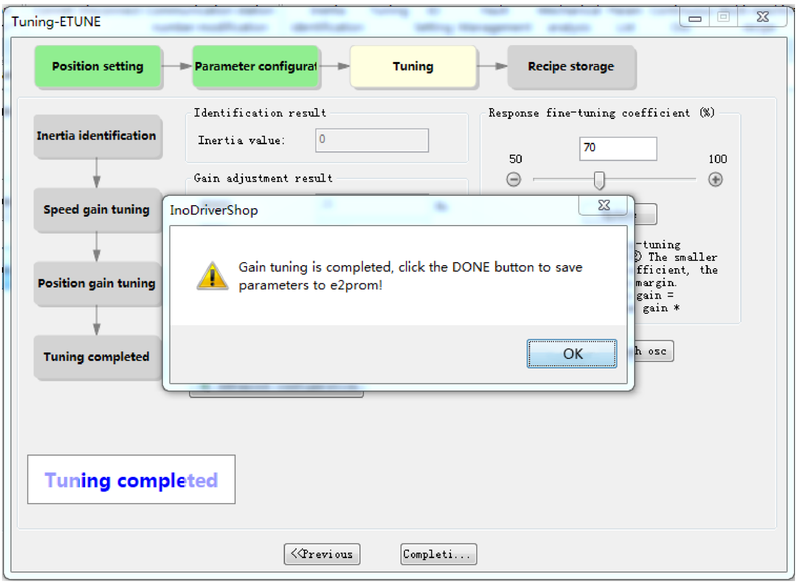


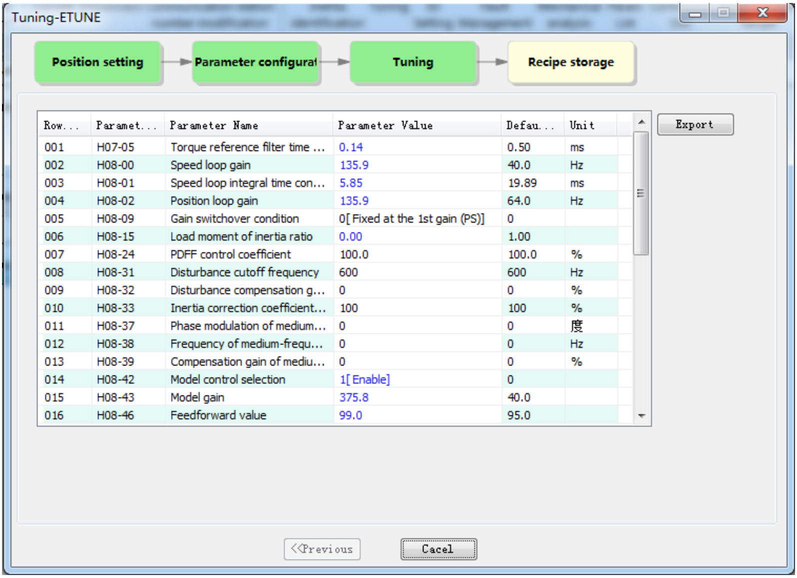
5. Click **"Next"** to start auto-tuning.

- If you choose to perform inertia auto-tuning, the drive starts inertia auto-tuning based on the set motion profile. After inertia auto-tuning is done, the drive starts gain auto-tuning.
- If you choose not to perform inertia auto-tuning on the start page, the drive starts gain auto-tuning directly after start.



6. During gain auto-tuning, if you modify the **Response fine-tuning coefficient** and click **"Update"**, gain auto-tuning will be continued based on the fine-tuning coefficient entered. After gain auto-tuning is completed, you can click **"Completi..."** to save parameters to EEPROM and export parameters as a recipe file.





Precautions

- You can adjust the maximum speed and acceleration/deceleration time of the motion profile based on actual conditions. The acceleration/deceleration time can be increased properly because positioning will be quickened after auto-tuning.
- If the acceleration/deceleration time is too short, overload may occur. In this case, increase the acceleration/deceleration time properly.
- For vertical axes, take anti-drop measures beforehand and set the stop mode upon fault to "Stop at zero speed".
- For lead screw transmission, shorten the travel distance if the tuning duration is too long.

Solutions to Common Faults

Fault Symptom	Cause	Solution
E662.0: Gains too low	Vibration cannot be suppressed.	Enable vibration suppression manually.
	Excessive overshoot occurs during positioning.	Check whether the positioning threshold is too low. Increase the acceleration/ deceleration time and reduce the response level.
	The command suffers from noise.	Modify the electronic gear ratio to improve the command resolution, or increase the command filter time constant in the parameter configuration interface.
	The current fluctuates.	Check whether the current of the machine fluctuates periodically.
E600.0: Inertia auto-tuning failure	Vibration cannot be suppressed.	Enable vibration suppression manually and perform the ETune operation.
	The auto-tuned values fluctuate dramatically.	Increase the maximum operating speed and decrease the acceleration/ deceleration time. For the lead screws, shorten the travel distance.
	Mechanical couplings of the load are loose or eccentric.	Rectify the mechanical faults.
	A warning occurs during auto-tuning and causes interruption.	Clear the fault and perform ETune again.
	The position reference filter time is set to an excessively high value.	Decrease the values of H05.04 to H05.06 and perform ETune again.

3.3.2 STune

Overview

STune performs gain auto-tuning based on the set stiffness level to fulfill the needs for rapidity and stability.

STune (mode 4) is turned on by default and will be turned off automatically after the drive runs as commanded for 5 minutes.

STune is intended to be used in applications featuring slight load inertia change. For applications featuring dramatic inertia change or where inertia auto-tuning is unavailable (due to low operating speed or low acceleration rate), turn off STune after initial power-on.

Note

In STune modes 3, 4 and 6, you need to perform load inertia auto-tuning through online inertia auto-tuning and ensure the following conditions are met:

- The load inertia changes quickly.
- The load torque changes quickly.
- The motor is running at a speed lower than 120 r/min.
- Acceleration/Deceleration is slow (lower than 1000 r/min per second).
- The acceleration/deceleration torque is lower than the unbalanced load/viscous friction torque.

If the conditions for online inertia auto-tuning cannot be fulfilled, set the correct inertia ratio manually.

Description of ITune Operation

- **Operation flowchart**

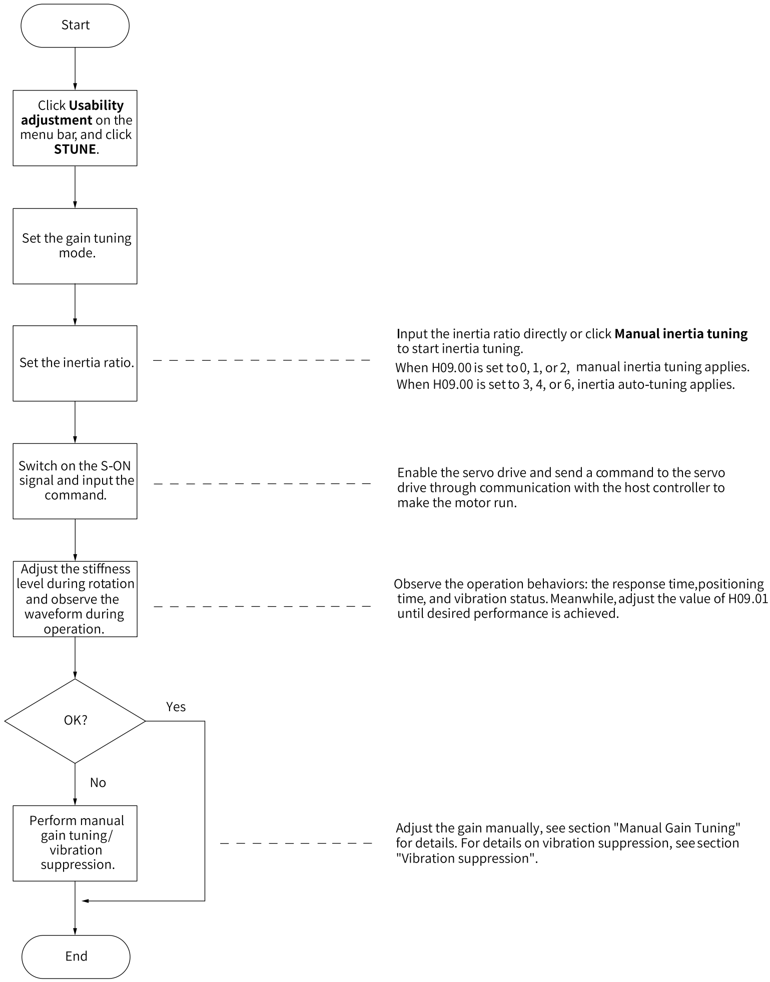


Figure 3-6 Operation flowchart

- **Description**

  You can set the gain auto-tuning mode through the keypad or the software tool.

  1. Select the gain auto-tuning mode.

     - In modes 0, 1 and 2 shown in the following table, you need to set the inertia ratio before stiffness adjustment. If the inertia is unknown, adjust the inertia manually. If vibration occurs on the machine, decrease the stiffness level before adjusting the inertia manually.

- In modes 3, 4, and 6 shown in the following table, you can perform adjustment through the wizard-type interface directly, without the need for setting an inertia ratio.

Mode	Name	Function
0	Inactive	The gains need to be adjusted manually.
1	Standard mode	Gains are set automatically based on the set stiffness level.
2	Positioning mode	Gains are set automatically based on the set stiffness level. This mode is applicable to occasions requiring quick positioning.
3	Interpolation mode + Inertia auto-tuning	Gains are set automatically based on the set stiffness level. In this mode, inertia is auto-tuned and vibration is suppressed automatically. This mode is applicable to multi-axis interpolation.
4	Normal mode + Inertia auto-tuning	Gains are set automatically based on the set stiffness level. The inertia is auto-tuned and vibration is suppressed automatically.
6	Quick positioning mode + Inertia auto-tuning	Gains are set automatically based on the set stiffness level. Inertia is auto-tuned and vibration is suppressed automatically. This mode is applicable to occasions requiring quick positioning.

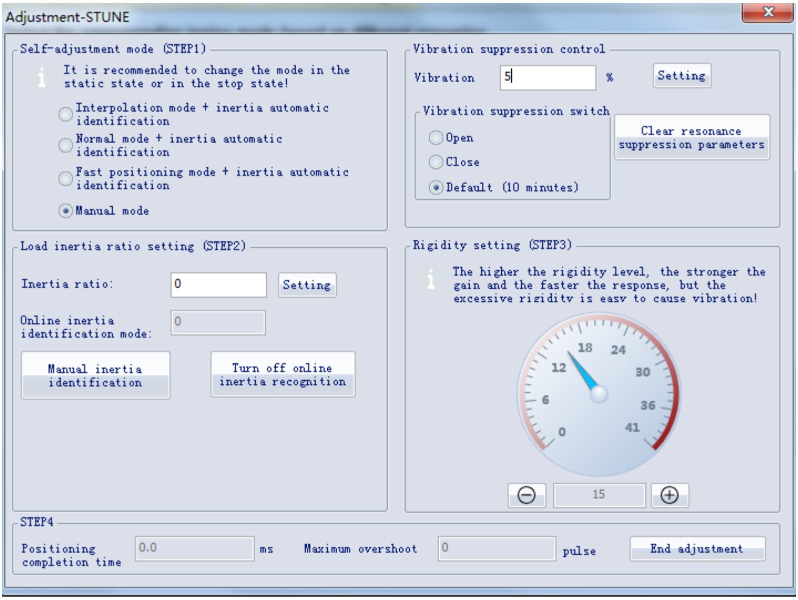
2. Adjust the stiffness level gradually during operation of the load. The present stiffness level value will be written to the drive automatically. Keep monitoring the operating waveform after increasing the stiffness level (increase by one level at a time) until desired performance is achieved.
3. In STune modes 3, 4, and 6, after the motor runs at a speed greater than 100 RPM for 5 minutes, the value of H09.00 is automatically restored to 0 and the system exits the STune mode.

   After tuning, you can set H09.00 to 0 to exit the STune mode.

   To modify the STune time, set H09.37.
4. In STune modes 3, 4, and 6, resonance will be suppressed automatically. If the resonance is not well suppressed, set H09.58 to 1 to clear the resonance suppression parameter settings, decrease the rigidity level, and perform STune again.
5. For multi-axis trajectories, perform single-axis commissioning first to determine the highest response of each axis and modify the response of each axis manually to ensure position responses of different axes are consistent.

   In STune modes 3 and 4, determine the minimum H08.02 (Position loop gain), set H09.00 to 0 for all the axes, and then set H08.02 to the save value.

- In STune mode 6, determine the minimum H08.43 (Model gain), set H09.00 to 0 for all the axes, and then set H08.43 to the save value.



Note

To ensure a stable operation of STune modes 3 and 4, gain parameters will be adjusted along with the inertia ratio when the inertia ratio is higher than 13. In multi-axis trajectories, responses may be inconsistent under the same stiffness level.

Precautions

Load inertia ratio range

- In scenarios requiring high responsivity, the inertia ratio must be lower than 500% and should not exceed 1000%.
  - For belt pulley or gear rack requiring not high rigidity and accuracy, the inertia ratio should not exceed 1000%.
  - For lead screw or cardan shaft requiring high rigidity and accuracy, the inertia ratio should not exceed 500%.
  - In scenarios where high positioning accuracy or responsivity is required, the inertia ratio should not exceed 200%.
- In scenarios requiring a certain accuracy and dynamic responsivity, the inertia ratio should not exceed 3000%.

- When the inertia ratio exceeds 3000%, it is hard to adjust and the trajectory control cannot be performed. It is only applicable to mechanisms for point-to-point control and rotary motion but the acceleration/deceleration time should be large.

Rigidity meter setting

The value range of H09.01 (Stiffness level) is 0 to 41. The level 0 indicates the weakest stiffness and lowest gain and level 41 indicates the strongest stiffness and highest gain.

The following table lists the stiffness levels for different load types for your reference.

Table 3–2 Reference of stiffness levels

Recommended Stiffness Level	Load Mechanisms
Level 8 to level 12	Large-scale machineries
Level 12 to level 18	Applications with low stiffness such as the conveyors
Above level 18	Applications with high stiffness such as the ball screws and direct-connected motors

The following five gain auto-tuning modes are available.

- Standard rigidity meter mode (H09.00 set to 1)
  The 1st gain parameters (H08.00 to H08.02 and H07.05) are automatically updated and saved based on the rigidity level set in H09.01.

Table 3–3 Parameters updated automatically in the standard mode

Param. No.	Name
H08.00	Speed loop gain
H08.01	Speed loop integral time constant
H08.02	Position loop gain
H07.05	Filter time constant of torque reference

- Positioning mode (H09.00 = 2)
  Based on *"Table 3–3 " on page 101*, the 2nd gain parameters (H08.03 to H08.05 and H07.06) are also automatically updated and saved based on the rigidity level set in H09.01. In addition, the position loop gain in the 2nd gain parameters has a higher rigidity level than that in the 1st gain parameters.

Table 3–4 Parameters updated automatically in the positioning mode

Param. No.	Name	Description
H08.03	2nd speed loop gain	-
H08.04	2nd speed loop integral time constant	If H08.04 is set to remain at 512.00 ms, the 2nd speed loop integral action is invalid and only proportional control is used in the speed loop.
H08.05	2nd position loop gain	-
H07.06	2nd torque reference filter time constant	-

Values of speed feedforward parameters are fixed.

Table 3–5 Parameters with fixed values in the positioning mode

Param. No.	Name
H08.19	Speed feedforward gain
H08.18	Speed feedforward filter time constant

Values of gain switchover parameters are fixed.

Gain switchover is activated automatically in the positioning mode.

Param. No.	Name	Value	Description
H08.08	2nd gain mode setting	1	Switchover between the 1st gain set (H08.00...H08.02, H07.05) and 2nd gain set (H08.03...H08.05, H07.06) is active in the positioning mode. In other modes, the original setting is used.
H08.09	Gain switchover condition	10	In positioning mode, the gain switchover condition is that H08.09 is set to 10. In other modes, the original setting is used.
H08.10	Gain switchover delay	5.0 ms	In positioning mode, the gain switchover delay is 5.0 ms. In other modes, the original setting is used.
H08.11	Gain switchover level	50	In the positioning mode, the gain switchover level is 50. In other modes, the original setting is used.
H08.12	Gain switchover dead time	30	In the positioning mode, the gain switchover dead time is 30. In other modes, the original setting is used.

Note

In the gain auto-tuning mode, parameters updated along with H09.01 and those with fixed setpoints cannot be modified manually. To modify these parameters, set H09.00 (Gain auto-tuning mode) to 0 first.

- In STune mode 3, 4, or 6,
  resonance suppression will be performed automatically. When the load changes or the mechanical structure is re-installed, the system resonance frequency changes accordingly. Set H09.58 to 1 (Enable) and enable the STune mode again after clearing resonance suppression parameters.

  See *" H08.37" on page 227* for details.

  See *" H08.38" on page 227* for details.

  See *" H08.39" on page 227* for details.

  See *" H09.18" on page 238* for details.

  See *" H09.19" on page 239* for details.

  See *" H09.20" on page 239* for details.

  See *" H09.21" on page 239* for details.

  See *" H09.22" on page 239* for details.

  See *" H09.23" on page 240* for details.

  See *" H09.58" on page 246* for details.

Note

- If H09.00 is set to 3, 4, or 6, the drive will suppress vibration and perform inertia auto-tuning automatically within 10 min (or other time defined by H09.37) after power-on or stiffness level setting, and then the drive exits from auto-tuning. If inertia auto-tuning is deactivated automatically, switching to modes 3, 4, or 6 will not activate inertia auto-tuning.
- Do not set H09.00 to 3, 4, or 6 in applications with slow acceleration/deceleration, strong vibration, and unstable mechanical couplings.
- In applications where the inertia does not change, set H09.03 (Online inertia auto-tuning mode) to 1 (Enabled, changing slowly). In applications where the inertia changes quickly, set H09.03 to 3 (Enabled, changing quickly).

Solutions to Common Faults

E661: Gains too low

When the torque fluctuation detected by the drive exceeds the setpoint of H09.11 and cannot be suppressed, the rigidity level will be reduced automatically until reaching level 10 where E661 is reported.

- Vibration cannot be suppressed. Enable vibration suppression manually.
- The current fluctuates. Check whether the current of the machine fluctuates periodically.

See " H08.37" on page 227 for details.

See " H08.38" on page 227 for details.

See " H08.39" on page 227 for details.

See " H09.58" on page 246 for details.

3.3.3 ITune

Overview

ITune serves to stabilize responsiveness through auto-tuning based on the device and load types.

ITune is intended to be used in applications featuring slight load inertia change or where inertia auto-tuning is unavailable.

Description of ITune Operation

Step	Para.	Name	Description
1	H09.27	ITune mode	Function: Setting H09.27 to 1 enables the ITune function. Note: ITune mode 2 is manufacturer commissioning mode, which should be used with caution.
2	H09.28 H09.29	Minimum inertia ratio of ITune Maximum inertia ratio of ITune	Function: Used to adjust the inertia ratio range controlled by ITune. Adjustment method: The minimum and maximum inertia ratios of ITune are 0.0 and 30.0 by default. If the actual maximum load inertia ratio is higher than 30.0, increase the value of H09.29 to prevent positioning jitter. If the actual load inertia change range is small, set H09.28 and H09.29 based on actual conditions to achieve optimal control effect.
3	H09.26	ITune response	Function: Used to adjust the response capacity of ITune. Note: If the ITune responsivity cannot deliver desired effect, increase H08.20 properly. If resonance cannot be suppressed, decrease H08.26 properly.

See *" H09.18" on page 238* for details.

See *" H09.19" on page 239* for details.

See *" H09.20" on page 239* for details.

See *" H09.21" on page 239* for details.

See *" H09.22" on page 239* for details.

See *" H09.23" on page 240* for details.

See *" H09.24" on page 240* for details.

See *" H09.27" on page 240* for details.

See *" H09.28" on page 241* for details.

See *" H09.29" on page 241* for details.

Precautions

After ITune is enabled, inertia auto-tuning and gain switchover will be inhibited.

Solutions to Common Faults

Fault Symptom	Cause	Solution
E663.0: Gains too low	1. Vibration cannot be suppressed.	Enable vibration suppression manually.
	2. The reference is disturbed by noise.	Modify the electronic gear ratio to improve the reference resolution, or increase the reference filter time constant in the parameter configuration interface.
	3. The current fluctuates.	Check whether the current of the machine fluctuates periodically.

3.4 Manual gain tuning

3.4.1 Basic Parameters

When gain auto-tuning cannot fulfill the application needs, perform manual gain tuning. to achieve better result.

The servo system consists of three control loops, which are position loop, speed loop, and current loop from external to internal. The basic control diagram is shown in the following figure.

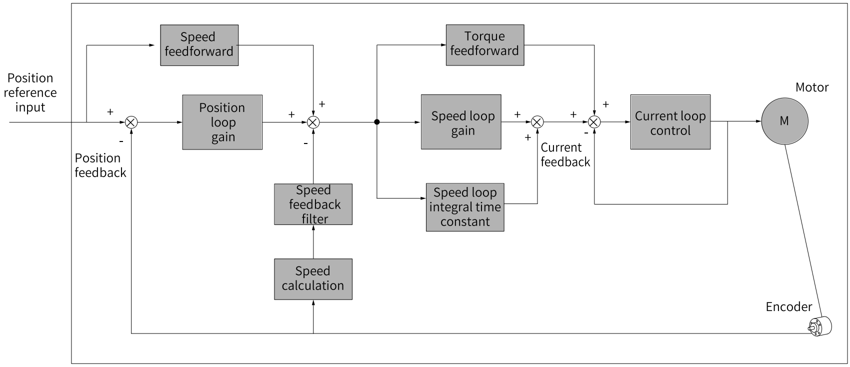


Figure 3-7 Basic control for manual gain tuning

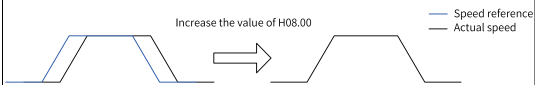
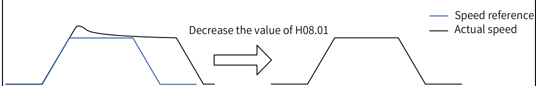
Note

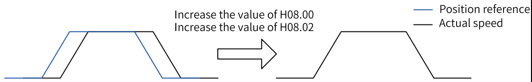
The responsiveness of the inner loop must be higher than that of the outer loop. Otherwise, the system may become unstable.

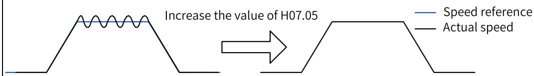
The current loop gain has been set with the highest level of responsiveness by default, avoiding the need for adjustment. you only need to adjust the position loop gain, speed loop gain and other auxiliary gains. For gain tuning in the position control mode, the position loop gain must be increased together with the speed loop gain, and the responsiveness of the former must be lower than the latter.

The following table describes how to adjust the basic gain parameters.

Table 3–6 Adjustment of gain parameters

Step	Param. No.	Name	Description
1	H08.00	Speed loop gain	Function: Determines the maximum frequency of a variable speed reference that can be followed by the speed loop. When H08.15 (Load inertia ratio) is set correctly, the maximum frequency that can be followed by the speed loop is the setpoint of H08.00.  Note: • Increasing the setpoint without incurring extra noise or vibration shortens the positioning time, stabilizes the speed, and improves the follow-up behavior. • If noise occurs, decrease the setpoint. • If mechanical vibration occurs, enable mechanical resonance suppression. For details, see *" Vibration Suppression" on page 128*.
2	H08.01	Speed loop integral time constant	Function: Eliminates the speed loop deviation.  Note: Set H08.01 according to the following formula: 500 ⩽ H08.00 x H08.01 ⩽ 1000 For example, when H08.00 (Speed loop gain) is set to 40.0 Hz, H08.01 (Speed loop integral time constant) must meet the following condition: 12.50 ms ⩽ H08.01 ⩽ 25.00 ms. Decreasing the setpoint strengthens the integral action and shortens the positioning time, but an excessively low setpoint may easily lead to mechanical vibration. An excessively high setpoint prevents the speed loop deviation from being cleared. When H08.01 is 512.00 ms, the integral action is invalid.

Step	Param. No.	Name	Description
3	H08.02	Position loop gain	Function: Determines the maximum frequency of a variable position reference that can be followed by the position loop. The maximum follow-up frequency of the position loop equals the value of H08.02.  Note: To ensure system stability, the maximum follow-up frequency of the speed loop must be 3 to 5 times higher than that of the position loop. $3 \leqslant \frac{2 \times \pi \times H08.00}{H08.02} \leqslant 5$ For example, when H08.00 is set to 40.0 Hz, the position loop gain must meet the following condition: 50.2 Hz $\leqslant$ H08.02 $\leqslant$ 83.7 Hz. Adjust the setpoint based on the positioning time. Increasing the setpoint shortens the positioning time and improves the anti-interference capacity of a motor at standstill. An excessively high setpoint may easily lead to system instability and oscillation.

Step	Param. No.	Name	Description
4	H07.05	Torque reference filter time constant	Function: Eliminates the high-frequency noise and suppresses mechanical resonance.  Note: Ensure the cutoff frequency of the torque reference low-pass filter is 4 times higher than the maximum follow-up frequency of the speed loop, as shown in the following formula: $\frac{1000}{2 \times \pi \times H07.05} \geqslant (H08.00) \times 4$ For example, when H08.00 is set to 40.0 Hz, the torque reference filter time constant must meet the following condition: H07.05 ⩽ 1.00 ms. If vibration occurs after H08.00 is increased, adjust H07.05 to suppress the vibration. For details, see *" Vibration Suppression" on page 128*. An excessively high setpoint weakens the responsiveness of the current loop. To suppress vibration at stop, increase H08.00 and decrease H07.05. To suppress vibration when the motor is in the stop state, decrease H07.05.

☆ Related parameters:

See *" H07.05" on page 210* for details.

See *" H08.00" on page 216* for details.

See *" H08.01" on page 217* for details.

See *" H08.02" on page 217* for details.

3.4.2 Gain Switchover

Gain switchover, which is active in the position control and speed control modes only, can be triggered by the internal servo status or an external DI signal to achieve the following purposes:

- Switching to the lower gain when the motor is at a standstill (servo ON) to suppress vibration
- Switching to the higher gain when the motor is at a standstill to shorten the positioning time

- Switching to the higher gain during operation of the motor to achieve better reference tracking performance
- Switching between different gain settings through an external signal to fit different conditions of the load devices

H08.08 = 0

When H08.08 is set to 0, the 1st gain (H08.00 to H08.02 and H07.05) is used, but you can switch between proportional control and proportional integral control through FunIN.3 (GAIN_SEL, gain switchover) for the speed loop.

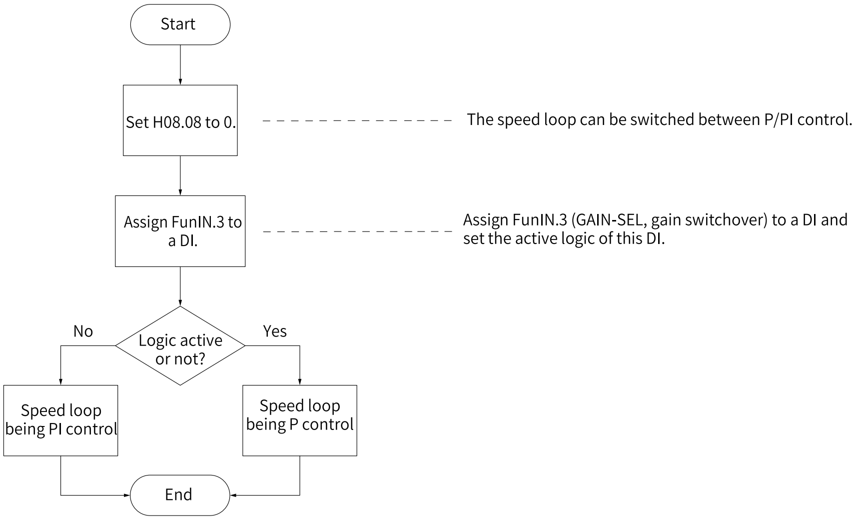


Figure 3-8 Gain switchover flowchart when H08.08 is set to 0

H08.08 = 1

You can switch between the 1st gain (H08.00 to H08.02 and H07.05) and 2nd gain (H08.03 to H08.05 and H07.06) based on the condition defined by H08.09.

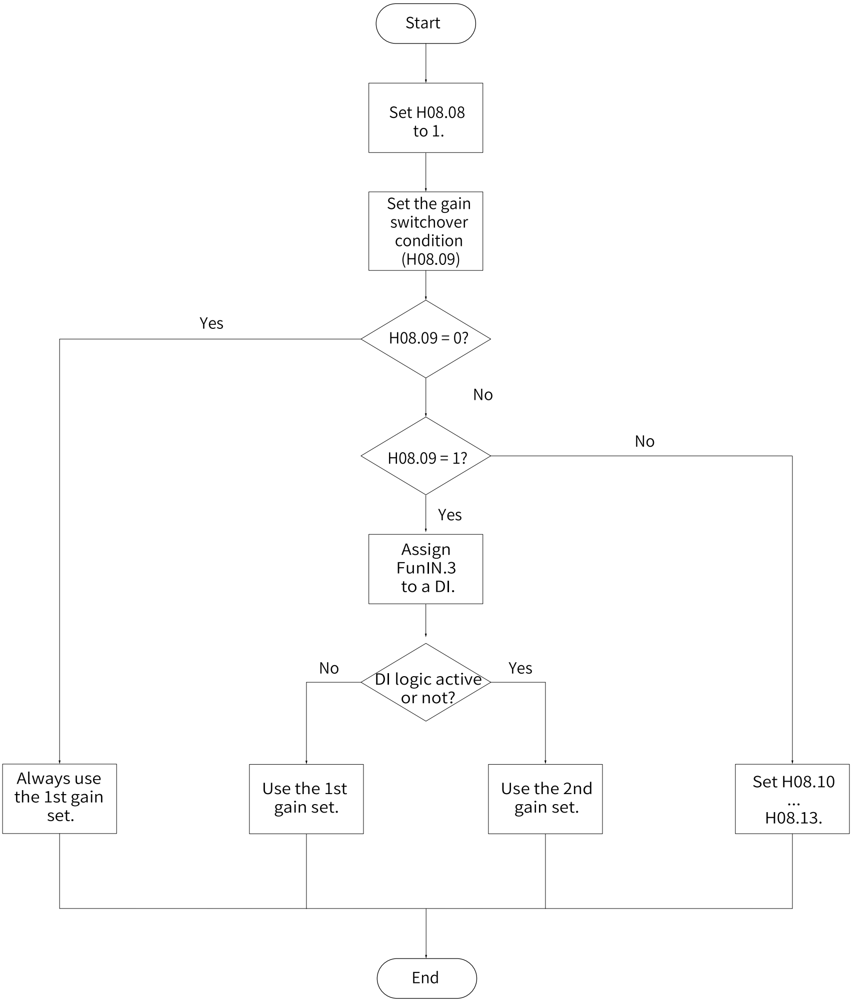
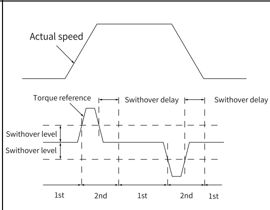
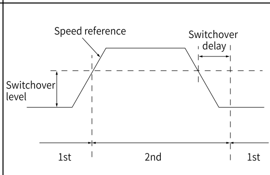
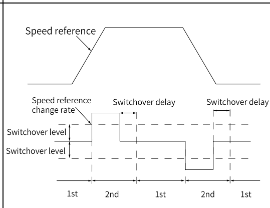
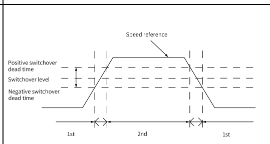
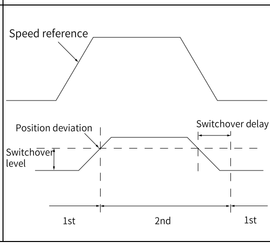
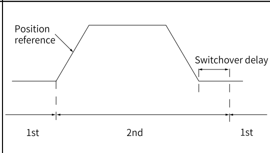
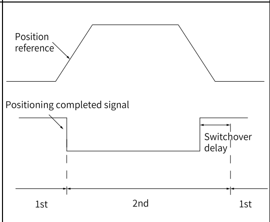
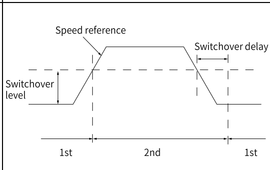


Figure 3-9 Gain switchover flowchart when H08.08 is set to 1

Table 3-8 shows diagrams and parameters for 11 kinds of gain switchover conditions. The following table describes the diagrams and related parameters of different conditions.

Table 3–7 Conditions for gain switchover

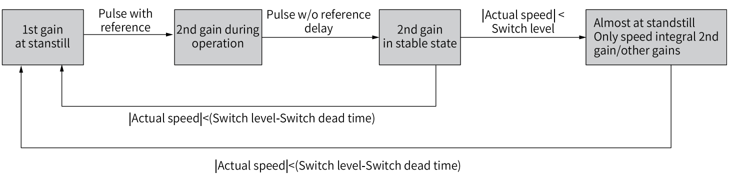
Gain Switchover Condition			Related Parameters		
H08.09 Setpoint	Condition	Diagram	Delay Time (H08.10)	Switchover Level (H08.11)	Switchover Dead Time (H08.12)
0	Fixed to the 1st gain set	-	Inactive	Inactive	Inactive
1	External DI signal	-	Inactive	Inactive	Inactive
2	Torque reference		Active	Active (%)	Active (%)
3	Speed reference		Active	Active	Active
4	Speed reference change rate		Active	Active (10 rpm/s)	Active (10 rpm/s)
5	Speed reference high/ low-speed threshold		Inactive	Active (rpm)	Active (rpm)
6	Position deviation		Active	Active (encoder unit)	Active (encoder unit)

Gain Switchover Condition			Related Parameters		
H08.09 Setpoint	Condition	Diagram	Delay Time (H08.10)	Switchover Level (H08.11)	Switchover Dead Time (H08.12)
7	Position reference		Active	Inactive	Inactive
8	Positioning uncompleted		Active	Inactive	Inactive
9	Actual speed		Active	Active (rpm)	Active (rpm)
10	Position reference + Actual speed	See the following note for details.	Active	Active (rpm)	Active (rpm)

Caution

H08.10 (Gain switchover delay) is valid only during switching to the 1st gain set.

Note



☆ Related parameters:

See " H08.08" on page 218 for details.

See " H08.09" on page 218 for details.

See " H08.10" on page 220 for details.

See " H08.11" on page 221 for details.

See " H08.12" on page 221 for details.

See " H08.13" on page 221 for details.

3.4.3 Position reference filter

Name	Function	Applicable Occasion	Impact of Excessive Filtering
Position reference filter	Filters the position references (encoder unit) divided or multiplied by the electronic gear ratio to smoothen the operation process of the motor and reduce shock to the machine.	The acceleration/ deceleration process is not performed on the position references sent from the host controller. The pulse reference frequency is low. The electronic gear ratio is larger than 10.	The response delay is prolonged.

3.4.4 Feedforward gain

Speed feedforward

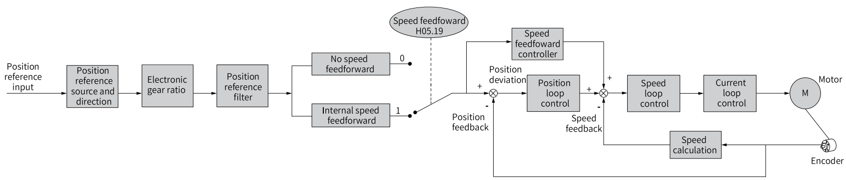


Figure 3-10 Operating procedure for speed feedforward control

Speed feedforward can be applied to the position control mode. When position control or full closed-loop is used, the speed feedforward function can be used to improve the speed reference responsiveness and reduce the position deviation at fixed speed.

Operating procedure for speed feedforward:

1. Set the speed feedforward signal source.

Set H05.19 (Speed feedforward control) to a non-zero value to enable the speed feedforward function. The corresponding signal source will be selected as well.

Param. No.	Name	Setpoint	Remarks
H05.19	Speed feedforward control	0: No speed feedforward	-
		1: Internal speed feedforward	Defines the speed corresponding to the position reference (encoder unit) as the speed feedforward signal source.
		2: 60B1h used as speed offset	-
		3: Zero phase control	-

2. Set speed feedforward parameters.

   Set the speed feedforward gain (H08.19) and speed feedforward filter time constant (H08.18).

   See " H08.18" on page 222 for details.

   See " H08.19" on page 222 for details.

Zero phase control

Zero phase control is used to compensate for the position deviation generated upon start delay of the position reference, reducing the position deviation upon start/stop in the position control mode.

The loop calculation model is shown in the following figure.

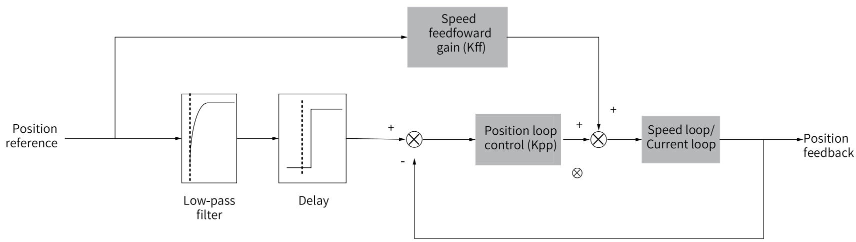


Figure 3-11 Zero phase control

See " H05.04" on page 173 for details.

See " H05.19" on page 178 for details.

See " H08.17" on page 222 for details.

Torque feedforward

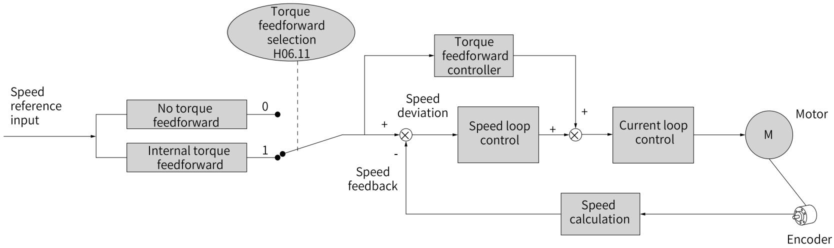


Figure 3-12 Operating procedures for torque feedforward control

In the position control mode, torque feedforward can be used to improve torque reference responsiveness and reduce the position deviation during operation at constant acceleration/deceleration rate.
In the speed control mode, torque feedforward can be used to improve speed reference responsiveness and reduce the speed deviation during operation at constant speed.

The procedure for setting torque feedforward is as follows:

1. Set the torque feedforward signal source.
   Set H06.11 (Torque feedforward control) to 1 to enable the torque feedforward function. The corresponding signal source will be selected as well.

Param. No.	Name	Setpoint	Remarks
H06.11	Torque feedforward control	0: No torque feedforward	-
		1: Internal torque feedforward	Defines the speed reference as the torque feedforward signal source. In the position control mode, the speed reference is outputted from the position controller.

2. Set torque feedforward parameters.

Param. No.	Name	Description
H08.20	Torque feedforward filter time constant	Function: • Increasing the value of H08.21 improves the responsivity but may cause overshoot during acceleration/deceleration. • Decreasing the value of H08.20 suppresses overshoot during acceleration/deceleration. Increasing the value of H08.20 suppresses the noise. Note: • Keep H08.20 to the default value, and then gradually increase the value of H08.21 from 0 to a certain value at which torque feedforward achieves the desired effect. • Adjust H08.20 and H08.21 repeatedly until a balanced performance is achieved.
H08.21	Torque feedforward gain	See this section for details.

3.4.5 PDFF Control

The pseudo derivative feedback and feedforward (PDFF) control can be used to adjust speed loop control in the non-torque control mode.

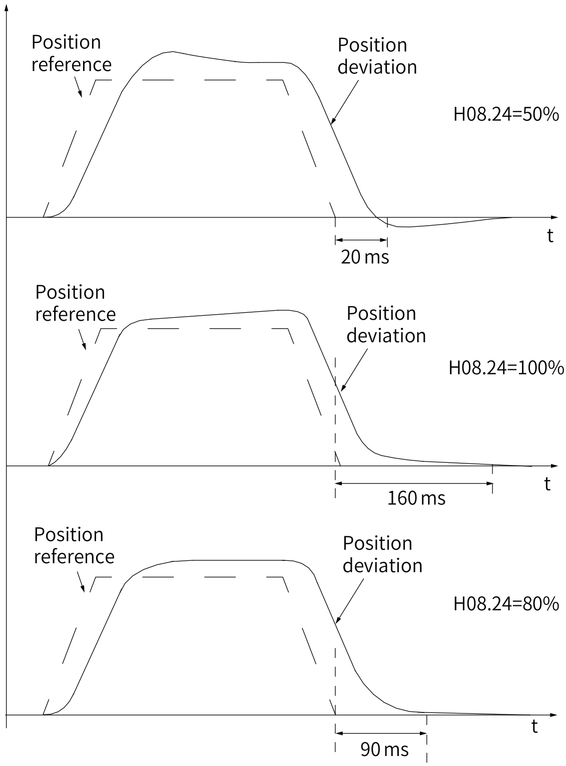


Figure 3-13 Example of PDFF control

Through adjusting the speed loop control method, PDFF control enhances the anti-disturbance capacity of the speed loop and improves the performance in following the speed references.

Param. No.	Name	Description
H08.24	PDFF control coefficient	Function: • Defines the control method of the speed loop in the non-torque control modes. Note: • Setting H08.24 to an excessively low value slows down the responsiveness of the speed loop. • When the speed feedback overshoots, gradually decrease the setpoint of H08.24 from 100.0 to a certain value at which the PDFF control achieves the desired effect. • When H08.24 is set to 100.0, the speed loop control method does not change and the default proportional integral control is used.

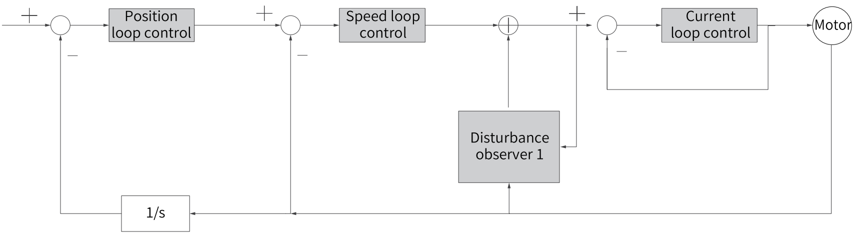
3.4.6 Torque disturbance observer

This function is intended to be used in the non-torque control modes.

Disturbance observer

The disturbance observer is used to observe external disturbance. You can set different cutoff frequencies and compensation values to observe and suppress the disturbance within the frequency range.

The following figure depicts the control block diagram for disturbance observer 1.



Note

1/s: Integral element

Param. No.	Name	Description
H08.31	Disturbance cutoff frequency	The higher the cutoff frequency, the more easily will vibration occur.
H08.32	Disturbance compensation gain	Defines the compensation percentage for the obeserver.
H08.33	Disturbance observer inertia correction coefficient	H08.33 needs to be changed only when the inertia ratio does not reflect the actual condition. The acting inertia is the product of the set inertia and H08.33. It is recommended to use the default value of H08.33.

☆Related parameters

See *" H08.31" on page 226* for details.

See *" H08.32" on page 226* for details.

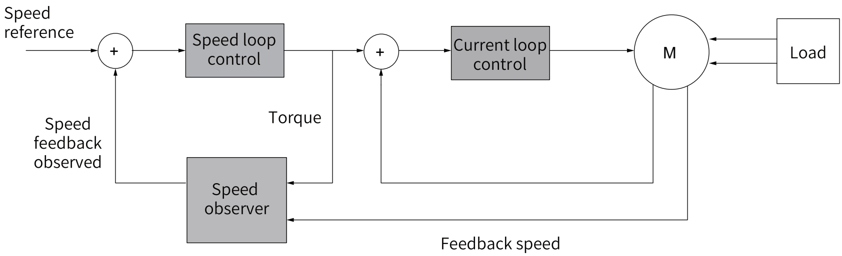
See *" H08.33" on page 226* for details.

3.4.7 Speed Observer

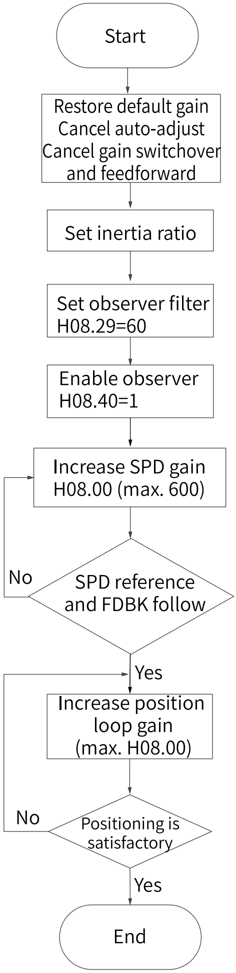
The speed observer, which facilitates quick positioning, applies in applications with slight load characteristic change and constant inertia.

It improves the responsiveness and filters high frequencies automatically, improving the gains and shortening the positioning time without incurring high-frequency vibration.

The block diagram for the speed observer is as follows.



Commissioning Steps



Related parameters

See " H08.00" on page 216 for details.

See " H08.27" on page 225 for details.

See " H08.28" on page 225 for details.

See " H08.29" on page 225 for details.

See " H08.40" on page 227 for details.

Note

- Before using the speed observer, set H08.15 (Load inertia ratio) to a proper value or perform inertia auto-tuning. A wrong inertia ratio can cause vibration.
- Setting H08.27, H08.28, or H08.29 to excessively low or high values can result in motor vibration.

3.4.8 Model Tracking

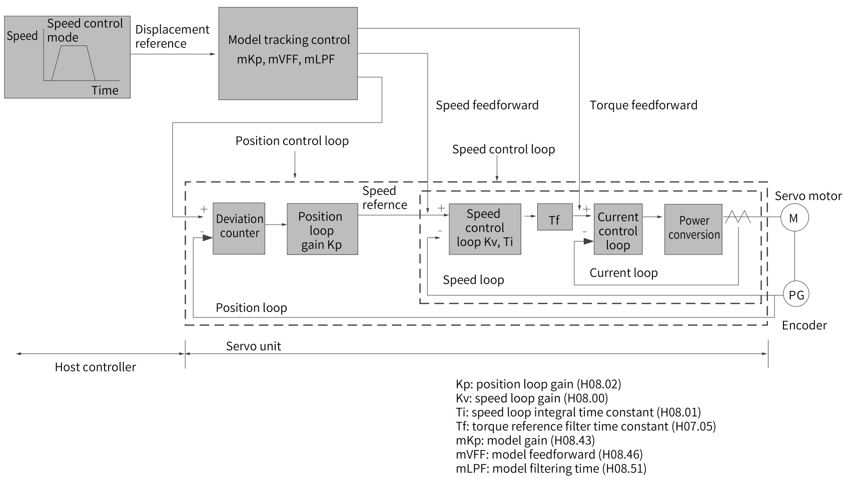
The model tracking control, which is only available in the position control mode, can be used to improve responsiveness and shorten the positioning time. It is only available in the position control mode.

Parameters used by model tracking are normally set automatically through ITune or ETune along with the gain parameters.

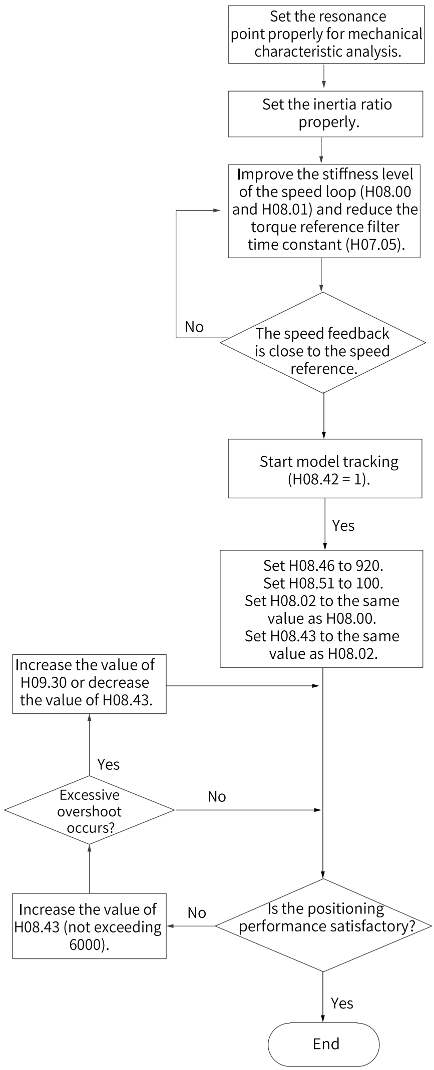
However, manual tuning is needed in the following situations:

- The auto-tuned values cannot deliver desired performance.
- Improving the responsiveness takes priority over the auto-tuned ro customized values.
- User-defined gain parameters or model tracking control parameters are needed.

The block diagram for model tracking control is as follows.



Commissioning Steps



Related parameters

See " H07.05" on page 210 for details.

See " H08.00" on page 216 for details.

See " H08.01" on page 217 for details.

See " H08.02" on page 217 for details.

See " H08.42" on page 228 for details.

See " H08.43" on page 228 for details.

See " H08.46" on page 228 for details.

Note

Ensure the set inertia is accurate. Otherwise, motor vibration may occur.

3.4.9 Friction Compensation

Friction compensation is used to reduce the impact of the friction on the operating effect during mechanical transmission. Use different positive/negative compensation values according to the direction of operation.

Note

Friction compensation is active only in the position control mode.

☆Related parameters

See " H09.32" on page 241 for details.

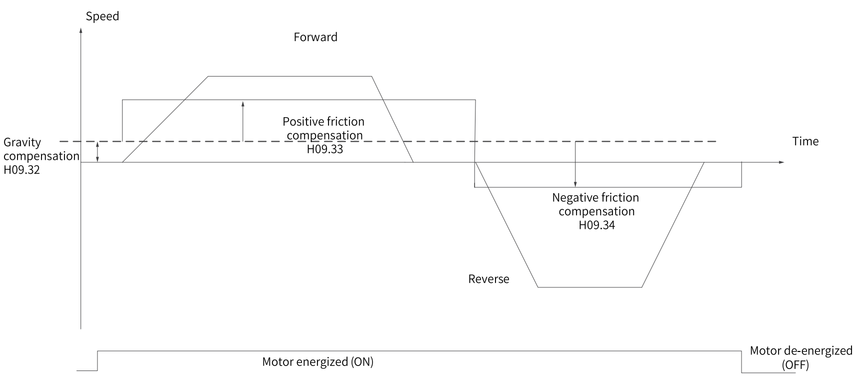
See " H09.33" on page 242 for details.

See " H09.34" on page 242 for details.

See " H09.35" on page 242 for details.

See " H09.36" on page 242 for details.

The diagram for friction compensation is as follows.



Note

When the speed is lower than the speed threshold, static friction applies. When the speed exceeds the speed threshold, dynamic friction applies. The compensation direction is determined by the direction of the position reference. Forward direction requires a positive compensation value. Reverse direction requires a negative compensation value.

3.5 Parameter Adjustment in Different Control Modes

Perform parameter adjustment in the sequence of "Inertia auto-tuning" => "Gain auto-tuning => "Manual gain tuning" in all the control modes.

3.5.1 Parameter Adjustment in the Position Control Mode

Obtain the value of H08.15 (Load inertia ratio) through inertia auto-tuning.

Gain parameters in the position control mode are listed in the following tables.

- 1st gain set:

Param. No.	Name	Function	Default
H07.05	Torque reference filter time constant	Defines the torque reference filter time constant.	0.50 ms
H08.00	Speed loop gain	Defines the speed loop proportional gain.	40.0 Hz
H08.01	Speed loop integral time constant	Defines the integral time constant of the speed loop.	19.89 ms
H08.02	Position loop gain	Defines the position loop proportional gain.	64.0 Hz

- 2nd gain set:

Param. No.	Name	Function	Default
H07.06	2nd torque reference filter time constant	Defines the torque reference filter time constant.	0.27 ms
H08.03	2nd speed loop gain	Defines the speed loop proportional gain.	75.0 Hz
H08.04	2nd speed loop integral time constant	Defines the integral time constant of the speed loop.	10.61 ms
H08.05	2nd position loop gain	Defines the position loop proportional gain.	120.0 ms

Param. No.	Name	Function	Default
H08.08	2nd gain mode setting	Defines the mode of the 2nd gain set.	1
H08.09	Gain switchover condition	Defines the gain switchover condition.	0
H08.10	Gain switchover delay	Defines the gain switchover delay.	5.0 ms
H08.11	Gain switchover level	Defines the gain switchover level.	50
H08.12	Gain switchover dead time	Defines the dead time of gain switchover.	30
H08.13	Position gain switchover time	Defines the position loop gain switchover time.	3.0 ms

- Common gain set

Param. No.	Name	Function	Default
H08.18	Speed feedforward filter time constant	Defines the filter time constant of the speed feedforward signal.	0.50 ms
H08.19	Speed feedforward gain	Defines the speed feedforward gain.	0.0%
H08.20	Torque feedforward filter time constant	Defines the filter time constant of the torque feedforward signal.	0.50 ms
H08.21	Torque feedforward gain	Defines the torque feedforward gain.	0.0%
H08.22	Speed feedback filtering option	Defines the speed feedback filtering function.	0
H08.23	Cutoff frequency of speed feedback low-pass filter	Defines the cutoff frequency of the first-order low-pass filter for speed feedback.	8000 Hz
H08.24	PDFF control coefficient	Defines the coefficient of the PDFF controller.	100.0%
H09.30	Torque disturbance compensation gain	Defines the torque disturbance compensation gain.	0.0%
H09.31	Filter time constant of torque disturbance observer	Defines the filter time constant of the disturbance observer.	0.5 ms
H09.04	Low-frequency resonance suppression mode	Defines the low-frequency resonance suppression mode.	0

Param. No.	Name	Function	Default
H09.38	Frequency of low-frequency resonance	Defines the frequency of the low-frequency resonance suppression filter.	100.0 Hz
H09.39	Low-frequency resonance frequency filter setting	Defines the setting of low-frequency resonance suppression filter.	2

Perform gain auto-tuning to get the initial values of the 1st gain set (or 2nd gain set) and the common gain set.

Fine-tune the following gains manually.

Param. No.	Name	Function
H07.05	Torque reference filter time constant	Defines the torque reference filter time constant.
H08.00	Speed loop gain	Defines the speed loop proportional gain.
H08.01	Speed loop integral time constant	Defines the integral time constant of the speed loop.
H08.02	Position loop gain	Defines the position loop proportional gain.
H08.19	Speed feedforward gain	Defines the speed feedforward gain.

3.5.2 Parameter Adjustment in the Speed Control Mode

Parameter adjustment in the speed control mode is the same as that in the position control mode, except for the position loop gain (H08.02 and H08.05). For details, see *"3.5.1 Parameter Adjustment in the Position Control Mode" on page 125*.

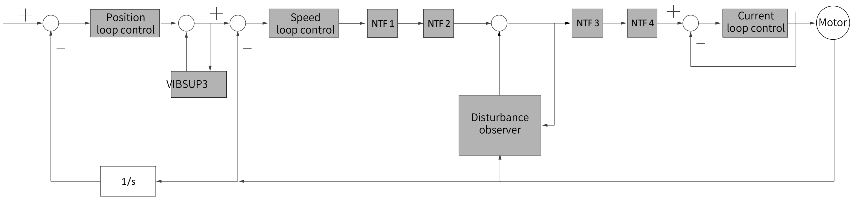
3.5.3 Parameter Adjustment in the Torque Control Mode

Parameter adjustment in the torque control mode are differentiated based on the following conditions:

- If the actual speed reaches the speed limit, the adjustment method is the same as that described in *"3.5.2 Parameter Adjustment in the Speed Control Mode" on page 127*.
- If the actual speed does not reach the speed limit, the adjustment method is the same as that described in *"3.5.2 Parameter Adjustment in the Speed Control Mode" on page 127*, except the position/speed loop gain and speed loop integral time constant.

3.6 Vibration Suppression

The block diagram for vibration suppression is as follows.



Steps:

- NTF1–4: 1st notch to 4th notch
- VIBSUP3: Suppression of medium- and low-frequency vibration reduction applied at a carrier frequency lower than 8 k under 300 Hz
- 1/s: Integral element

☆ Related parameters:

See " H08.53" on page 228 for details.

See " H08.54" on page 229 for details.

See " H08.56" on page 229 for details.

Note

- Jitter suppression phase modulation coefficient: Defines synchronous phase adjustment of the compensation value and vibration. It is recommended to use the default value. Adjustment is needed when the phase of the compensation deviates sharply from the phase of the vibration.
- Jitter suppression frequency: Defines the jitter frequency that needs to be suppressed.
- Jitter suppression compensation coefficient: Defines the compensation coefficient for jitter suppression.

3.6.1 Mechanical Resonance Suppression

Resonance frequency is present in the mechanical system. When the gain of the drive increases, resonance may occur near the resonance frequency, disabling further increase of the gain.

Mechanical resonance can be suppressed in the following two methods:

Torque reference filter (H07.05, H07.06)

To suppress the mechanical resonance, set the filter time constant to enable the torque reference to be attenuated in the frequency range above the cutoff frequency.

Filter cutoff frequency fc (Hz) = 1/[2π x H07.05 (ms) x 0.001]

Notch

The notch reduces the gain at certain frequencies to suppress mechanical resonance. After the vibration is suppressed by the notch, you can continue to increase the gain. The operating principle of the notch is shown in the following figure.

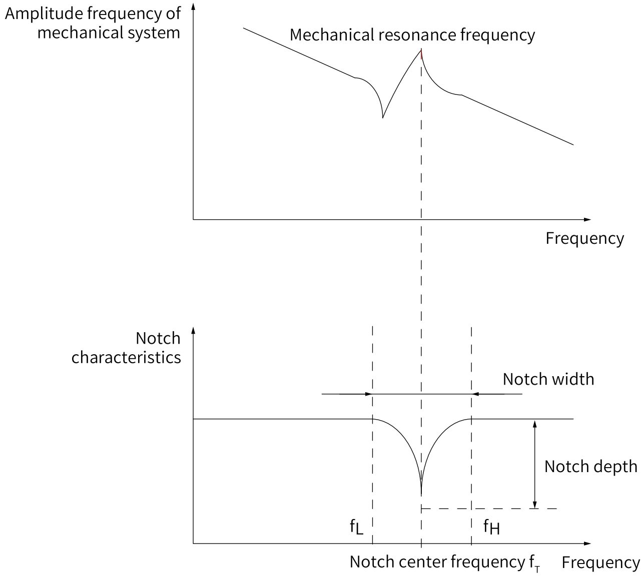


Figure 3-14 Operating principle of the notch

A total of four notches can be used, and each notch is defined by three parameters: frequency, width level, and depth level. The 1st and 2nd notches are manual notches whose parameters needs to be set by the user. Parameters of the 3rd and 4th notches can be either set by the user or set automatically after being configured as an adaptive notch (H09.02 =1 or 2).

Table 3–8 Description of notch parameters

Item	Manual Notch		Manual/Adaptive Notch	
	1st Notch	2nd Notch	3rd Notch	4th Notch
Frequency	H09.12	H09.15	H09.18	H09.21
Width level	H09.13	H09.16	H09.19	H09.22
Depth level	H09.14	H09.17	H09.20	H09.23

Note

- When the frequency is 8000 Hz (default), the notch is inactive.
- The adaptive notch is preferred for resonance suppression. The manual notch can be used in cases where the adaptive notch cannot deliver desired performance.

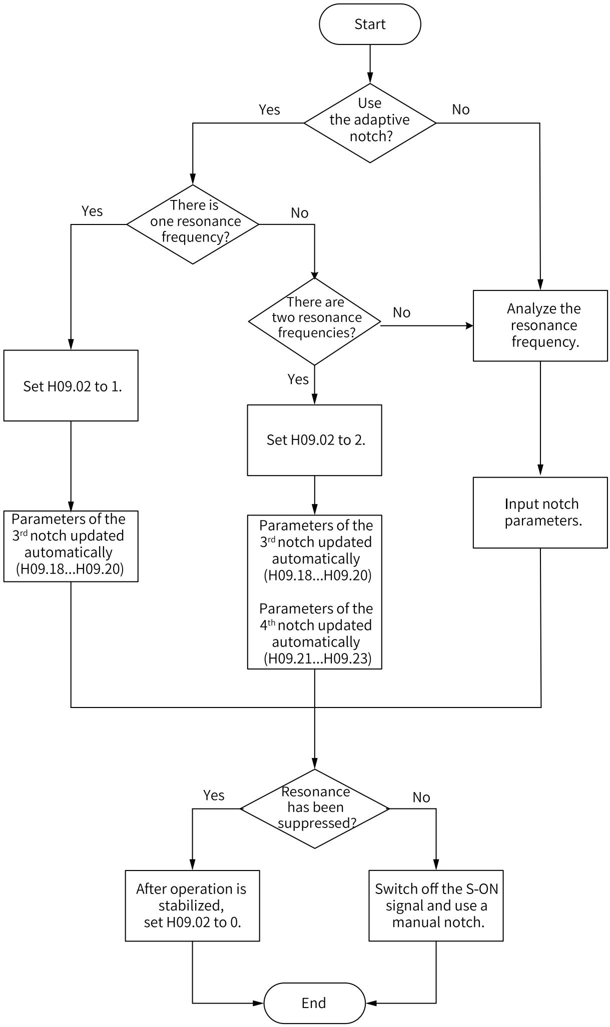


Figure 3-15 Procedure for setting the notch

- Procedure for setting the adaptive notch:

1. Set H09.02 (Adaptive notch mode selection) to 1 or 2 based on the number of resonance frequencies.
2. When resonance occurs, set H09.02 to 1 first to enable one adaptive notch. If new resonance occurs after gain adjustment, set H09.02 to 2 to enable two adaptive notches.
3. When the servo drive runs, parameters of the 3rd or 4th notch are automatically updated and their values are written to the corresponding H09 group parameters every 30 minutes.
4. If resonance is suppressed, the adaptive notch works. After the servo drive runs stably for a period of time, set H09.02 to 0 and the parameters of the adaptive notch are fixed to the last updated values.

   This is to prevent notch parameters from being updated to wrong values due to misoperation. Wrong values will intensity resonance.
5. If resonance persists after the notch is working for a period of time, switch off the S-ON signal.
6. If there are more than two resonance frequencies, the problem cannot be solved by only using the adaptive notches. In this case, add a manual notch, Additionally use the manual notch, or use all the four notches as manual ones (H09.02 = 0).

Note

- When the adaptive notch is used, if the S-ON signal is switched off within 30 min, the notch parameters will not be saved to the corresponding parameters.
- When the resonance frequency is below 300 Hz, the suppression effect of the adaptive notch may be degraded.

- Procedure for setting the manual notch:

  1. Analyze the resonance frequency.
  2. When using the manual notch, set the notch frequency to same value as the actual resonance frequency obtained in the following ways: The resonance frequency can be obtained by using the following methods:
     - Use the "Mechanical characteristic analysis" function in Inovance software tool.
     - Calculate the resonance frequency based on the motor phase current displayed on the oscilloscope interface of the software tool.
     - Set H09.02 to 3 so that the servo drive automatically detects the resonance frequency during running and saves the detection result to H09.24.
  3. Input the resonance frequency obtained in step 1 to the parameter of the selected notch, and input the width level and depth level of this notch.

4. If resonance has been suppressed, it indicates the notch functions well and you can continue adjusting the gain. If resonance occurs again, repeat steps 1 and 2.
5. If resonance persists after the notch is working for a period of time, switch off the S-ON signal.

- Width level of the notch
  The width level indicates the ratio of the notch width to the center frequency of the notch.

$$\text{Notch width level} = \frac{f_H - f_L}{f_T}$$

Steps:

f_T: center frequency of the notch, which is also the mechanical resonance frequency

$f_H - f_L$ is the notch width, that is, the frequency bandwidth with an amplitude attenuation rate of –3 dB relative to the notch central frequency.

The following figure shows the correspondence. Use the default value 2 in normal cases.

- Depth level of the notch
  The notch depth level indicates the ratio of the input to the output at the center frequency.

  When the depth level is 0, the input is completely suppressed at the center frequency. When the depth level is 100, the input can be fully passed at the center frequency. Therefore, the lower the depth level is, the higher the notch depth is, and the stronger the suppression effect will be. Note that an excessively low depth level may lead to system oscillation.

Note

If the amplitude-frequency characteristic curve obtained through the mechanical characteristic analysis tool does not have obvious spikes but vibration does occur in actual operations, the gain limit of the servo drive may be reached, which leads to the vibration. Such vibration, which is not a mechanical resonance that normally suppressed by a notch, can be suppressed only by reducing the gains or the torque reference filter time.

The following figure shows the frequency characteristics of the notch.

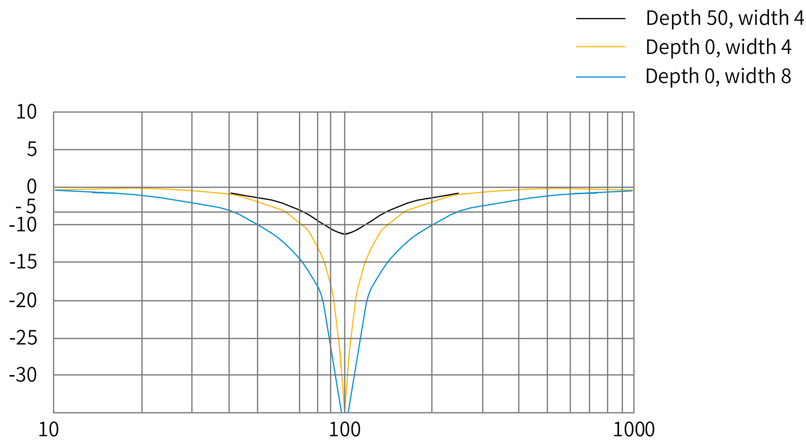


Figure 3-16 Notch frequency characteristics

☆ Related parameters:

See *" H09.02" on page 234* for details.

See *" H09.12" on page 237* for details.

See *" H09.13" on page 237* for details.

See *" H09.14" on page 237* for details.

See *" H09.15" on page 238* for details.

See *" H09.16" on page 238* for details.

See *" H09.17" on page 238* for details.

See *" H09.18" on page 238* for details.

See *" H09.19" on page 239* for details.

See *" H09.20" on page 239* for details.

See *" H09.21" on page 239* for details.

See *" H09.22" on page 239* for details.

See *" H09.23" on page 240* for details.

See *" H09.24" on page 240* for details.

3.6.2 Low-Frequency Resonance Suppression at the Mechanical End

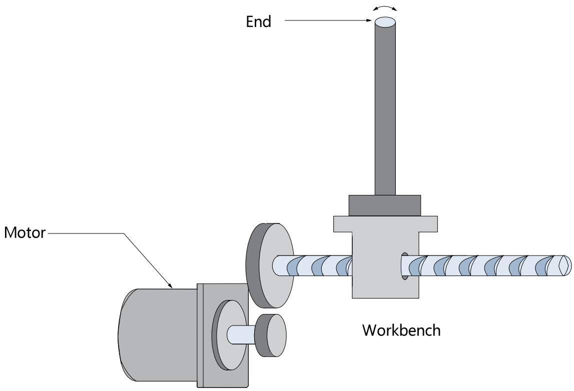


Figure 3-17 Low-frequency vibration at the mechanical end

If the mechanical load end is long and heavy, vibration may easily occur in this part during emergency stop, affecting the positioning effect. Such vibration is called low-frequency resonance as its frequency is generally within 100 Hz, which is lower than the mechanical resonance frequency mentioned in *"3.6.1 Mechanical Resonance Suppression" on page 128*. Use the low-frequency resonance suppression function to reduce such vibration.

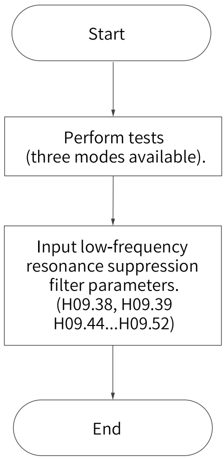


Figure 3-18 Procedure for setting low-frequency resonance suppression filter

First, use the oscilloscope function in the software tool to collect the position deviation waveform of the motor in the positioning state. Then calculate the position deviation fluctuation frequency, which is the low-frequency resonance frequency. Finally, input the value of H09.38 manually and use the default value of H09.39.

Observe the resonance suppression effect after using the low-frequency resonance suppression filter.

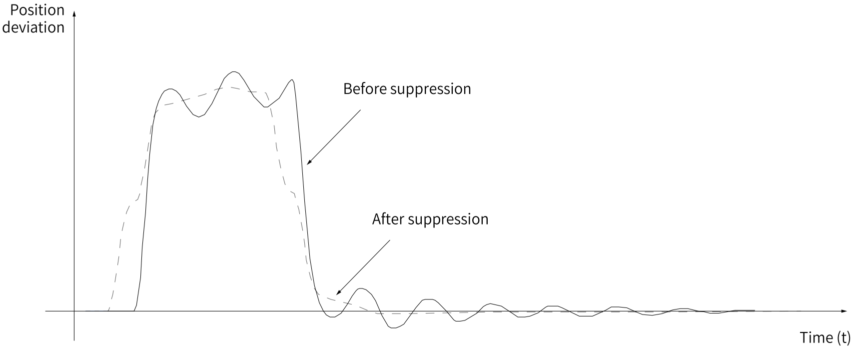


Figure 3-19 Low-frequency resonance suppression effect

☆ Related parameters:

See *" H09.38" on page 243* for details.

See *" H09.39" on page 243* for details.

See *" H09.44" on page 244* for details.

See *" H09.45" on page 244* for details.

See *" H09.47" on page 244* for details.

See *" H09.49" on page 244* for details.

See *" H09.50" on page 245* for details.

See *" H09.52" on page 245* for details.

3.7 Mechanical Characteristic Analysis

Overview

Mechanical characteristic analysis is used to determine the mechanical resonance point and system bandwidth. Up to 8 kHz response characteristic analysis is available and three modes including mechanical characteristics, speed open loop, and speed closed loop are supported.

Operating Procedure

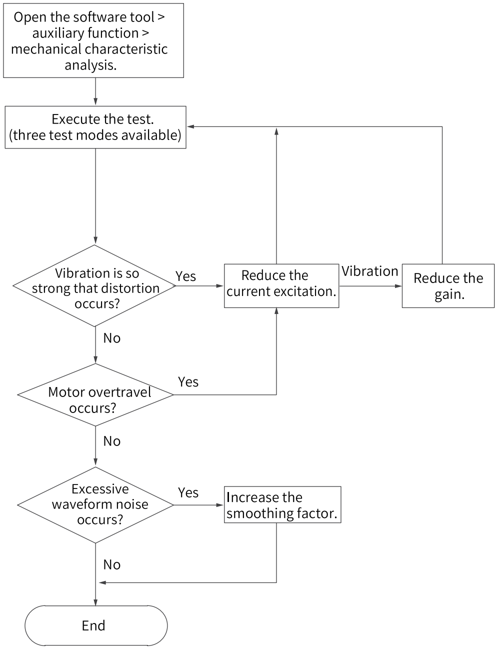


Figure 3-20 Operating procedure for mechanical characteristic analysis

Note

- To avoid strong vibration during testing, set the initial current excitation to 10%.
- The analysis waveform may be distorted if the current excitation is excessively small.
- If vibration generated during testing cannot be suppressed by reducing the current excitation, the causes and solutions may be:
  1. The gain values are too high. In this case, reduce the speed gain or set notch parameters based on the auto-tuned resonance point.
  2. The set inertia ratio is excessively high. In this case, reset the inertia ratio to a proper value.
- In the mechanical characteristic test mode, waveforms before and after notch settings are consistent. In the speed closed loop and speed open loop modes, gain curves in the waveforms are attenuated after notch settings.

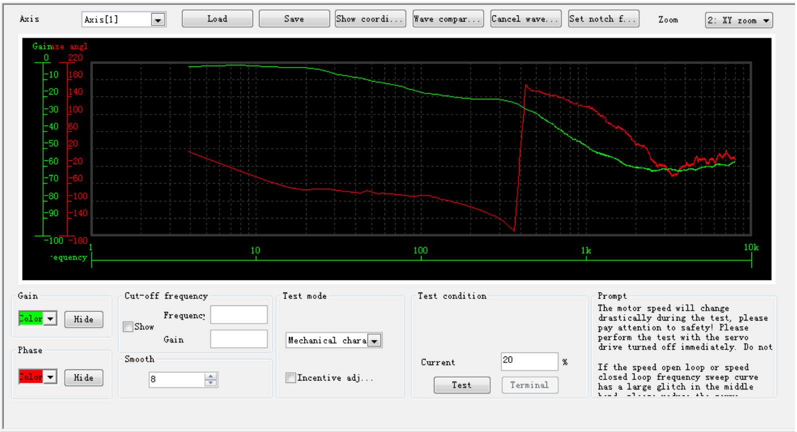


Figure 3-21 Example of the waveform obtained

An example of the waveform obtained with the mechanical characteristic analysis is shown in *"Figure 3–21 Example of the waveform obtained" on page 137*.

4 Description of Parameters

4.1 H00 Servo Motor Parameters

H00.00 Motor code

Address:	0x0000		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	14101	Change:	At stop

Value Range:

0 to 65535

Description

14000: Inovance motor with 20-bit incremental encoder

14101: Inovance motor with 23-bit absolute encoder

14102: Inovance motor with 26-bit absolute encoder

H00.02 Customized No.

Address:	0x0000		
Min.:	0	Unit:	-
Max.:	2^{32} - 1	Data type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0.00 to 2^{32} - 1.00

Description

Used to differentiate the customized MCU software version, which is not applicable to standard models.

H00.04 Encoder version

Address:	0x0004		
Min.:	0	Unit:	-
Max.:	6553.5	Data type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Saved in the encoder and used to differentiate the encoder software version

H00.05 Serial-type motor code

Address:	0x0005		
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16

Default: 0 Change: Unchangeable

Value Range:

0 to 65535

Description

Displays the code of the serial-type motor, which is determined by the motor model and changeable.

H00.06 Customized FPGA No.

Address: 0x0006

Min.: 0 Unit: -

Max.: 655.35 Data type: UInt16

Default: 0 Change: Unchangeable

Value Range:

0.00 to 655.35

Description

Used to differentiate the customized FPGA software version, which is not applicable to standard models.

H00.07 STO version

Address: 0x000

Min.: 0 Unit: -

Max.: 655.35 Data type: UInt16

Default: 0 Change: Unchangeable

Value Range:

0.00 to 655.35

Description

Displays the software version of the STO function.

H00.08 Serial encoder type

Address: 0x0008

Min.: 0 Unit: -

Max.: 65535 Data type: UInt16

Default: 0 Change: At stop

Value Range:

0 to 65535

Description

14100: Multi-turn absolute encoder

Others: Single-turn absolute encoder

4.2 H01 Servo Drive Parameters

H01.00 MCU software version

Address:	0x0100		
Min.:	0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Displays the MCU software version (with one decimal place).

H01.01 FPGA software version

Address:	0x0101		
Min.:	0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Displays the FPGA software version (with one decimal place).

H01.02 Servo drive series No.

Address:	0x0102		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the servo drive series No. (without decimal place).

H01.06 Board software version

Address:	0x0106		
Min.:	0	Unit:	-
Max.:	6554	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Setpoint

0.0 to 6554

Description

Displays the board software version (with one decimal place).

H01.10 Drive series No.

Address:	0x010A		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	3	Change:	At stop

Value Range:

2: S1R6

3: S2R8

5: S5R5

60005: S6R6

6: S7R6

7: S012

8: S018

9: S022

10: S027

10001: T3R5

10002: T5R4

10003: T8R4

10004: T012

10005: T017

10006: T021

10007: T026

Description

Displays the drive series No. (without decimal place).

H01.11 DC-AC voltage class

Address:	0x010B		
Min.:	0	Unit:	V
Max.:	65535	Data Type:	UInt16
Default:	220	Change:	Unchangeable

Value Range:

0 V to 65535 V

Description

Displays DC-AC voltage class (without decimal place).

H01.12 Rated power of the drive

Address:	0x010C		
Min.:	0	Unit:	kW
Max.:	10737418.24	Data Type:	UInt32
Default:	0.4	Change:	Unchangeable

Value Range:

0.00 to 10737418.24

Description

Displays the rated power of the servo drive (with two decimal places).

H01.14 Max. output power of the drive

Address: 0x010E

Min.:	0	Unit:	kW
Max.:	10737418.24	Data Type:	UInt32
Default:	0.4	Change:	Unchangeable

Value Range:

0.00 to 10737418.24

Description

Displays the maximum output power of the drive (with two decimal places).

H01.16 Rated output current of the drive

Address: 0x0110

Min.:	0	Unit:	A
Max.:	10737418.24	Data Type:	UInt32
Default:	2.8	Change:	Unchangeable

Value Range:

0.00 to 10737418.24

Description

Displays the rated output current of the drive (with two decimal places).

H01.18 Max. output current of the drive

Address: 0x0112

Min.:	0	Unit:	A
Max.:	10737418.24	Data Type:	UInt32
Default:	10.1	Change:	Unchangeable

Value Range:

0.00 to 10737418.24

Description

Displays the maximum output current of the drive (with two decimal places).

H01.40 DC bus overvoltage protection threshold

Address: 0x0128

Min.:	0	Unit:	V
Max.:	2000	Data Type:	UInt16
Default:	420	Change:	At once

Value Range:

0 to 2000

Description

Displays DC bus overvoltage protection threshold (without decimal place).

H01.75 Current loop amplification factor

Address:	0x014B		
Min.:	0	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0.00 to 655.35

Description

Displays current loop amplication coefficient (with two decimal places).

H01.89 Junction temperature parameter version

Address:	0x0159		
Min.:	0	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65.535

Description

Displays the junction temperature parameter version.

4.3 H02 Basic Control Parameters

H02.00 Control mode

Address:	0x0200		
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Speed control mode
1: Position control mode
2: Torque control mode
3: Torque/Speed control mode
4: Speed/Position control mode
5: Torque/Position control mode
6: Torque/Speed/Position compound mode
7: Process segment

Description

0: Speed control mode

1: Position control mode

2: Torque control mode

3: Torque/Speed control mode

4: Speed/Position control mode

5: Torque/Position control mode

6: Torque/Speed/Position compound mode

7: Process segment

H02.01 Absolute system selection

Address: 0x0201

Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Incremental mode

1: Absolute position linear mode 2: Absolute position rotation mode

3: Absolute position linear mode (without encoder overflow warning)

4: Absolute position single-turn mode

Description

Used to set the absolute position function.

H02.02 Direction of rotation

Address: 0x0202

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

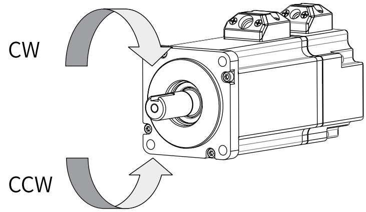
0: Counterclockwise (CCW) as forward direction

1: Clockwise (CW) as forward direction

Description

Defines the forward direction of the motor when viewed from the motor shaft side.

Setpoint	Direction of rotation	Remarks
0	CCW direction as forward direction	When a forward command is input, the motor rotates in CCW direction viewed from the motor shaft side, that is, the motor rotates counterclockwise.
1	CW direction as forward direction	When a forward command is input, the motor rotates in CW direction viewed from the motor shaft side, that is, the motor rotates clockwise.



H02.03 Output pulse phase

Address: 0x0203

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At stop

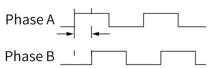
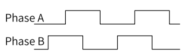
Value Range:

0: Phase A leads phase B

1: Phase A lags behind phase B

Description

Defines the relationship between phase A and phase B on the condition that the motor direction of rotation remains unchanged when pulse output is enabled.

Setpoint	Output pulse phase	Remarks
0	Phase A leads phase B.	Phase A leads phase B by 90° in encoder frequency-division output pulses. 
1	Phase A lags phase B.	Phase A lags behind phase B by 90° in encoder frequency-division output pulses. 

H02.05 Stop mode at S-ON OFF

Address:	0x0205		
Min.:	-4	Unit:	-
Max.:	2	Data Type:	Int16
Default:	0	Change:	Real-time modification

Value Range:

-4: Stop based on ramp 2, keeping dynamic braking state
-3: Stop at zero speed, keeping dynamic braking state
-2: Stop based on ramp 1, keeping dynamic braking state
-1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Stop based on ramp 1, keeping de-energized state
2: Dynamic braking stop, keeping de-energized state

Description

Defines the deceleration mode of the motor for stopping rotating upon S-ON OFF and the motor status after stop.

H02.06 Stop mode at No.2 fault

Address:	0x0206		
Min.:	-5	Unit:	-
Max.:	4	Data Type:	Int16
Default:	2	Change:	Real-time modification

Value Range:

-5: Stop at zero speed, keeping dynamic braking state
-4: Stop at emergency stop torque, keeping dynamic braking state
-3: Stop based on ramp 2, keeping dynamic braking state
-2: Stop based on ramp 1, keeping dynamic braking state
-1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Stop based on ramp 1, keeping de-energized state
2: Stop based on ramp 2, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

Description

Defines the deceleration mode of the servo motor for stopping rotating and the servo motor status when a No. 2 fault occurs.

H02.07 Stop mode at overtravel

Address:	0x0207		
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Coast to stop, keeping de-energized state
1: Stop at zero speed, keeping position lock state
2: Stop at zero speed, keeping de-energized state
3: Stop based on ramp 2, keeping de-energized state
4: Stop based on ramp 2, keeping position lock state
5: Dynamic braking stop, keeping de-energized state
6: Dynamic braking stop, keeping dynamic braking state
7: Not responding to overtravel

Description

Defines the deceleration mode of the servo motor for stopping rotating and the servo motor status when overtravel occurs.

H02.08 Stop mode at No.1 fault

Address:	0x0208		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0: Coast to stop, keeping de-energized state
1: Dynamic braking stop, keeping de-energized state
2: Dynamic braking stop, keeping dynamic braking state

Description

Defines the deceleration mode of the servo motor for stopping rotating and the servo motor status when a No. 1 fault occurs.

For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

H02.09 Delay from brake output ON to command received

Address:	0x0209		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	250	Change:	Real-time modification

Value Range:

0 ms to 500 ms

Description

Defines the delay from the moment the brake output signal is ON to the moment the servo drive starts to receive commands after power-on.

For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

H02.10 Delay from brake output off to motor de-energized

Address: 0x020A

Min.:	50	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	150	Change:	Real-time modification

Value Range:

50 ms to 1000 ms

Description

Defines the delay from the moment brake output is OFF to the moment when the motor at standstill enters the de-energized status.

For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

H02.11 Motor speed threshold at brake output OFF in rotation state

Address: 0x020B

Min.:	20	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	30	Change:	Real-time modification

Value Range:

20 rpm to 3000 rpm

Description

Defines the motor speed threshold when brake (BK) output is OFF in the rotating state.

For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

H02.12 Delay from S-ON OFF to brake output OFF in rotation state

Address: 0x020C

Min.:	1	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Real-time modification

Value Range:

1 ms to 65535 ms

Description

Sets the delay time from BK OFF to S-ON OFF when the motor is in rotating state.

H02.15 Warning display on the keypad

Address: 0x020F

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Output warning information immediately

1: Not output warning information

Description

Defines whether to switch the keypad to the fault display mode when a No. 3 fault occurs.

H02.17 Stop mode upon main circuit power failure

Address:	0x0211		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0: Keep present action

1: Stop upon fault as defined by H02.06

2: Stop at S-ON OFF as defined by H02.05

3: Stop quickly as defined by H02.18

Description

Defines the stop mode of the motor for stopping rotating upon main circuit power failure.

H02.18 Quick stop mode

Address:	0x0212		
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0: Coast to stop, keeping de-energized state

1: Stop based on ramp 1, keeping de-energized state

2: Stop based on ramp 2, keeping de-energized state

3: Stop at emergency stop torque, keeping de-energized state

5: Stop based on ramp 1, keeping position lock state

6: Stop based on ramp 2, keeping position lock state

7: Stop at emergency stop torque, keeping position lock state

Description

Defines the deceleration mode of the motor for stopping rotating upon quick stop and the motor status after stop.

H02.21 Permissible minimum resistance of regenerative resistor

Address:	0x0215		
Min.:	1	Unit:	Ω
Max.:	1000	Data Type:	UInt16

Default:	40	Change:	Unchangeable

Value Range:

1 Ω to 1000 Ω

Description

-

H02.22 Power of built-in regenerative resistor

Address:	0x0216		
Min.:	0	Unit:	W
Max.:	65535	Data type:	UInt16
Default:	50	Change:	Unchangeable

Value Range:

0 W to 65535 W

Description

The power of the built-in regenerative resistor is only related to the servo drive model, which is unmodifiable.

H02.23 Resistance of built-in regenerative resistor

Address:	0x0217		
Min.:	0	Unit:	Ω
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Unchangeable

Value Range:

0 Ω to 65535 Ω

Description

The resistance of the built-in regenerative resistor is only related to the servo drive model, which is unmodifiable.

Table 4–1 Specifications of the regenerative resistor

Servo Drive Model	Specifications of Built-in Regenerative Resistor		External regenerative resistor Min. Allowable Resistance (Ω) (H02.21)
	Resistance (Ω)	Power (Pr) (W)	
SV670PS1R6I	-	-	40
SV670PS2R8I	-	-	
SV670PS5R5I	50	50	
SV670PS7R6I	25	80	20
SV670PS012I			15
SV670PS018I	20	100	20
SV670PS022I			
SV670PS027I			
SV670PT3R5I	100	80	80
SV670PT5R4I			60
SV670PT8R4I	50		45
SV670PT012I			40
SV670PT017I	35	100	25
SV670PT021I			
SV670PT026I			

H02.24 Resistor heat dissipation coefficient

Address: 0x0218

Min.: 10 Unit: %

Max.: 100 Data Type: UInt16

Default: 30 Change: Real-time modification

Value Range:

10% to 100%

Description

Defines the heat dissipation coefficient of the regenerative resistor, which is applicable to both external and built-in regenerative resistors.

Defines the heat dissipation coefficient of the regenerative resistor, which is applicable to both external and built-in regenerative resistors.

Set this parameter properly according to actual heat dissipation conditions of the resistor.

Recommendations:

Generally, the value of H02.24 cannot exceed 30% for natural cooling.
The value of H02.24 cannot exceed 50% for forced air cooling.

H02.25 Regenerative resistor type

Address:	0x0219		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	3	Change:	Real-time modification

Value Range:

0: Built-in

1: External, natural cooling 2: External, forced air cooling 3: No resistor needed

Description

Defines the resistor type and the mode of absorbing and releasing the braking energy.

H02.26 Power of external regenerative resistor

Address:	0x021A		
Min.:	1	Unit:	W
Max.:	65535	Data Type:	UInt16
Default:	40	Change:	Real-time modification

Value Range:

1 W–65535 W

Description

Defines the power of external regenerative resistor.

H02.27 Resistance of external regenerative resistor

Address:	0x021B		
Min.:	15	Unit:	Ω
Max.:	1000	Data Type:	UInt16
Default:	50	Change:	Real-time modification

Value Range:

15 Ω to 1000 Ω

Description

Defines the resistance of the external regenerative resistor.

H02.30 User password

Address:	0x021E		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

-

H02.31 System parameter initialization

Address: 0x021F

Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Restore default settings

2: Clear fault records

Description

Used to restore default values or clear fault records.

H02.32 Selection of parameters in group H0b

Address: 0x0220

Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	50	Change:	At once

Value Range:

0 to 99

Description

Used to set the offset of the parameter to be displayed on the keypad.

For example, the setpoint 0 indicates the value of H0b.00 (Motor speed actual value) is displayed on the keypad.

The setpoint 1 indicates the value of H0b.01 is displayed on the keypad.

H02.35 Keypad data refresh frequency

Address: 0x0223

Min.:	0	Unit:	Hz
Max.:	20	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 20

Description

-

H02.41 Manufacturer password

Address: 0x0229

Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt16
Change: At once

Value Range:

0 to 65535

Description

-

4.4 H03 Terminal Input Parameters

H03.00 DI function allocation 1 (activated upon power-on)

Address: 0x0300
Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt16
Change: Real-time modification

Value Range:

0: Corresponding to null
1: Corresponding to FunIN.1
2: Corresponding to FunIN.2
4: Corresponding to FunIN.3
8: Corresponding to FunIN.4
16: Corresponding to FunIN.5
32: Corresponding to FunIN.6
64: Corresponding to FunIN.7
128: Corresponding to FunIN.8
256: Corresponding to FunIN.9
512: Corresponding to FunIN.10
1024: Corresponding to FunIN.11
2048: Corresponding to FunIN.12
4096: Corresponding to FunIN.13
8192: Corresponding to FunIN.14
16384: Corresponding to FunIN.15
32768: Corresponding to FunIN.16

Description

Used to enable a certain DI function (FunIN.1 to FunIN.16) to be activated immediately at next power-on.

H03.01 DI function allocation 2 (activated upon power-on)

Address: 0x0301
Min.: 0
Unit: -

Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Corresponding to null
1: Corresponding to FunIN.17
2: Corresponding to FunIN.18
4: Corresponding to FunIN.19
8: Corresponding to FunIN.20
16: Corresponding to FunIN.21
32: Corresponding to FunIN.22
64: Corresponding to FunIN.23
128: Corresponding to FunIN.24
256: Corresponding to FunIN.25
512: Corresponding to FunIN.26
1024: Corresponding to FunIN.27
2048: Corresponding to FunIN.28
4096: Corresponding to FunIN.29
16384: Corresponding to FunIN.31
32768: Corresponding to FunIN.32

Description

Used to enable a certain DI function (FunIN.17 to FunIN.32) to be activated immediately at next power-on.

H03.02 DI1 function

Address: 0x0302

Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	14	Change:	At once

Value Range:

0: No assignment
1: S-ON
2: Warning reset signal
3: Gain switchover switch
4: Switchover between main and auxiliary commands
5: Multi-reference direction
6: Multi-reference switchover CMD1
7: Multi-reference switchover CMD2
8: Multi-reference switchover CMD3
9: Multi-reference switchover CMD4
10: Mode switchover M1-SEL

11: Mode switchover M2-SEL
12: Zero clamp enable signal
13: Position reference inhibited
14: Positive limit switch
15: Reverse limit switch
16: Positive external torque limit
17: Negative external torque limit
18: Forward jog
19: Reverse jog
20: Step enable
21: Hand wheel override signal 1
22: Hand wheel override signal 2
23: Hand wheel enable signal
24: Electronic gear ratio selection
25: Torque reference direction
26: Speed reference direction
27: Position reference direction
28: Multi-position reference enable
29: Interrupt positioning cancelled
31: Home switch
32: Homing enable
33: Interrupt positioning inhibited
34: Emergency stop
35: Clear position deviation
36: Internal speed limit source
37: Pulse reference inhibited
38: Touch probe 1
39: Touch probe 2
41: Current position as home
42: Axis control command executed immediately
43: Axis control command not exected immediately
44: Positioning and command completed signal clear
45: Interrupt positioning enable
46: Process segment enable
47: Process segment command switchover 1
48: Process segment command switchover 2
49: Process segment command switchover 3
50: Process segment command switchover 4

51: Event trigger process segment 1
52: Event trigger process segment 2
53: Event trigger process segment 3
54: Event trigger process segment 4
55: Process segment pause

Description

Defines the function of DI1.

H03.03 DI1 logic

Address: 0x0303

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open
1: Closed

Description

Used to set the level logic of DI1 when the function assigned to DI1 is active.

H03.04 DI2 function selection

Address: 0x0304

Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	15	Change:	Real-time modification

Value Range:

See *" H03.02" on page 155* for details.

Description

Defines the function of DI2.

H03.05 DI2 logic

Address: 0x0305

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open
1: Closed

Description

-

H03.06 DI3 function selection

Address: 0x0306

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 13 | Change: Real-time modification

Value Range:

See " H03.02" on page 155 for details.

Description

Defines the function of DI3.

H03.07 DI3 logic

Address: 0x0307

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Normally open

1: Closed

Description

-

H03.08 DI4 function selection

Address: 0x0308

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 2 | Change: Real-time modification

Value Range:

See " H03.02" on page 155 for details.

Description

Defines the function of DI4.

H03.09 DI4 logic

Address: 0x0309

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Normally open

1: Closed

Description

-

H03.10 DI5 function selection

Address: 0x030A

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 1 | Change: Real-time modification

Value Range:

See *" H03.02" on page 155* for details.

Description

Defines the function of DI5.

H03.11 DI5 logic

Address: 0x030B

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Normally open

1: Closed

Description

-

H03.13 DI6 logic

Address: 0x030D

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Normally open

1: Closed

Description

-

H03.12 DI6 function selection

Address: 0x030C

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 0 | Change: Real-time modification

Value Range:

See *" H03.02" on page 155* for details.

Description

Defines the function of DI6.

H03.14 DI7 function selection

Address: 0x030E

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 45 | Change: Real-time modification

Value Range:

See *" H03.02" on page 155* for details.

Description

Defines the function of DI7.

H03.15 DI7 logic

Address: 0x030F

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Normally open

1: Closed

Description

-

H03.16 D8 function selection

Address: 0x0310

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 31 | Change: Real-time modification

Value Range:

See *" H03.02" on page 155* for details.

Description

Defines the function of DI8.

H03.17 DI8 logic

Address: 0x0311

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Normally open

1: Closed

Description

-

H03.34 DI function allocation 3 (activated upon power-on)

Address: 0x0322

Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

Value Range:

0: Corresponding to null
1: Corresponding to FunIN.33
2: Corresponding to FunIN.34
4: Corresponding to FunIN.35
8: Corresponding to FunIN.36
16: Corresponding to FunIN.37
32: Corresponding to FunIN.38
64: Corresponding to FunIN.39
128: Corresponding to FunIN.40
256: Corresponding to FunIN.41
512: Corresponding to FunIN.42
1024: Corresponding to FunIN.43
2048: Corresponding to FunIN.44
4096: Corresponding to FunIN.45
8192: Corresponding to FunIN.46
16384: Corresponding to FunIN.47
32768: Corresponding to FunIN.48

Description

Used to enable a certain DI function (FunIN.33 to FunIN.37) to be activated immediately at next power-on.

H03.35 DI function allocation 4 (activated upon power-on)

Address: 0x0323
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

Value Range:

0: Corresponding to null
1: Corresponding to FunIN.49
2: Corresponding to FunIN.50
4: Corresponding to FunIN.51
8: Corresponding to FunIN.52
16: Corresponding to FunIN.53
32: Corresponding to FunIN.54
64: Corresponding to FunIN.55
128: Corresponding to FunIN.56
256: Corresponding to FunIN.57
512: Corresponding to FunIN.58
1024: Corresponding to FunIN.59
2048: Corresponding to FunIN.60
4096: Corresponding to FunIN.61
8192: Corresponding to FunIN.62
16384: Corresponding to FunIN.63

Description

Used to enable a certain DI function (FunIN.49 to FunIN.64) to be activated immediately at next power-on.

H03.50 Voltage-type AI1 offset

Address:	0x0332		
Min.:	-5000	Unit:	mV
Max.:	5000	Data Type:	Int16
Default:	0	Change:	At once

Value Range:

-5000 to +5000

Description

Defines the actual AI1 input voltage when the drive sampling voltage is 0 after zero drift correction.

H03.51 Voltage-type AI1 input filter time constant

Address:	0x0333		
Min.:	0	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0.00 ms to 655.35 ms

Description

Defines the filter time constant of AI1 input current signal.

H03.53 Voltage-type AI1 dead zone

Address: 0x0335

Min.:	0	Unit:	mV
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0.0 to 1000.0

Description

Defines the AI1 input voltage range when the drive sampling voltage is 0.

H03.54 Voltage-type AI1 zero drift

Address: 0x0336

Min.:	-500	Unit:	mV
Max.:	500	Data Type:	Int16
Default:	0	Change:	At once

Value Range:

-500.0 to +500.0

Description

Zero drift indicates the value of the drive sampling voltage relative to GND upon zero AI voltage.

Set H0d.10 (Automatic adjustment of analog channels) to 1 (AI1 adjustment) to perform automatic adjustment on AI1 zero drift. The AI1 zero drift adjusted will be saved into H03.54.

H03.60 DI1 filter time

Address: 0x033C

Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI1. The DI function is active only after the effective level is kept within the time defined by H03.60.

H03.61 DI2 filter time

Address: 0x033D

Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI2. The DI function is active only after the effective level is kept within the time defined by H03.61.

H03.62 DI3 filter time

Address:	0x033E		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI3. The DI function is active only after the effective level is kept within the time defined by H03.62.

H03.63 DI4 filter time

Address:	0x033F		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI4. The DI function is active only after the effective level is kept within the time defined by H03.63.

H03.64 DI5 filter time

Address:	0x0340		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI5. The DI function is active only after the effective level is kept within the time defined by H03.64.

H03.65 DI6 filter time

Address:	0x0341		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16

Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI6. The DI function is active only after the effective level is kept within the time defined by H03.65.

H03.66 DI7 filter time

Address:	0x0342		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	0.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI7. The DI function is active only after the effective level is kept within the time defined by H03.66.

H03.67 DI8 filter time

Address:	0x0343		
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	3.00	Change:	Real-time modification

Value Range:

0.00 ms to 500.00 ms

Description

Defines the filter time of DI8. The DI function is active only after the effective level is kept within the time defined by H03.67.

H03.80 Speed corresponding to analog 10 V

Address:	0x0350		
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	At stop

Value Range:

0 rpm to 10000 rpm

Description

Defines the corresponding motor speed when the sampling voltage is 10 V.

Speed reference value = Sampling voltage/10 x H03.80

H03.81 Torque corresponding to analog 10 V

Address: 0x0351

Min.:	1	Unit:	Multiplier
Max.:	8	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 8

Description

Defines the motor torque corresponding to a sampling voltage of 10 V.

Torque reference value = Sampling voltage/10 x H03.81

4.5 H04 Terminal Output Parameters

H04.00 DO1 function selection

Address: 0x0400

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

0: No function
1: Servo ready
2: Motor rotation signal
3: Zero speed signal
4: Speed matching signal
5: Positioning completed
6: Positioning near
7: Torque limited signal
8: Speed limited signal
9: Braking
10: Warning
11: Fault
15: Interrupt positioning completed
16: Home found
17: Electrical homing completed
18: Torque reached signal
19: Speed reached signal
21: Enable completed
22: Internal command completed
23: Writing next command allowed

24: Internal motion completed
25: Comparison output
26: Closed loop state
30: Warning or fault output
31: Communication-forced DO
32: EDM output

Description

Defines the function of DO1.

H04.01 DO1 logic

Address:	0x0401		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open
1: Closed

Description

Defines the level logic of DO1 when the function assigned to DO1 is active.

H04.02 DO2 function selection

Address:	0x0402		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	9	Change:	Real-time modification

Value Range:

See *" H04.00" on page 166* for details.

Description

-

H04.03 DO2 logic

Address:	0x0403		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open
1: Closed

Description

-

H04.04 DO3 function selection

Address: 0x0404

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H04.00" on page 166* for details.

Description

-

H04.05 DO3 logic

Address: 0x0405

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open

1: Closed

Description

-

H04.06 DO4 function selection

Address: 0x0406

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	11	Change:	Real-time modification

Value Range:

See *" H04.00" on page 166* for details.

Description

-

H04.07 DO4 logic

Address: 0x0407

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open

1: Closed

Description

-

H04.08 DO5 function selection

Address: 0x0408

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	16	Change:	Real-time modification

Value Range:

See " H04.00" on page 166 for details.

Description

-

H04.09 DO5 logic

Address: 0x0409

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Normally open

1: Closed

Description

-

H04.22 DO source selection

Address: 0x0416

Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

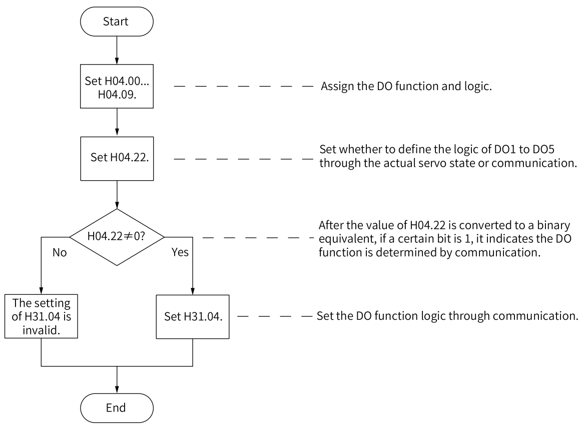
bit	Name	Function
0	DO1	0: DO1 function output
		1: Bit 0 of H31.04 set through communication
1	DO2	0: DO2 function output
		1: Bit 1 of H31.04 set through communication
2	DO3	0: DO3 function output
		1: Bit 2 of H31.04 set through communication
3	DO4	0: DO4 function output
		1: Bit 3 of H31.04 set through communication
4	DO5	0: DO5 function output
		1: Bit 4 of H31.04 set through communication

Description

Defines whether the logic of a physical DO terminal is defined by the actual state of the drive or by communication.
The value of H04.22 is displayed in decimal on the keypad. When the value is converted to a binary equivalent: If bit(n) is 0, it indicates the logic of DO(n+1) is defined by the actual state of the drive. If bit(n) is 1, it indicates the logic of DO(n+1) is defined by communication (H31.04).

Setpoint (decimal)	Setpoint (binary)					DO logic	
	bit4	bit3	bit2	bit1	bit0	Defined by the Drive State	Defined by Communica tion (H31.04)
	DO5	DO4	DO3	DO2	DO1		
0	0	0	0	0	0	DO1 to DO5	/
1	0	0	0	0	1	DO2 to DO5	DO1
…	…	…	…	…	…	…	…
31	1	1	1	1	1	/	DO1 to DO5

Set H04.22 to a value listed in the preceding table.
H31.04 is not displayed on the keypad and can only be modified through communication. For H31.04, "bit(n) = 1" indicates the logic of DO(n+1) is active. "bit(n) = 0" indicates the logic of DO(n+1) is inactive.



H04.23 Communication-forced DO logic in non-OP status

Address:	0x0417		
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

bit	Name	Function
0	DO1	0: Status unchanged
		1: No output
1	DO2	0: Status unchanged
		1: No output
2	DO3	0: Status unchanged
		1: No output
3	DO4	0: Status unchanged
		1: No output
4	DO5	0: Status unchanged
		1: No output

Description

-

H04.50 AO1 signal selection

Address: 0x0432
Min.: 0 Unit: -
Max.: 10 Data Type: UInt16
Default: 0 Change: At once

Value Range:

0: Motor speed (1 V/1000 rpm)
1: Speed reference(1 V/1000 rpm)
2: Torque reference (1 V/100 x rated torque)
3: Position deviation (0.5 mV/1 reference unit)
4: Position deviation (0.5 mV/1 encoder unit)
5: Position reference speed (1 V/1000 rpm)
6: Positioning completed
8: AI1 voltage
10: Defined by H31.05

Description

Defines the physical value source of AO1.

H04.51 AO1 offset voltage

Address: 0x0433
Min.: -10000 Unit: mV
Max.: 10000 Data Type: Int16
Default: 0 Change: At once

Value Range:

-10000 to +10000

Description

Defines the actual AO1 output voltage after offset when the output voltage is 0 V in theory.

H04.52 AO1 multiplier

Address:	0x0434		
Min.:	-99.99	Unit:	-
Max.:	99.99	Data Type:	Int16
Default:	1	Change:	At once

Value Range:

-99.99 to +99.99

Description

Defines the actual AO1 output voltage after amplification when the output voltage is 1V in theory.

4.6 H05 Position Control Parameters

H05.00 Main position reference source

Address:	0x0500		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Pulse reference

1: Step reference

2: Multi-position reference

Description

Defines the position reference source in position control mode.

H05.01 Position pulse reference input terminal

Address:	0x0501		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Low speed

1: High speed

Description

Used to select the physical input terminal based on the input pulse frequency when the pulse reference acts as the position reference source in the position control mode.

H05.02 Pulses per revolution

Address: 0x0502

Min.:	0	Unit:	PPR
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	At stop

Value Range:

0 PPR to 4294967295 PPR

Description

Defines the number of pulses required per revolution of the motor.

When H05.02 is set to 0, electronic gear ratios 1 and 2 (H05.07 to H05.13) and electronic gear ratio switchover condition (H05.39) are active.

When H05.02 is set to a non-zero value, electronic gear ratio B/A = Encoder resolution/H05.02. In this case, electronic gear ratios 1 and 2 are inactive.

The encoder resolution is 67108864 PPR.

H05.04 First-order low-pass filter time constant

Address: 0x0504

Min.:	0	Unit:	ms
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	At stop

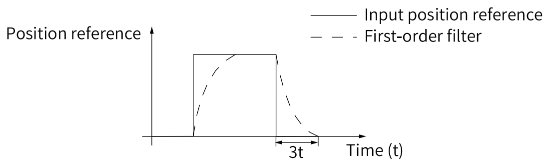
Value Range:

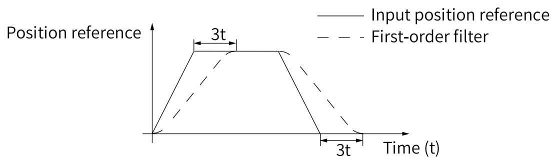
0.0 ms to 6553.5 ms

Description

Defines the first-order low pass filter time constant of position references.

If position reference P is rectangular wave or trapezoidal wave, the position reference after first-order low pass filtering is as follows:





This function does not affect the displacement value (position reference sum). An excessively high setpoint delays the responsiveness, so set a proper filter time constant based on actual conditions.

H05.05 Step reference

Address: 0x0505

Min.:	-9999	Unit:	Reference unit
Max.:	9999	Data Type:	Int16
Default:	50	Change:	At stop

Value Range:

-9999 to +9999

Description

Defines the position reference sum when the step reference acts as the main position reference source.

H05.06 Moving average filter time constant 1

Address: 0x0506

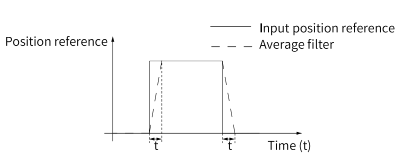
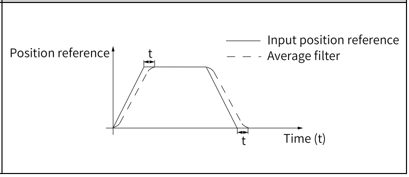
Min.:	0	Unit:	ms
Max.:	128	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0.0 ms to 128.0 ms

Description

Defines the moving average filter time constant of position references. If position reference P is rectangular wave or trapezoidal wave, the position reference after moving average filtering is as follows. This function does not affect the displacement value (position reference sum). An excessively high setpoint delays the responsiveness, so set a proper filter time constant based on actual conditions.

Position reference being rectangular wave	Position reference being trapezoidal wave
	

H05.07 Electronic gear ratio 1 (numerator)

Address: 0x0507

Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	8388608	Change:	Real-time modification

Value Range:

1 to 1073741824

Description

Defines the numerator of electronic gear ratio 1.

H05.09 Electronic gear ratio 1 (denominator)

Address:	0x0509		
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	10000	Change:	Real-time modification

Value Range:

1 to 1073741824

Description

Defines the denominator of electronic gear ratio 1.

H05.11 Electronic gear ratio 2 (numerator)

Address:	0x050B		
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	8388608	Change:	Real-time modification

Value Range:

1 to 1073741824

Description

Defines the numerator of electronic gear ratio 2.

H05.13 Electronic gear ratio 2 (denominator)

Address:	0x050D		
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	10000	Change:	Real-time modification

Value Range:

1 to 1073741824

Description

Defines the denominator of electronic gear ratio 2.

H05.15 Pulse reference form

Address:	0x050F		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

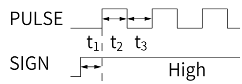
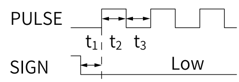
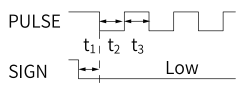
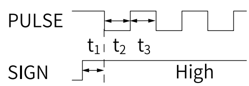
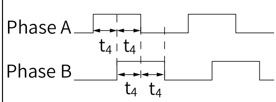
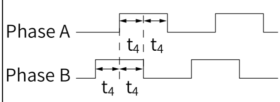
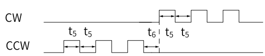
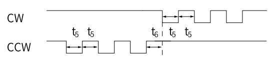
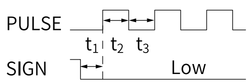
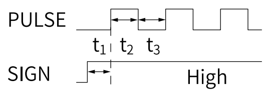
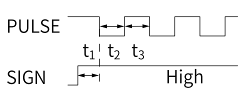
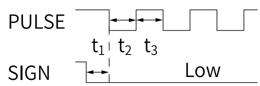
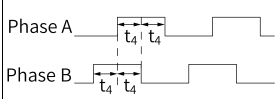
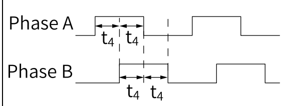
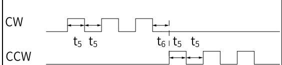
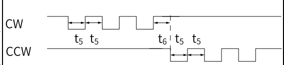
Value Range:

0: Direction + Pulse, positive logic
1: Direction + Pulse, negative logic
2: Phase A + phase B quadrature pulse, quadrupled frequency
3: CW + CCW

Description

Defines the input pulse form when the pulse reference acts as the main position reference source. See details in *"Table 4–2 " on page 176*.

Table 4–2 Descriptions of the pulse form

H02.02	H05.15	Pulse Form	Signal	Diagram of Forward Pulses	Diagram of Reverse Pulses
0	0	Pulse + Direction Positive Logic	PULSE SIGN		
	1	Pulse + Direction Negative Logic	PULSE SIGN		
	2	Phase A + Phase B Quadrature pulse Quadrupled frequency	PULSE (phase A) SIGN (phase B)	Phase A leads phase B by 90°. 	Phase B leads phase A by 90°. 
	3	CW+CCW	PULSE (CW) SIGN (CCW)		
1	0	Pulse + Direction Positive Logic	PULSE SIGN		
	1	Pulse + Direction Negative Logic	PULSE SIGN		
	2	Phase A + Phase B Quadrature pulse Quadrupled frequency	PULSE (phase A) SIGN (phase B)	Phase B leads phase A by 90°. 	Phase A leads phase B by 90°. 
	3	CW+CCW	PULSE (CW) SIGN (CCW)		

Note

The rise time and fall time of position pulse references must be shorter than 0.1 us.

Table 4–3 Specifications of pulse references

Input Terminal	Maximum Frequency	Minimum Time Width (unit: us)					
		t1	t2	t3	t4	t5	t6
High-speed pulse input terminal	8 Mpps	0.125	0.125	0.125	0.25	0.125	0.125
Low-speed pulse input terminal	200 kpps	2.5	2.5	2.5	5	2.5	2.5

H05.16 **Clear action**

Address: 0x0510
Min.: 0 Unit: -
Max.: 2 Data Type: UInt16
Default: 0 Change: At stop

Value Range:

0: Position deviation cleared upon S-OFF or non-operational state
1: Position deviation cleared upon fault or non-operational state
2: Position deviation cleared upon active DI function 35 or non-operational state

Description

Defines the condition for clearing the position deviation.

H05.17 **Number of encoder frequency-division pulses**

Address: 0x0511
Min.: 0 Unit: PPR
Max.: 4194303 Data Type: UInt32
Default: 2500 Change: At stop

Value Range:

0 PPR to 4194303 PPR

Description

Defines the number of pulses output by PAO or PBO per revolution.

Pulse output resolution per revolution = (H05.17) x 4

H05.19 Speed feedforward control

Address:	0x0513		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: No speed feedforward

1: Internal speed feedforward

2: External speed feedforward

3: Zero phase

Description

Defines the source of the speed loop feedforward signal.

When the external speed feedforward is set, the feedforward source is set by H05.72.

H05.20 Condition for COIN (positioning completed) signal output

Address:	0x0514		
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Absolute value of position deviation lower than H05.21
1: Absolute value of position deviation lower than H05.21 and filtered position reference being 0
2: Absolute value of position deviation lower than H05.21 and unfiltered position reference being 0
3: Absolute position deviation kept lower than H05.21 within the time defined by H05.60 and unfiltered position reference being 0
4: Absolute position deviation kept lower than H05.21 within the time defined by H05.60 and filtered position reference being 0
5: Absolute value of position deviation lower than H05.21, with zero speed signal being active and unfiltered position reference being 0
6: Absolute value of position deviation lower than H05.21, with zero speed signal being active and filtered position reference being 0
7: COIN signal judged after the change (available→unavailable) of the unfiltered position reference kept active for the period defined by H05.60, with unfiltered position reference being 0 and position deviation lower than H05.21
8: COIN signal judged after the change (available→unavailable) of the filtered position reference kept active for the period defined by H05.60, with filtered position reference being 0 and position deviation lower than H05.21
9: COIN signal judged after the change (available→unavailable) of the unfiltered position reference, with the position deviation kept lower than H05.21 for the period defined by H05.60 and unfiltered position reference being 0
10: COIN signal judged after the change (available→unavailable) of the filtered position reference, with the position deviation kept lower than H05.21 for the period defined by H05.60 and filtered position reference being 0

Description

Defines the condition for outputting positioning completed/proximity signal. In the position control mode, if the absolute value of the position deviation during operation is within the setpoint of H05.21, the drive outputs the positioning completed/proximity signal. You can set the condition for outputting the positioning completed/proximity signal in H05.20.

H05.21 Threshold of positioning completed

Address:	0x0515		
Min.:	1	Unit:	Encoder unit
Max.:	65535	Data Type:	UInt16
Default:	5872	Change:	Real-time modification

Value Range:

1 to 65535

Description

Defines the threshold of the absolute value of position deviation when the drive outputs the positioning completed signal.

H05.22 Proximity threshold

Address:	0x0516		
Min.:	1	Unit:	Encoder unit
Max.:	65535	Data Type:	UInt16
Default:	65535	Change:	At once

Value Range:

1 to 65535

Description

Defines the threshold of the absolute value of position deviation when the drive outputs the proximity signal.

H05.24 Displacement of interrupt positioning

Address:	0x0518		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Real-time modification

Value Range:

-1073741824 to 1073741824

Description

Defines the position reference value during interrupt positioning.

H05.26 Constant operating speed in interrupt positioning

Address:	0x051A		
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the maximum speed during interrupt positioning.

H05.27 Acceleration/Deceleration time of interrupt positioning

Address:	0x051B		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

Defines the time for the motor to change from 0 rpm to 1000 rpm at a constant speed during interrupt positioning.

H05.29 Interrupt positioning cancel signal

Address:	0x051D		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0: Disable

1: Enable

Description

Defines whether to unlock the interrupt positioning signal.

H05.30 Homing selection

Address:	0x051E		
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disabled

1: Homing enabled through the HomingStart signal input from DI

2: Electrical homing enabled through the HomingStart signal input from DI

3: Homing started immediately upon power-on

4: Homing executed immediately

5: Electrical homing started

6: Current position as home

8: D-triggered position as home

Description

Defines the homing mode and the trigger signal source.

H05.31 Homing mode

Address:	0x051F		
Min.:	0	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Forward, home switch as deceleration point and home
1: Reverse, home switch as deceleration point and home
2: Forward, Z signal as deceleration point and home
3: Reverse, motor Z signal as deceleration point and home
4: Forward, home switch as deceleration point and Z signal as home
5: Reverse, home switch as deceleration point and Z signal as home
6: Forward, positive limit switch as deceleration point and home
7: Reverse, negative limit switch as deceleration point and home
8: Forward, positive limit switch as deceleration point and Z signal as home
9: Reverse, negative limit switch as deceleration point and Z signal as home
10: Forward, mechanical limit position as deceleration point and home
11: Reverse, mechanical limit position as deceleration point and home
12: Forward, mechanical limit position as deceleration point and Z signal as home
13: Reverse, mechanical limit position as deceleration point and Z signal as home
14: Forward single-turn homing
15: Reverse single-turn homing
16: Single-turn nearby homing

Description

Defines the default motor direction of rotation, deceleration point, and home during homing.

H05.32 Speed in high-speed searching for the home switch signal

Address: 0x0520

Min.:	0	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

0 to 3000

Description

Defines the motor speed for searching for the deceleration point signal during homing.

H05.33 Speed in low-speed searching for the home switch signal

Address: 0x0521

Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 1000

Description

Defines the motor speed for searching for the home signal during homing.

H05.34 **Acceleration/Deceleration time during homing**

Address:	0x0522		
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	1000	Change:	At once

Value Range:

0 to 1000

Description

Defines the time for the motor to accelerate from 0 rpm to 1000 rpm at a constant speed during homing.

H05.35 **Homing time limit**

Address:	0x0523		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	At once

Value Range:

0 to 65535

Description

Defines the maximum homing time.

H05.36 **Mechanical home offset**

Address:	0x0524		
Min.:	-2147483648	Unit:	Reference unit
Max.:	-2147483647	Data Type:	Int32
Default:	0	Change:	At once

Value Range:

-2147483648 to +2147483647

Description

Defines the absolute position value of the motor after homing.

H05.38 **Frequency-division output source**

Address:	0x0526		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Encoder frequency-division output

1: Pulse reference synchronous output

2: Frequency-division output inhibited

3: Second encoder frequency-division output

Description

Defines the output source of the pulse output terminal.

Setpoint	Output Source	Remarks
0	Encoder frequency-division output	The encoder feedback signal is outputted only after being divided by the value of H05.17 during rotation of the motor. Encoder frequency-division output mode is recommended when the host controller is used for closed-loop feedback.
1	Pulse reference synchronous output	The input pulse references are outputted synchronously only when H05.00 is set to 0. When the pulses of multi-axis servo is tracked synchronously, synchronous output of pulse references is recommended.
2	Frequency-division output inhibited	No output is generated from pulse output terminals. In this case, frequeny-division output terminals act as the input terminals of fully closed-loop external scale signals.
3	Second encoder frequency-division output	The encoder feedback signal is outputted only after being divided by the value of H05.17 during rotation of the motor.

H05.39 Electronic gear ratio switchover condition

Address: 0x0527

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At stop

Value Range:

0: Switched if position reference kept 0 for 2.5 ms

1: Switched in real time

Description

Defines the condition for switching the electronic gear ratio.

H05.40 Mechanical home offset and action upon overtravel

Address: 0x0528

Min.: 0 Unit: -

Max.: 3 Data Type: UInt16

Default: 0 Change: At once

Value Range:

0: H05.36 as the coordinate after homing, reverse homing applied after homing triggered again upon overtravel
1: H05.36 as the relative offset after homing, reverse homing applied after homing triggered again upon overtravel
2: H05.36 as the coordinate after homing, reverse homing applied automatically upon overtravel
3: H05.36 as the relative offset after homing, reverse homing applied automatically upon overtravel

Description

Defines the offset relationship between the mechanical home and mechanical zero point, as well as the action upon overtravel during homing.

H05.41 Z pulse output polarity

Address: 0x0529

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 1 | Change: At stop

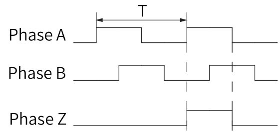
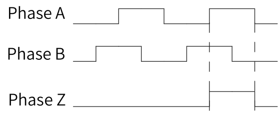
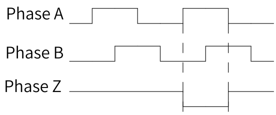
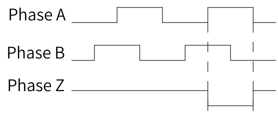
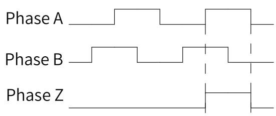
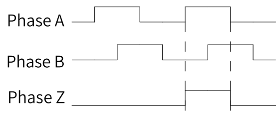
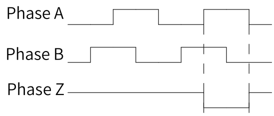
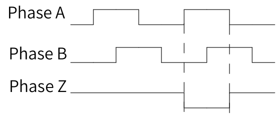
Value Range:

bit	Name	Function
0	Frequency-division Z output polarity	0: Positive (high level upon active Z pulse)
		1: Negative (low level upon active Z pulse)
1	OCZ output polarity	0: Positive (high level upon active Z pulse)
		1: Negative (low level upon active Z pulse)
2	Inner loop probe Z signal source	0: Motor Z signal
		1: Frequency-division output Z signal

Description

Defines the output level when the Z pulse of pulse output terminal is active.

Table 4–4 Pulse diagrams of encoder frequency-division output (H05.38 = 0)

H02.03 (Output pulse phase)	H05.41 (Z pulse output polarity)	Pulse Output Diagram of Forward RUN	Pulse Output Diagram of Reverse RUN
0	0	 Phase A leads phase B by 90°.	 Phase B leads phase A by 90°.
	1	 Phase A leads phase B by 90°.	 Phase B leads phase A by 90°.
1	0	 Phase B leads phase A by 90°.	 Phase A leads phase B by 90°.
	1	 Phase B leads phase A by 90°.	 Phase A leads phase B by 90°.

It is recommended to use the active edge outputted by Z signal when a high precision frequency-division output of Z signal is required.

Setpoint	Z pulse output polarity
0	Positive (high level upon active Z pulse)
1	Negative (low level upon active Z pulse)

H05.41 = 0: Falling-edge triggered; H05.41 = 1: Rising-edge triggered

H05.43 Position pulse edge

Address: 0x052B

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Rising edge-triggered

1: Falling edge-triggered

Description

The setpoint 0 indicates calculation starts from the falling edge of pulse input.
The setpoint 1 indicates calculation starts from the rising edge of pulse input.

H05.44 Numerator of frequency-division output reduction ratio

Address:	0x052C		
Min.:	1	Unit:	-
Max.:	16383	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 16383

Description

Defines the numerator of frequency-division output reduction ratio.

H05.45 Denominator of frequency-division output reduction ratio

Address:	0x052D		
Min.:	1	Unit:	-
Max.:	8191	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 8191

Description

Defines the denominator of frequency-division output reduction ratio.

H05.46 DI selection of multi-turn frequency-division Z starting point

Address:	0x052E		
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: No selection

1: DI1

2: DI2

3: DI3

4: DI4

5: DI5

6: DI6

7: DI7

8: DI8

Description

In the absolute position linear mode, the position offset is the difference between absolute position of current encoder and the mechanical position.

H05.47 Frequency-division Z pulse width

Address:	0x052F		
Min.:	0	Unit:	us
Max.:	400	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 us to 400 us

Description

Defines the minimum output width (us) of frequency-division output PZ.

H05.50 Mechanical gear ratio (numerator) in absolute position rotation mode

Address:	0x0532		
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 65535

Description

Defines the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

H05.51 Mechanical gear ratio (denominator) in absolute position rotation mode

Address:	0x0533		
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 65535

Description

Defines the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

H05.52 Pulses per revolution of the load in absolute position rotation mode (low 32 bits)

Address:	0x0534		
Min.:	0	Unit:	Encoder unit
Max.:	4294967295	Data Type:	UInt32

Default:	0	Change:	At stop

Value Range:

0 to 4294967295

Description

Defines the number of pulses per revolution of the rotary load in the absolute position rotation mode.

H05.54 Pulses per revolution of the load in absolute position rotation mode (high 32 bits)

Address:	0x0536		
Min.:	0	Unit:	Encoder unit
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	At stop

Value Range:

0 to 4294967295

Description

Defines the number of pulses per revolution of the rotary load in the absolute position rotation mode.

H05.58 Torque threshold in homing upon hit-and-stop

Address:	0x053A		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the maximum positive/negative torque limit during homing upon hit-and-stop.

H05.59 Positioning window time

Address:	0x053B		
Min.:	0	Unit:	ms
Max.:	30000	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 ms to 30000 ms

Description

If the positioning deviation is less than the time threshold of positioning completed, the positioning completed signal is active only if the set time threshold is exceeded.

H05.60 Hold time of positioning completed

Address:	0x053C		
Min.:	0	Unit:	ms
Max.:	30000	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 ms to 30000 ms

Description

Defines the hold time of an active positioning completed signal.

H05.66 Homing time unit

Address:	0x0542		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0: 1 ms

1: 10 ms

2: 100 ms

Description

Defines the homing time unit. The actual timeout time is H05.35 x H05.66 (ms).

H05.67 Offset between zero point and single-turn absolute position

Address:	0x0543		
Min.:	-2147483648	Unit:	Encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	At stop

Value Range:

-2147483648 to +2147483647

Description

Defines the offset position relative to the home when H05.31 is set to 14, 15, and 16.

H05.70 Moving average filter time constant 2

Address:	0x0546		
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0.0 ms to 1000.0 ms

Description

Defines the moving average filter time constant for the second group of position references.

See *" H05.06" on page 174* for details.

H05.71 Motor Z signal width

Address:	0x0546		
Min.:	1	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	4	Change:	At once

Value Range:

1 ms to 100 ms

Description

Defines the pulse width output upon active motor Z signal.

H05.72 External speed feedforward source selection

Address:	0x0548		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

0: 60B1

1: AI1

Description

External speed feedforward source selection

4.7 H06 Speed Control Parameters

H06.00 Source of main speed reference A

Address:	0x0600		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Digital setting (H06.03)

1: AI1

Description

Defines the source of main speed reference A.

H06.01 Source of auxiliary speed reference B

Address: 0x0601
Min.: 0 Unit: -
Max.: 5 Data Type: UInt16
Default: 1 Change: At stop

Value Range:

0: Digital setting (H06.03)

1: AI1

5: Multi-speed reference

Description

Defines the source of auxiliary speed reference B.

H06.02 Speed reference source

Address: 0x0602
Min.: 0 Unit: -
Max.: 4 Data Type: UInt16
Default: 0 Change: At stop

Value Range:

0: Source of main speed reference A

1: Source of auxiliary speed reference B

2: A+B

3: Switched between A and B

4: Communication

Description

Defines the source of speed references.

<table>
<tr><th>Setpoint</th><th>Control mode</th><th>Remarks</th></tr>
<tr><td>0</td><td>Source of main speed reference A</td><td>The reference source is defined by H06.00.</td></tr>
<tr><td>1</td><td>Source of auxiliary speed reference B</td><td>The reference source is defined by H06.01.</td></tr>
<tr><td>2</td><td>A+B</td><td>The reference source is the product of A + B (H06.00 + H06.01).</td></tr>
<tr><td>3</td><td>Switched between A and B</td><td>The reference source is switched between A and B as defined by FunIN.4 (Cmd_SEL).
<table><tr><th>State of FunIN.4 (Cmd_SEL)</th><th>Reference Source</th></tr><tr><td>Inactive</td><td>Source of main speed reference A</td></tr><tr><td>Active</td><td>Source of auxiliary speed reference B</td></tr></table></td></tr>
<tr><td>4</td><td>Communication</td><td>The speed reference is defined by operating on H31.09 through communication (unit: 0.001 RPM).</td></tr>
</table>

H06.03 Speed reference set through keypad

Address: 0x0603
Min.: -10000 | Unit: rpm
Max.: 10000 | Data Type: Int16
Default: 200 | Change: Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

Defines the speed reference value set through the keypad.

H06.04 DI jog speed reference

Address: 0x0604
Min.: 0 | Unit: rpm
Max.: 10000 | Data Type: Int16
Default: 150 | Change: Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the DI jog speed reference.

H06.05 Acceleration ramp time of speed reference

Address: 0x0605
Min.: 0 | Unit: ms
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0 to 65535

Description

Defines the acceleration ramp time of speed reference.

The acceleration/deceleration time constant of multi-speed references are defined only by parameters in group H12.

H06.05 defines the time for the speed reference to change from 0 rpm to 1000 rpm.

H06.06 defines the time for the speed reference to change from 1000 rpm to 0 rpm.

The formulas for calculating the actual acceleration/deceleration time are as follows:

Actual acceleration time t1 = Speed reference/1000 x Acceleration ramp time of speed reference

Actual deceleration time t2 = Speed reference/1000 x Deceleration ramp time of speed reference

H06.06 Deceleration ramp time of speed reference

Address:	0x0606		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

Defines the deceleration ramp time of speed reference.

H06.07 Maximum speed limit

Address:	0x0607		
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the maximum speed limit.

H06.08 Forward speed limit

Address:	0x0608		
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the forward speed threshold.

H06.09 Reverse speed limit

Address:	0x0609		
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the reverse speed threshold.

H06.10 Deceleration unit in emergency stop

Address: 0x060A

Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Multiplied by 1

1: Multiplied by 10

2: Multiplied by 100

Description

Defines the deceleration unit in emergency stop.

H06.11 Torque feedforward control

Address: 0x060B

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0: No torque feedforward

1: Internal torque feedforward

Description

Define whether to use torque feedforward control.

H06.12 Jog speed acceleration ramp time

Address: 0x060C

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

Defines the acceleration ramp time of jog speed.

H06.13 Speed feedforward smoothing filter

Address: 0x060D

Min.:	0	Unit:	us
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 us to 65535 us

Description

Defines the speed feedforward filter time constant.

H06.15 Zero clamp speed threshold

Address: 0x060F

Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the zero clamp speed threshold.

H06.16 Threshold of TGON (motor rotation) signal

Address: 0x0610

Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	20	Change:	At once

Value Range:

0 to 1000

Description

Defines the motor rotation speed threshold.

H06.17 Threshold of V-Cmp (speed matching) signal

Address: 0x0611

Min.:	0	Unit:	rpm
Max.:	100	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 rpm to 100 rpm

Description

Defines the speed threshold at which the V-Cmp (speed matching) signal is active.

H06.18 Threshold of speed reach signal

Address: 0x0612

Min.:	20	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	1000	Change:	Real-time modification

Value Range:

20 rpm to 10000 rpm

Description

Defines the threshold of speed reached signal.

H06.19 Threshold of zero speed output signal

Address:	0x0613		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

Defines the threshold of zero speed output signal.

H06.40 Deceleration time of ramp 1

Address:	0x0628		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

Defines the deceleration time of ramp 1.

H06.41 Deceleration time of ramp 2

Address:	0x0629		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

Defines the deceleration time of ramp 2.

H06.50 Speed S-curve enable switch

Address:	0x0628		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Disable

1: Enable

Description

0: Accelerate/Decelerate at fixed acceleration rate

1: Accelerate/Decelerate based on the S-curve

H06.51 Increasing acceleration 1 of speed S-curve acceleration segment

Address:	0x0633		
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	50	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.

Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.52 Decreasing acceleration 1 of speed S-curve acceleration segment

Address:	0x0634		
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	50	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.

Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.53 Decreasing deceleration 1 of speed S-curve deceleration segment

Address:	0x0635		
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	50	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.

Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.54 Decreasing acceleration 1 of speed S-curve deceleration segment

Address:	0x0636		
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	50	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.55 Increasing acceleration 2 of speed S-curve acceleration segment

Address:	0x0637	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.56 Decreasing acceleration 2 of speed S-curve acceleration segment

Address:	0x0638	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.57 Decreasing deceleration 2 of speed S-curve deceleration segment

Address:	0x0639	Effective Time:	Real time

Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.58 Decreasing acceleration 2 of speed S-curve deceleration segment

Address:	0x063A	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.59 Increasing acceleration 3 of speed S-curve acceleration segment

Address:	0x063B	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.60 Decreasing acceleration 3 of speed S-curve acceleration segment

Address:	0x063C	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16

Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.61 Decreasing deceleration 3 of speed S-curve deceleration segment

Address:	0x063D	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.62 Decreasing acceleration 3 of speed S-curve deceleration segment

Address:	0x063E	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.63 Increasing acceleration 4 of speed S-curve acceleration segment

Address:	0x063F	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.64 Decreasing acceleration 4 of speed S-curve acceleration segment

Address:	0x0640	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.65 Decreasing deceleration 4 of speed S-curve deceleration segment

Address:	0x0641	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.66 Decreasing acceleration 4 of speed S-curve deceleration segment

Address:	0x0642	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.67 Increasing acceleration 5 of speed S-curve acceleration segment

Address:	0x0643	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.68 Decreasing acceleration 5 of speed S-curve acceleration segment

Address:	0x0644	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.69 Decreasing deceleration 5 of speed S-curve deceleration segment

Address:	0x0645	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.70 Decreasing acceleration 5 of speed S-curve deceleration segment

Address:	0x0646	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.71 Increasing acceleration 6 of speed S-curve acceleration segment

Address:	0x0647	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.72 Decreasing acceleration 6 of speed S-curve acceleration segment

Address:	0x0648	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.73 Decreasing deceleration 6 of speed S-curve deceleration segment

Address:	0x0649	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.74 Decreasing acceleration 6 of speed S-curve deceleration segment

Address:	0x064A	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.75 Increasing acceleration 7 of speed S-curve acceleration segment

Address:	0x064B	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.76 Decreasing acceleration 7 of speed S-curve acceleration segment

Address:	0x064C	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.77 Decreasing deceleration 7 of speed S-curve deceleration segment

Address:	0x064D	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.78 Decreasing acceleration 7 of speed S-curve deceleration segment

Address:	0x064E	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.79 Increasing acceleration 8 of speed S-curve acceleration segment

Address:	0x064F	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.80 Decreasing acceleration 8 of speed S-curve acceleration segment

Address:	0x0650	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.81 Decreasing deceleration 8 of speed S-curve deceleration segment

Address:	0x0651	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.82 Decreasing acceleration 8 of speed S-curve deceleration segment

Address:	0x0652	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

4.8 H07 Torque Control Parameters

H07.00 Source of main torque reference A

Address:	0x0700		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Keypad (H07.03)

1: AI1

Description

Defines the source of main torque reference A.

H07.01 Source of auxiliary torque reference B

Address:	0x0701		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Keypad (H07.03)

1: AI1

Description

Defines the source of auxiliary torque references.

H07.02 Torque reference source

Address: 0x0702

Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Source of main torque reference A

1: Source of auxiliary torque reference B

2: Source of A+B

3: Switched between A and B

4: Communication

Description

Defines the torque reference source.

<table>
<tr><th>Setpoint</th><th>Control mode</th><th>Remarks</th></tr>
<tr><td>0</td><td>Source of main torque reference A</td><td>The reference source is defined by H07.00.</td></tr>
<tr><td>1</td><td>Source of auxiliary torque reference B</td><td>The reference source is defined by H07.01.</td></tr>
<tr><td>2</td><td>A+B</td><td>The reference source is the product of A+B (H07.00+H07.01).</td></tr>
<tr><td>3</td><td>Switched between A and B</td><td>The reference source is switched between A and B as defined by FunIN.4 (Cmd_SEL).
<table><tr><th>State of FunIN.4 (Cmd_ SEL)</th><th>Reference Source</th></tr><tr><td>Inactive</td><td>Source of main torque reference A</td></tr><tr><td>Active</td><td>Source of auxiliary torque reference B</td></tr></table></td></tr>
<tr><td>4</td><td>Communication</td><td>The torque reference is defined by operating on H31.11 through communication.</td></tr>
</table>

H07.03 Torque reference set through keypad

Address: 0x0703

Min.:	-400	Unit:	%
Max.:	400	Data Type:	Int16
Default:	0	Change:	At once

Value Range:

-400.0% to +400.0%

Description

Defines the torque reference value set through keypad

H07.05 Torque reference filter time constant 1

Address:	0x0705		
Min.:	0	Unit:	ms
Max.:	30	Data Type:	UInt16
Default:	0.5	Change:	At once

Value Range:

0.00 ms to 30.00 ms

Description

Defines the torque reference filter time constant 1.

H07.06 Torque reference filter time constant 2

Address:	0x0706		
Min.:	0	Unit:	ms
Max.:	30	Data Type:	UInt16
Default:	0.27	Change:	At once

Value Range:

0.00 ms to 30.00 ms

Description

Defines the torque reference filter time constant 2.

H07.07 Torque limit source

Address:	0x0707		
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Positive/Negative internal torque limit

1: Internal or external limit as defined by DI

2: T-LMT

3: T_LMT or external limit as defined by DI (FunIN.16 or FunIN.17)

4: T_LMT or internal limit (FunIN.16 or FunIN.17) as defined by DI

Description

Defines the torque limit source.

H07.08 T-LMT selection

Address:	0x0708	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

1: AI1

Description

Sets the AI as the torque limit source.

H07.09 Positive internal torque limit

Address:	0x0709		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	350	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the positive internal torque limit.

H07.10 Negative internal torque limit

Address:	0x070A		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	350	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the negative internal torque limit.

H07.11 Positive external torque limit

Address:	0x070B		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	350	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the positive external torque limit.

H07.12 Negative external torque limit

Address:	0x070C		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	350	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the negative external torque limit.

H07.15 Emergency stop torque

Address:	0x070F		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the emergency stop torque.

H07.17 Speed limit source

Address:	0x0711		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Internal speed limit

1: V-LMT

2: H07.19 or H07.20 as defined by DI

Description

Defines the speed limit source.

H07.18 V-LMT selection

Address:	0x0712	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

1: AI1

Description

Sets the AI as the speed limit source.

H07.19 Positive speed limit/Speed limit 1 in torque control

Address:	0x0713	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16

Default: 3000 | Change: Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the positive speed limit in torque control.

H07.20 Negative speed limit/Speed limit 2 in torque control

Address:	0x0714	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

Defines the negative speed limit in torque control.

H07.21 Base value for torque reach

Address:	0x0715		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the base value for torque reach.

H07.22 Threshold of valid torque reach

Address:	0x0716		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	20	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the threshold of valid torque reach.

H07.23 Threshold of invalid torque reach

Address:	0x0717		
Min.:	0	Unit:	%
Max.:	400	Data Type:	UInt16

Default:	10	Change:	At once

Value Range:

0.0% to 400.0%

Description

Defines the threshold of invalid torque reach.

H07.24 Field weakening depth

Address:	0x0718		
Min.:	60	Unit:	%
Max.:	115	Data Type:	UInt16
Default:	115	Change:	At once

Value Range:

60% to 115%

Description

Defines the field weakening depth.

H07.25 Max. permissible demagnetizing current

Address:	0x0719		
Min.:	0	Unit:	%
Max.:	3200	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

0% to 300%

Description

Defines the maximum permissible demagnetizing current.

H07.26 Field weakening selection

Address:	0x071A		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Disable

1: Enable

Description

Defines whether to enable field weakening.

H07.27 Field weakening gain

Address:	0x071B		
Min.:	0.001	Unit:	Hz
Max.:	1	Data Type:	UInt16

Default:	0.03	Change:	At once

Value Range:

0.001 Hz to 1.000 Hz

Description

Defines the field weakening gain.

H07.28 Speed of field weakening point

Address:	0x071C		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Defines the speed of the field weakening point.

H07.35 Torque non-standard feature enable

Address:	0x0723		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

bit0: Motor output correction enable

bit1: Shield compensation data enable

Description

Torque non-standard feature enable switch.

H07.36 Time constant of low-pass filter 2

Address:	0x0724		
Min.:	0	Unit:	ms
Max.:	10	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0.00 ms to 10.00 ms

Description

Defines the time constant of low-pass filter 2.

H07.37 Torque reference filter selection

Address:	0x0725		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16

Default:	0	Change:	At once

Value Range:

0: First-order filter

1: Biquad filter

Description

Defines the torque reference filter used.

H07.38 Biquad filter attenuation ratio

Address:	0x0726		
Min.:	0	Unit:	-
Max.:	50	Data Type:	UInt16
Default:	16	Change:	At stop

Value Range:

0 to 50

Description

Defines the biquad filter attenuation ratio.

H07.40 Speed limit window in the torque control mode

Address:	0x0728		
Min.:	0	Unit:	ms
Max.:	300	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms to 300 ms

Description

Defines the speed limit window in the torque control mode.

4.9 H08 Gain parameters

H08.00 Speed loop gain

Address:	0x0800		
Min.:	0.1	Unit:	Hz
Max.:	2000	Data type:	UInt16
Default:	40	Change:	At once

Value Range:

0.1 Hz to 2000.0 Hz

Description

Defines the responsiveness of the speed loop. The higher the setpoint, the faster the speed loop response is. Note that an excessively high setpoint may cause vibration.
In the position control mode, the position loop gain must be increased together with the speed loop gain.

H08.01 Speed loop integral time constant

Address:	0x0801		
Min.:	0.15	Unit:	ms
Max.:	512	Data type:	UInt16
Default:	19.89	Change:	At once

Value Range:

0.15 ms to 512.00 ms

Description

Defines the integral time constant of the speed loop.

The lower the setpoint, the better the integral action, and the quicker will the deviation value be close to 0.
Note:
There is no integral action when H08.01 is set to 512.00.

H08.02 Position loop gain

Address:	0x0802		
Min.:	0.1	Unit:	Hz
Max.:	2000	Data type:	UInt16
Default:	64	Change:	At once

Value Range:

0.1 Hz to 2000.0 Hz

Description

Defines the proportional gain of the position loop.

Defines the responsiveness of the position loop. A high setpoint shortens the positioning time. Note that an excessively high setpoint may cause vibration.

The 1st group of gain parameters include H08.00 (Speed loop gain), H08.01 (Speed loop integral time constant), H08.02, and H07.05 (Filter time constant of torque reference).

H08.03 2nd speed loop gain

Address:	0x0803		
Min.:	0.1	Unit:	Hz
Max.:	2000	Data type:	UInt16
Default:	75	Change:	At once

Value Range:

0.1 Hz to 2000.0 Hz

Description

-

H08.04 2nd speed loop integral time constant

Address:	0x0804		
Min.:	0.15	Unit:	ms
Max.:	512	Data type:	UInt16
Default:	10.61	Change:	At once

Value Range:

0.15 ms to 512.00 ms

Description

-

H08.05 2nd position loop gain

Address:	0x0805		
Min.:	0.1	Unit:	Hz
Max.:	2000	Data type:	UInt16
Default:	120	Change:	At once

Value Range:

0.1 Hz to 2000.0 Hz

Description

Defines the second gain set of the position loop and speed loop. The 2nd group of gain parameters include H08.03 (Speed loop gain), H08.04 (Speed loop integral time constant), H08.05, and H07.06 (Torque reference filter time constant 2).

H08.08 2nd gain mode setting

Address:	0x0808		
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default:	1	Change:	At once

Value Range:

0: Fixed to the 1st gain, switched between P and PI as defined by bit26 of external 60FEh

1: Switched between the 1st and 2nd gain sets as defined by H08.09

Description

Defines the mode for switching to the 2nd gain set.

H08.09 Gain switchover condition

Address:	0x0809		
Min.:	0	Unit:	-

Max.:	10	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Fixed to the 1st gain set (PS)
1: Switched as defined by bit26 of 60FEh
2: Torque reference too large (PS)
3: Speed reference too large (PS)
4: Speed reference change rate too large (PS)
5: Speed reference low/high speed threshold (PS)
6: Position deviation too large (P)
7: Position reference available (P)
8: Positioning unfinished (P)
9: Actual speed (P)
10: Position reference + Actual speed (P)

Description

Used to set the condition for gain switchover.

Value	Gain Switchover condition	Remarks
0	Fixed to the 1st gain set	The 1st gain set applies.
1	Switched as defined by bit26 of 60FEh	-
2	Torque reference too large	If the torque reference absolute value exceeds (Level + Dead time) [%] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of the torque reference is lower than (level – Dead time) [%] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.
3	Speed reference too large	If the speed reference absolute value exceeds (Level + Dead time) [rpm] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of the speed reference is lower than (level - Dead time) [rpm] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.
4	Speed reference too large	Active in the control modes other than speed control If the absolute value of speed reference change rate exceeds (Level + Dead time) [10 rpm/s] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of the speed reference change rate is lower than (level – hysteresis) [10 rpm/s] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. In the speed control mode, the 1st gain set always applies.

Value	Gain Switchover condition	Remarks
5	Speed reference high/low-speed threshold	If the speed reference absolute value exceeds (Level - Dead time) [rpm] in the last 1st gain set, the drive starts to switch to the 2nd gain set, with gains changed gradually. When the speed reference absolute value reaches (Level + Dead time) [rpm], the 2nd gain set applies. If the speed reference absolute value is lower than (Level + Dead time) [rpm] in the last 2nd gain set, the drive starts to return to the 1st gain set, with gains changed gradually. When the speed reference absolute value reaches (Level - Dead time) [rpm], the 1st gain set applies.
6	Position deviation too large	Active only in position control and full closed-loop control. If the position deviation absolute value exceeds (Level + Dead time) [encoder unit] in the last 1st gain set, the drive switches to the 2nd gain set. When the absolute value of the position deviation is lower than (Level - Dead time) [encoder unit] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
7	Position reference available	Active only in position control and full closed-loop control. If the position reference is not 0 in the last 1st gain set, the drive switches to the 2nd gain set. When the position reference is 0 and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
8	Positioning completed	Active only in position control and full closed-loop control. If positioning has not been completed in the last 1st gain set, the drive switches to the 2nd gain set. If positioning is not completed and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the servo drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
9	Actual speed too high	Active only in position control and full closed-loop control. If the absolute value of actual speed exceeds (Level + Dead time) [rpm] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of actual speed is lower than (Level - Dead time) [rpm] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
10	Position reference + Actual speed	Active only in position control and full closed-loop control. If the position reference is not 0 in the last 1st gain set, the drive switches to the 2nd gain set. If the position reference is 0 and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the 2nd gain set applies. When the position reference is 0 and the delay defined by (H08.10) is reached, if the absolute value of actual speed is lower than (Level) [rpm], the speed loop integral time constant is fixed to the setpoint of H08.04 (2nd speed loop integral time constant), and others return to the 1st gain set; if the absolute value of actual speed does not reach (Level - Dead time) [rpm], the speed integral also returns to the setpoint of H08.01 (Speed loop integral time constant). If the drive is not in position control or full closed-loop control, the 1st gain set always applies.

H08.10 Gain switchover delay

Address:	0x080A		
Min.:	0	Unit:	ms
Max.:	1000	Data type:	UInt16

Default:	5	Change:	At once

Value Range:

0.0 ms to 1000.0 ms

Description

Defines the delay when the drive switches from the 2nd gain set to the 1st gain set.

H08.11 Gain switchover level

Address:	0x080B		
Min.:	0	Unit:	-
Max.:	20000	Data type:	UInt16
Default:	50	Change:	At once

Value Range:

0 to 20000

Description

Defines the gain switchover level.

Gain switchover is affected by both the level and the dead time, as defined by H08.09. The unit of gain switchover level varies with the switchover condition.

H08.12 Gain switchover dead time

Address:	0x080C		
Min.:	0	Unit:	-
Max.:	20000	Data type:	UInt16
Default:	30	Change:	At once

Value Range:

0 to 20000

Description

Defines the dead time for gain switchover.

Gain switchover is affected by both the level and the dead time, as defined by H08.09. The unit of gain switchover hysteresis varies with the switchover condition.

Note:

Set H08.11 to a value higher than or equal to that of H08.12. Otherwise, the drive forcibly sets H08.11 to the same value as H08.12.

H08.13 Position gain switchover time

Address:	0x080D		
Min.:	0	Unit:	ms
Max.:	1000	Data type:	UInt16
Default:	3	Change:	At once

Value Range:

0.0 ms to 1000.0 ms

Description

In position control, if H08.05 (2nd position loop gain) is much higher than H08.02 (Position loop gain), set the time for switching from H08.02 to H08.05.
This parameter can be used to reduce the impact caused by an increase in the position loop gain.

H08.15 Load moment of inertia ratio

Address: 0x080F

Min.:	0	Unit:	-
Max.:	120	Data type:	UInt16
Default:	1	Change:	At once

Value Range:

0.00 to 120.00

Description

Defines the mechanical load inertia ratio relative to the motor moment of inertia.

When H08.15 is set to 0, it indicates the motor carries no load; if it is set to 1.00, it indicates the mechanical load inertia is the same as the motor moment of inertia.

H08.17 Zero phase delay

Address: 0x0811

Min.:	0	Unit:	ms
Max.:	4	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0 ms to 4.0 ms

Description

-

H08.18 Speed feedforward filter time constant

Address: 0x0812

Min.:	0	Unit:	ms
Max.:	64	Data type:	UInt16
Default:	0.5	Change:	At once

Value Range:

0.00 ms to 64.00 ms

Description

Defines the filter time constant of speed feedforward.

H08.19 Speed feedforward gain

Address: 0x0813

Min.:	0	Unit:	%
Max.:	100	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0% to 100.0%

Description

In position control and full closed-loop control, speed feedforward is the product of speed feedforwad signal multiplied by H08.19 and is part of the speed reference.

Increasing the setpoint improves the responsiveness to position references and reduces the position deviation during operation at a constant speed.

Set H08.18 to a fixed value first, and then increase the value of H08.19 gradually from 0 to a certain value at which speed feedforward achieves the desired effect.

Adjust H08.18 and H08.19 repeatedly until a balanced performance is achieved.

Note:

For how to enable the speed feedforward function and select the speed feedforward signal, see H05.19 (Speed feedforward control).

H08.20 Torque feedforward filter time constant

Address: 0x0814

Min.:	0	Unit:	ms
Max.:	64	Data type:	UInt16
Default:	0.5	Change:	At once

Value Range:

0.00 ms to 64.00 ms

Description

Defines the filter time constant of torque feedforward.

H08.21 Torque feedforward gain

Address: 0x0815

Min.:	0	Unit:	%
Max.:	300	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0% to 300.0%

Description

In control modes other than torque control, torque feedforward is the product of torque feedforwad signal multiplied by H08.21 and is part of the torque reference.

Increasing the setpoint improves the responsiveness to variable speed references and position references and reduces the position deviation during operation at a constant speed.

During parameter adjustment, set H08.20 (Torque feedforward filter time constant) to the default value first, and then increase H08.21 gradually to enhance the effect of torque feedforward. When speed overshoot occurs, keep H08.21 unchanged and increase the value of H08.20. Adjust H08.20 and H08.21 repeatedly until a balanced performance is achieved.

Note:

For how to enable the torque feedforward function and select the torque feedforward signal, see H06.11 (Torque feedforward control).

H08.22 Speed feedback filtering option

Address:	0x0816		
Min.:	0	Unit:	-
Max.:	4	Data type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Inhibited

1: 2 times

2: 4 times

3: 8 times

4: 16 times

Description

Defines the moving average filtering times for speed feedback.

The higher the setpoint, the weaker the speed feedback fluctuation, but the longer the feedback delay will be.

H08.23 Cutoff frequency of speed feedback low-pass filter

Address:	0x0817		
Min.:	100	Unit:	Hz
Max.:	8000	Data type:	UInt16
Default:	8000	Change:	At once

Value Range:

100 Hz to 8000 Hz

Description

Defines the cutoff frequency for first-order low-pass filtering on the speed feedback.

Note:

The lower the setpoint, the weaker the speed feedback fluctuation, and the longer the feedback delay will be.

Setting this parameter to 4000 Hz negates the filtering effect.

H08.24 PDFF control coefficient

Address: 0x0818

Min.:	0	Unit:	%
Max.:	200	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0% to 200.0%

Description

Defines the control mode of the speed loop.

When this parameter is set to 100.0, the speed loop adopts PI control (default) with quick dynamic response.

When this parameter is set to 0.0, speed loop integral action is enhanced, which filters out low-frequency interference but also slows down the dynamic response. H08.24 can be used to keep a good responsiveness of the speed loop, with the anti-interference capacity in low-frequency bands improved and the speed feedback overshoot unaffected.

H08.27 Speed observer cutoff frequency

Address:	0x081B		
Min.:	50	Unit:	Hz
Max.:	600	Data type:	UInt16
Default:	170	Change:	At once

Value Range:

50 Hz to 600 Hz

Description

Defines the cutoff frequency of the speed observer. Note that an excessively high setpoint may incur resonance. Decrease the setpoint properly in case of large speed feedback noise.

H08.28 Speed observer inertia correction coefficient

Address:	0x081C		
Min.:	1	Unit:	%
Max.:	1600	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

1% to 1600%

Description

Defines the speed observer inertia correction coefficient. If H08.15 is set based on the actual inertia, there is no need to adjust this parameter.

H08.29 Speed observer filter time

Address:	0x081D		
Min.:	0	Unit:	ms

Max.: 10 Data type: UInt16
Default: 0.8 Change: At once

Value Range:

0.00 ms to 10.00 ms

Description

Defines the speed observer filter time. It is recommended to set this parameter to a value equal to the sum of H07.05 plus 0.2 ms.

H08.31 Disturbance cutoff frequency

Address: 0x081F
Min.: 10 Unit: Hz
Max.: 4000 Data type: UInt16
Default: 600 Change: At once

Value Range:

10 Hz to 4000 Hz

Description

Defines the cutoff frequency of the disturbance observer. Increasing the setpoint improves the responsiveness of the disturbance observer and the compensation effect. Note that an excessively high setpoint may incur resonance.

H08.32 Disturbance compensation gain

Address: 0x0820
Min.: 0 Unit: %
Max.: 100 Data type: UInt16
Default: 0 Change: At once

Value Range:

0% to 100%

Description

Defines the compensation gain of the disturbance observer. The setpoint 100% indicates full compensation.

H08.33 Disturbance observer inertia correction coefficient

Address: 0x0821
Min.: 1 Unit: %
Max.: 1600 Data type: UInt16
Default: 100 Change: At once

Value Range:

1% to 1600%

Description

Defines the disturbance observer inertia correction coefficient. If H08.15 is set based on the actual inertia, there is no need to adjust this parameter.

H08.37 Phase modulation for medium-frequency jitter suppression 2

Address:	0x0825		
Min.:	-90	Unit:	°
Max.:	90	Data type:	Int16
Default:	0	Change:	At once

Value Range:

-90° to +90°

Description

Defines the compensation phase of medium-frequency jitter suppression 2.

H08.38 Frequency of medium-frequency jitter suppression 2

Address:	0x0826		
Min.:	0	Unit:	Hz
Max.:	1000	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0 Hz to 1000 Hz

Description

Set this parameter based on actual resonance frequency. The valid suppression frequency range for medium-frequency jitter suppression 2 is 100 Hz to 1000 Hz.

H08.39 Compensation gain of medium-frequency jitter suppression 2

Address:	0x0827		
Min.:	0	Unit:	%
Max.:	300	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0% to 300%

Description

Defines the compensation gain for medium-frequency jitter suppression 2. Set this parameter to 40%...55% in general cases. Setting this parameter to 0 negates the effect of medium-frequency jitter suppression 2.

H08.40 Speed observer selection

Address:	0x0828		
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disable

1: Enable

Description

Used to set the enable bit for speed observer.

H08.42 Model control selection

Address:	0x082A		
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disable1: Enable

2: Dual-inertia model

Description

Used to enable model tracking control.

H08.43 Model gain

Address:	0x082B		
Min.:	0.1	Unit:	-
Max.:	2000	Data type:	UInt16
Default:	40	Change:	At once

Value Range:

0.1 to 2000.0

Description

Defines the single inertia model gain. The higher the gain, the faster the position response. Note that an excessively high setpoint may incur excessive overshoot.

H08.46 Feedforward value

Address:	0x082E		
Min.:	0	Unit:	-
Max.:	102.4	Data type:	UInt16
Default:	95	Change:	At once

Value Range:

0.0 to 102.4

Description

Defines the speed feedforward gain for single inertia model control. If overshoot occurs, reduce the setpoint properly.

H08.53 Medium- and low-frequency jitter suppression frequency 3

Address:	0x0835		
Min.:	0	Unit:	Hz
Max.:	300	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0 Hz to 300.0 Hz

Description

Set this parameter based on actual resonance frequency. The resonance suppression range is 100 Hz to 300 Hz.

H08.54 Medium- and low-frequency jitter suppression compensation 3

Address:	0x0836		
Min.:	0	Unit:	%
Max.:	200	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0% to 200%

Description

Defines the compensation gain for medium- and low-frequency suppression compensation 3. The setpoint 200% indicates full compensation.

H08.56 Medium- and low-frequency jitter suppression phase modulation 3

Address:	0x0838		
Min.:	0	Unit:	%
Max.:	600	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0% to 600%

Description

Adjust this parameter based on the actual compensation effect.

H08.59 Medium- and low-frequency jitter suppression frequency 4

Address:	0x083B		
Min.:	0	Unit:	Hz
Max.:	300	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0 Hz to 300.0 Hz

Description

Set this parameter based on actual resonance frequency. The resonance suppression range is 100 Hz to 300 Hz.

H08.60 Medium- and low-frequency jitter suppression compensation 4

Address:	0x083C		
Min.:	0	Unit:	%

Max.:	200	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0% to 200%

Description

Defines the compensation gain for medium- and low-frequency suppression compensation 4. The setpoint 200% indicates full compensation.

H08.61 Medium- and low-frequency jitter suppression phase modulation 4

Address: 0x083D

Min.:	0	Unit:	%
Max.:	600	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0% to 600%

Description

Adjust this parameter based on the actual compensation effect.

H08.62 Position loop integral time constant

Address: 0x083E

Min.:	0.15	Unit:	-
Max.:	512	Data type:	UInt16
Default:	512	Change:	At once

Value Range:

0.15 to 512.00

Description

Defines the position loop integral time constant.

H08.63 2nd position loop integral time constant

Address: 0x083F

Min.:	0.15	Unit:	-
Max.:	512	Data type:	UInt16
Default:	512	Change:	At once

Value Range:

0.15 to 512.00

Description

Defines the 2nd position loop integral time constant.

H08.64 Speed observer feedback source

Address: 0x0840

Min.:	0	Unit:	-

Max.:	1	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disable

1: Enable

Description

-

H08.65 Zero deviation control selection

Address:	0x0841		
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disable

1: Enable

Description

Used to enable/disable zero deviation control.

H08.66 Zero deviation control position average filter

Address:	0x0842		
Min.:	0	Unit:	ms
Max.:	320	Data type:	UInt16
Default:	5	Change:	At once

Value Range:

0.0 ms to 320.0 ms

Description

Defines the average filter time of zero deviation control position. It is recommended to increase the setpoint in case of large noise caused by low command resolution.

H08.68 Speed feedforward of zero deviation control

Address:	0x0844		
Min.:	0	Unit:	%
Max.:	100	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0% to 100.0%

Description

Defines the speed feedforward of zero deviation control.

H08.69 Torque feedforward of zero deviation control

Address:	0x0845		
Min.:	0	Unit:	%
Max.:	100	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0% to 100.0%

Description

Defines the torque feedforward of zero deviation control.

H08.81 Anti-resonance frequency of dual-inertia model

Address:	0x0851		
Min.:	1	Unit:	Hz
Max.:	400	Data type:	UInt16
Default:	20	Change:	At once

Value Range:

1.0 Hz to 400.0 Hz

Description

Used to set the anti-resonance frequency of dual-inertia model. You can set this parameter based on the frequency sweeping analysis of mechanical characteristics.

H08.82 Resonance frequency of dual-inertia model

Address:	0x0852		
Min.:	0	Unit:	Hz
Max.:	6553.5	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0 Hz to 6553.5 Hz

Description

Used to set the resonance frequency of dual-inertia model. You can set this parameter based on the frequency sweeping analysis of mechanical characteristics. If accurate resonance frequency is unknown, set H08.84 based on the inertia ratio of the resonance model.

H08.83 Dual-inertia model gain

Address:	0x0853		
Min.:	0.1	Unit:	s_{-1}
Max.:	300	Data type:	UInt16
Default:	60	Change:	At once

Value Range:

0.1s_{-1} to 300.0s_{-1}

Description

Defines the dual-inertia model gain.

H08.84 Inertia ratio of dual-inertia model

Address:	0x0854		
Min.:	0	Unit:	-
Max.:	120	Data type:	UInt16
Default:	1	Change:	At once

Value Range:

0.00 to 120.00

Description

If the resonance frequency of dual-inertia model is set accurately, there is no need to set this parameter.

H08.88 Speed feedforward value of dual-inertia model

Address:	0x0858		
Min.:	0	Unit:	-
Max.:	6553.5	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0 to 6553.5

Description

Set this parameter to 100% in general cases.

H08.89 Torque feedforward value of dual-inertia model

Address:	0x0859		
Min.:	0	Unit:	-
Max.:	6553.5	Data type:	UInt16
Default:	100	Change:	At once

Value Range:

0.0 to 6553.5

Description

Set this parameter to 100% in general cases.

4.10 H09 Auto-tuning Parameters

H09.00 Gain auto-tuning mode

Address:	0x0900		
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16

Default: 4 | Change: At once

Value Range:

0: Disabled, manual gain tuning required

1: Enabled, gain parameters generated automatically based on the stiffness level

2: Positioning mode, gain parameters generated automatically based on the stiffness level

3: Interpolation mode+Inertia auto-tuning

4: Normal mode+Inertia auto-tuning

6: Quick positioning mode+Inertia auto-tuning

Description

Defines different gain tuning modes. Related gain parameters can be set manually or automatically according to the stiffness level.

H09.01 Stiffness level

Address: 0x0901

Min.:	0	Unit:	-
Max.:	41	Data type:	UInt16
Default:	15	Change:	At once

Value Range:

0 to 41

Description

Defines the stiffness level of the servo system. The higher the stiffness level, the stronger the gains and the quicker the response will be. But an excessively high stiffness level will cause vibration.

The setpoint 0 indicates the weakest stiffness and 41 indicates the strongest stiffness.

H09.02 Adaptive notch mode

Address: 0x0902

Min.:	0	Unit:	-
Max.:	4	Data type:	UInt16
Default:	3	Change:	At once

Value Range:

0: Adaptive notch no longer updated;

1: One adaptive notch activated (3rd notch)

2: Two adaptive notches activated (3rd and 4th notches)

3: Resonance point tested only (displayed in H09.24)

4: Adaptive notch cleared, values of 3rd and 4th notches restored to default

Description

Defines the operation mode of the adaptive notch.

H09.03 Online inertia auto-tuning mode

Address: 0x0903

Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0: Disabled

1: Enabled, changing slowly

2: Enabled, changing normally

3: Enabled, changing quickly

Description

Defines whether to enable online inertia auto-tuning and the inertia ratio update speed during online inertia auto-tuning.

H09.05 Offline inertia auto-tuning mode

Address: 0x0905

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Bi-directional

1: Unidirectional

Description

Defines the offline inertia auto-tuning mode. The offline inertia auto-tuning function can be enabled through H0d.02.

H09.06 Maximum speed of inertia auto-tuning

Address: 0x0906

Min.:	100	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	500	Change:	At stop

Value Range:

100 rpm to 1000 rpm

Description

Defines the maximum permissible speed reference in offline inertia auto-tuning mode.

During inertia auto-tuning, the higher the speed, the more accurate the auto-tuned values. Use the default setpoint in general cases.

H09.07 Time constant for accelerating to the max. speed during inertia auto-tuning

Address: 0x0907

Min.:	20	Unit:	ms
Max.:	800	Data Type:	UInt16
Default:	125	Change:	At stop

Value Range:

20 ms to 800 ms

Description

Defines the time for the motor to accelerate from 0 rpm to the maximum speed of inertia auto-tuning (H09.06) during offline inertia auto-tuning.

H09.08 Interval time after an individual inertia auto-tuning

Address: 0x0908

Min.:	50	Unit:	ms
Max.:	10000	Data Type:	UInt16
Default:	800	Change:	At stop

Value Range:

50 ms to 10000 ms

Description

Defines the interval time between two consecutive speed references when H09.05 (Offline inertia auto-tuning mode) is set to 1 (Positive/Negative triangular wave mode).

H09.09 Number of motor revolutions per inertia auto-tuning

Address: 0x0909

Min.:	0	Unit:	-
Max.:	100	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0.00 to 100.00

Description

Defines the motor revolutions per inertia auto-tuning when H09.05 (Offline inertia auto-tuning mode) is set to 1 (Positive/Negative triangular wave mode).

Note:

When using the offline inertia auto-tuning function, check that the travel distance of the motor at the stop position is larger than the value of H09.09. If not, decrease the value of H09.06 (Maximum speed for inertia auto-tuning) or H09.07 (Time constant of accelerating to max. speed during inertia auto-tuning) properly until the motor travel distance fulfills the requirement.

H09.11 Vibration threshold

Address: 0x090B

Min.:	0	Unit:	%

Max.:	100	Data Type:	UInt16
Default:	5	Change:	At once

Value Range:

0.0% to 100.0%

Description

Defines the warning threshold for current feedback vibration.

H09.12 Frequency of the 1st notch

Address: 0x090C

Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	At once

Value Range:

50 Hz to 8000 Hz

Description

Defines the center frequency of the notch, which is the mechanical resonance frequency.

In the torque control mode, setting the notch frequency to 4000 Hz deactivates the notch function.

H09.13 Width level of the 1st notch

Address: 0x090D

Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0 to 20

Description

Defines the width level of the notch. Use the default setpoint in general cases.

Width level is the ratio of the notch width to the notch center frequency.

H09.14 Depth level of the 1st notch

Address: 0x090E

Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 99

Description

Defines the depth level of the notch.

The depth level of the notch is the ratio between the input to the output at the notch center frequency.
The higher the setpoint, the lower the notch depth and the weaker the mechanical resonance suppression will be. Note that an excessively high setpoint may cause system instability.

H09.15 **Frequency of the 2nd notch**

Address:	0x090F		
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	At once

Value Range:
50 Hz to 8000 Hz
Description
-

H09.16 **Width level of the 2nd notch**

Address:	0x0910		
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:
0 to 20
Description
-

H09.17 **Depth level of the 2nd notch**

Address:	0x0911		
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:
0 to 99
Description
-

H09.18 **Frequency of the 3rd notch**

Address:	0x0912		
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	At once

Value Range:

50 Hz to 8000 Hz

Description

-

H09.19 Width level of the 3rd notch

Address:	0x0913		
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0 to 20

Description

-

H09.20 Depth level of the 3rd notch

Address:	0x0914		
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 99

Description

-

H09.21 Frequency of the 4th notch

Address:	0x0915		
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	At once

Value Range:

50 Hz to 8000 Hz

Description

-

H09.22 Width level of the 4th notch

Address:	0x0916		
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0 to 20

Description

-

H09.23 Depth level of the 4th notch

Address:	0x0917		
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 99

Description

-

H09.24 Auto-tuned resonance frequency

Address:	0x0918		
Min.:	0	Unit:	Hz
Max.:	5000	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 Hz to 5000 Hz

Description

When H09.02 (Adaptive notch mode) is set to 3, the current mechanical resonance frequency is displayed.

H09.26 ITune response

Address:	0x091A		
Min.:	50	Unit:	%
Max.:	500	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

50.0% to 500.0%

Description

Defines the ITune response capability. Increasing the setpoint improves the responsiveness but may incur resonance.

H09.27 ITune mode

Address:	0x091B		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disable1: ITune mode 1

2: ITune mode 2

Description

Function: Setting H09.27 to 1 enables the ITune function.

Note: ITune mode 2 is manufacturer commissioning mode, which should be used with caution.

H09.28 Minimum inertia ratio of ITune

Address:	0x091C		
Min.:	0	Unit:	%
Max.:	80	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0% to 80.0%

Description

Inertia ratio range for ITune adjustment: The minimum and maximum inertia ratios of ITune are 0.0 and 30.0 by default.

If the actual maximum load inertia ratio is higher than 30.0, increase the value of H09.29 to prevent positioning jitter.

If the actual load inertia change range is small, set H09.28 and H09.29 based on actual conditions to achieve optimal control effect.

H09.29 Maximum inertia ratio of ITune

Address:	0x091D		
Min.:	1	Unit:	%
Max.:	120	Data Type:	UInt16
Default:	30	Change:	At once

Value Range:

1.0% to 120.0%

Description

-

H09.32 Gravity compensation value

Address:	0x0920		
Min.:	-100	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

-100% to 100.0%

Description

Defines the gravity compensation value. Setting this parameter properly in vertical axis applications can reduce the falling amplitude upon start.

H09.33 Positive friction compensation value

Address:	0x0921		
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0% to 100.0%

Description

Defines the positive friction compensation value.

H09.34 Negative friction compensation value

Address:	0x0922		
Min.:	-100	Unit:	%
Max.:	0	Data Type:	Int16
Default:	0	Change:	At once

Value Range:

-100.0% to 0.0%

Description

Defines the negative direction friction compensation value.

H09.35 Friction compensation speed

Address:	0x0923		
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0.0 to 20.0

Description

Defines the friction compensation speed.

H09.36 Friction compensation speed

Address:	0x0924		
Min.:	0	Unit:	-
Max.:	19	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Slow speed mode + Speed reference
1: Slow speed mode + Model speed
2: Slow speed mode + Speed feedback
3: Slow speed mode + Observe speed
16: High speed mode + Speed reference
17: High speed mode + Model speed
18: High speed mode + Speed feedback
19: High speed mode + Observe speed

Description

-

H09.37 Vibration monitoring time

Address:	0x0925		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	600	Change:	At once

Value Range:

0 to 65535

Description

The resonance detection suppression function is turned off automatically after the time defined by this parameter elapses. To suppress the resonance suppression function, set this parameter to 65536.

H09.38 Frequency of low-frequency resonance suppression 1 at the mechanical end

Address:	0x0926		
Min.:	1	Unit:	Hz
Max.:	100	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

1.0 Hz to 100.0 Hz

Description

Set this parameter based on the actual jitter frequency.

H09.39 Low-frequency resonance suppression 1 at the mechanical end

Address:	0x0927		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0 to 3

Description

Defines different low-frequency resonance suppression types at the mechanical load. Type 1 features the shortest delay.

H09.44 Frequency of low-frequency resonance suppression 2 at mechanical load end

Address:	0x092C		
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0 to 100.0

Description

Set this parameter based on the actual jitter frequency.

H09.45 Responsiveness of low-frequency resonance suppression 2 at mechanical load end

Address:	0x092D		
Min.:	0.01	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0.01 to 5.00

Description

Use the default setpoint in general cases. Increasing the setpoin shortens the delay time.

H09.47 Width of low-frequency resonance suppression 2 at mechanical load end

Address:	0x092F		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0.00 to 2.00

Description

Use the default setpoint in general cases. Increase the setpoint prolongs the delay time.

H09.49 Frequency of low-frequency resonance suppression 3 at mechanical load end

Address:	0x0931		
Min.:	0	Unit:	-
Max.:	100	Data Type:	UInt16

Default: 0 | Change: At once

Value Range:

0.0 to 100.0

Description

-

H09.50 Responsiveness of low-frequency resonance suppression 3 at mechanical load end

Address: 0x0932

Min.: 0 | Unit: -

Min.: 0.01 | Unit: -

Max.: 5 | Data Type: UInt16

Default: 1 | Change: At once

Value Range:

0.01 to 5.00

Description

-

H09.52 Width of low-frequency resonance suppression 3 at mechanical load end

Address: 0x0934

Min.: 0 | Unit: -

Max.: 2 | Data Type: UInt16

Default: 1 | Change: At once

Value Range:

0.00 to 2.00

Description

-

H09.54 Vibration threshold

Address: 0x0936

Min.: 0 | Unit: %

Max.: 300 | Data Type: UInt16

Default: 50 | Change: At once

Value Range:

0.0% to 300.0%

Description

If the torque fluctuation exceeds the setpoint, an error will be reported. Setting this parameter to 0 hides the resonance detection function.

H09.56 Max. overshoot allowed by ETune

Address: 0x0938

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 2936 Change: At once

Value Range:

0 to 65535

Description

Defines the maximum overshoot value allowed during ETune adjustment.

H09.57 STune resonance suppression switchover frequency

Address: 0x0939

Min.:	0	Unit:	Hz
Max.:	4000	Data Type:	UInt16
Default:	900	Change:	At once

Value Range:

0 Hz to 4000 Hz

Description

If the resonance frequency is lower than the setpoint, use medium-frequency resonance suppression 2 to suppress resonance. Otherwise, use the notch to suppress resonance.

H09.58 STune resonance suppression reset selection

Address: 0x093A

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disable

1: Enable

Description

Used to enable STune resonance suppression reset to clear parameters related to resonance suppression, medium-frequency resonance suppression 2, and notches 3 and 4.

4.11 H0A Fault and Protection Parameters

H0A.00 Power input phase loss protection

Address: 0x0A00

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Enable

1: Disable

Description

Servo drives supporting single-phase/three-phase 220 V and three-phase 380 V power supplies are available. When voltage fluctuation or phase loss occurs on the power supply, the drive triggers power input phase loss protection based on H0A.00.

H0A.01 Absolute position limit

Address:	0x0A01		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Disabled

1: Enabled

2: Enabled after homing

Description

Used to set the activation condition for enabling the software position limit.

H0A.04 Motor overload protection gain

Address:	0x0A04		
Min.:	50	Unit:	-
Max.:	300	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

50 to 300

Description

Determines the motor overload duration before E620.0 (Motor overload) is reported.

You can change the setpoint to advance or delay the time when overload protection is triggered based on the motor temperature. The setpoint 50% indicates the time is cut by half; 150% indicates the time is prolonged by 50%. Set this parameter based on the actual temperature of the motor.

H0A.08 Overspeed threshold

Address:	0x0A08		
Min.:	0	Unit:	rpm
Max.:	20000	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 rpm to 20000 rpm

Description

Defines the overspeed threshold of the motor.

<table>
<tr><th>Setpoint</th><th>Overspeed Threshold</th><th>Condition for Reporting E500.0</th></tr>
<tr><td>0</td><td>Maximum motor speed x 1.2</td><td rowspan="3">If the speed feedback exceeds the overspeed threshold several times, the drive reports E500.0 (Motor overspeed).</td></tr>
<tr><td rowspan="2">1 to 10000</td><td>If H0A-08 ⩾ (Maximum motor speed x 1.2):
Overspeed threshold = Maximum motor speed x 1.2</td></tr>
<tr><td>If H0A-08 < (Maximum motor speed x 1.2):
Overspeed threshold = H0A.08</td></tr>
</table>

H0A.09 Max. pulse input frequency in position control

Address:	0x0A09		
Min.:	100	Unit:	kHz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	At stop

Value Range:

100 kHz to 8000 kHz

Description

Defines the maximum frequency of input pulses when the position reference source is pulse reference (H05.00 = 0) in the position control mode.

When the actual pulse input frequency exceeds the value of H0A.09, the drive reports EB01.0 (Position reference input error).

H0A.10 Threshold of excessive local position deviation

Address:	0x0A0A		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	27486951	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Defines the threshold for excessive position deviation in the position control mode.

When the position deviation exceeds this threshold, the drive reports EB00.0 (Position deviation too large).

H0A.12 Runaway protection

Address:	0x0A0C		
Min.:	0	Unit:	-

Max.: 1 | Data Type: UInt16
Default: 1 | Change: At once

Value Range:

0: Disable

1: Enable

Description

Defines whether to enable runaway protection.

0: Hide the detection on E234.0 in applications where the motor drives a vertical axis or is driven by the load

1: Enable runaway protection

H0A.17 Reference pulse selection

Address:	0x0A11		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Pulse unit

1: Reference unit

Description

Defines the unit for the position settings in H05.21, H05.22, and H0A.10.

H0A.18 IGBT overtemperature threshold

Address:	0x0A12		
Min.:	120	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	140	Change:	At once

Value Range:

120°C to 175°C

Description

Defines the threshold for reporting E640.0 (IGBT overtemperature) and E640.1 (Flywheel diode overtemperature).

H0A.19 Filter time constant of touch probe 1

Address:	0x0A13		
Min.:	0	Unit:	us
Max.:	6.3	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0.00 us to 6.30 us

Description

Defines the filter time of touch probe 1. An active input must last for the time defined by H0A.19.

H0A.20 Filter time constant of touch probe 2

Address:	0x0A14		
Min.:	0	Unit:	us
Max.:	6.3	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0.00 us to 6.30 us

Description

Defines the filter time of touch probe 2. An active input must last for the time defined by H0A.20.

H0A.23 TZ signal filter time

Address:	0x0A17		
Min.:	0	Unit:	25 ns
Max.:	31	Data Type:	UInt16
Default:	15	Change:	At stop

Value Range:

0 ns to 31 ns

Description

-

H0A.24 Filter time constant of low-speed pulse input pin

Address:	0x0A18		
Min.:	0	Unit:	25 ns
Max.:	255	Data Type:	UInt16
Default:	30	Change:	At stop

Value Range:

0 ns to 255 ns

Description

Defines the filter time constant of low-speed pulse input terminal which is enabled (H05.01 = 0) when the position reference source is pulse input (H05.00 = 0) in the position control mode.

When peak interference exists in the low-speed pulse input terminal, set this parameter to suppress peak interference and prevent motor malfunction due to interference signal inputted to the servo drive.

H0A.25 Speed display DO low-pass filter time

Address:	0x0538		
Min.:	0	Unit:	ms
Max.:	5000	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 5000

Description

Defines the low-pass filter time constant of the speed information for speed feedback and position references.

H0A.26 Motor overload detection

Address:	0x0A1A		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Show motor overload warning (E909.0) and fault (E620.0)

1: Hide motor overload warning (E909.0) and fault (E620.0)

Description

Defines whether to enable motor overload detection.

H0A.27 Moving average filter time for speed display DO

Address:	0x0A1B		
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	50	Change:	At once

Value Range:

0 ms to 100 ms

Description

Defines the low-pass filter time constant of the speed information for speed feedback and position references.

H0A.29 Fully closed-loop encoder (ABZ) filter time

Address:	0x0A1D		
Min.:	0	Unit:	25 ns
Max.:	65535	Data Type:	UInt16
Default:	4111	Change:	At stop

Value Range:

bit0–bit7: Fully closed loop encoder (ABZ) pulse signal filtering time

bit8–bit15: Fully closed loop encoder (ABZ) wire breakage filter time

Description

-

H0A.30 Filter time constant of high-speed pulse input pin

Address:	0x0A1E		
Min.:	0	Unit:	ns
Max.:	255	Data Type:	UInt16
Default:	3	Change:	At stop

Value Range:

0 ns to 255 ns

Description

Defines the filter time constant of high-speed pulse input terminal which is enabled (H05.01 = 1) when the position reference source is pulse reference (H05.00 = 0) in the position control mode.

When peak interference exists in the high-speed pulse input terminal, set this parameter to suppress peak interference and prevent motor malfunction due to interference signal inputted to the servo drive.

H0A.32 Motor stall over-temperature protection time window

Address:	0x0A20		
Min.:	10	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

10 ms to 65535 ms

Description

Defines the overtemperature duration before E630.0 (Motor stall) is detected by the servo drive.

H0A.32 can be used to adjust the sensitivity of motor stall over-temperature detection.

H0A.33 Motor stall overtemperature detection

Address:	0x0A21		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0: Hide

1: Enable

Description

Defines whether to enable the detection for E630.0 (Motor stall overtemperature protection).

H0A.36 Encoder multi-turn overflow fault selection

Address: 0x0A24

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At once

Value Range:

0: Not hide

1: Hide

Description

Defines whether to hide the encoder multi-turn overflow fault in the absolute position linear mode (H02.01 = 1).

H0A.40 Compensation function selection

Address: 0x0A28

Min.: 0 Unit: -

Max.: 15 Data Type: UInt16

Default: 6 Change: At stop

Value Range:

bit	Name	Function
0	Overtravel compensation	0: Enabled
		1: Disabled
1	Probe rising edge compensation	0: Disabled
		1: Enabled
2	Probe falling edge compensation	0: Disabled
		1: Enabled
3	Probe solution	0: New solution
		1: Old solution (same as SV660N)

Description

-

H0A.41 Forward position of software position limit

Address: 0x0A29

Min.:	-2147483648	Unit:	Encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	2147483647	Change:	At stop

Value Range:

-2147483648 to +2147483647

Description

When the absolute position counter (H0b.07) is larger than H0A.41, the servo drive reports E950.0 (Forward overtravel) and stops accordinly.

H0A.43 Reverse position of software position limit

Address: 0x0A2B

Min.:	-2147483648	Unit:	Encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	-2147483648	Change:	At stop

Value Range:

-2147483648 to +2147483647

Description

When the absolute position counter (H0b.07) is smaller than H0A.43, the servo drive reports E952.0 (Reverse overtravel) and stops accordingly.

H0A.49 Regenerative resistor overtemperature threshold

Address: 0x0A31

Min.:	100	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	140	Change:	Real-time modification

Value Range:

100°C to 175°C

Description

Defines the temperature threshold for regenerative resistor overload.

H0A.50 Encoder communication fault tolerance threshold

Address: 0x0A32

Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	5	Change:	At once

Value Range:

0 to 31

Description

When the numer of communication failures between the encoder and the drive exceeds H0A.50, the communication between the encoder and the drive fails.

H0A.51 Phase loss detection filter times

Address: 0x0A33

Min.:	3	Unit:	55 ms
Max.:	36	Data Type:	UInt16
Default:	20	Change:	At once

Value Range:

3 ms to 36 ms

Description

Phase loss fault is reported when phase loss keeps active for a period longer than that defined by H0A.51.

H0A.52 Encoder temperature protection threshold

Address: 0x0A34

Min.:	0	Unit:	1°C
Max.:	175	Data Type:	UInt16
Default:	125	Change:	Real-time modification

Value Range:

0°C to 175°C

Description

Defines the temperature threshold for encoder overtemperature protection.

H0A.53 Touch probe DI ON-compensation time

Address: 0x0A35

Min.:	-3000	Unit:	25 ns
Max.:	3000	Data Type:	Int16
Default:	200	Change:	At once

Value Range:

-3000 ns to +3000 ns

Description

Used to compensate for the action time when the touch probe is switched on.

H0A.54 Touch probe DI OFF-compensation time

Address: 0x0A36

Min.:	-3000	Unit:	25 ns
Max.:	3000	Data Type:	Int16
Default:	1512	Change:	At once

Value Range:

-3000 ns to +3000 ns

Description

Used to compensate for the action time when the touch probe is switched off.

H0A.55 Runaway current threshold

Address:	0x0A37		
Min.:	100	Unit:	%
Max.:	400	Data Type:	UInt16
Default:	200	Change:	At once

Value Range:

100.0% to 400.0%

Description

Defines the current threshold for runaway protection detection.

H0A.56 Fault reset delay

Address:	0x0A38		
Min.:	0	Unit:	ms
Max.:	60000	Data Type:	UInt16
Default:	10000	Change:	At once

Value Range:

0 ms to 60000 ms

Description

-

H0A.57 Runaway speed threshold

Address:	0x0A39		
Min.:	1	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	50	Change:	At once

Value Range:

1 rpm to 1000 rpm

Description

Defines the overspeed threshold for runaway protection detection.

H0A.58 Runaway speed filter time

Address:	0x0A3A		
Min.:	0.1	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	2	Change:	At once

Value Range:

0.1 ms to 100.0 ms

Description

Defines the speed feedback filter time for runaway protection detection.

H0A.59 Runaway protection detection time

Address: 0x0A3B

Min.:	10	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	30	Change:	At once

Value Range:

10 ms to 1000 ms

Description

The runaway fault will be reported when runaway fault keeps active for a period longer than that defined by H0A.59.

H0A.60 Black box function mode

Address: 0x0A3C

Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:

0: Disable

1: Any fault

2: Designated fault

3: Triggered based on designated condition

Description

Defines the condition for triggering black box sampling.

H0A.61 Designated fault code

Address: 0x0A3D

Min.:	0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0.0 to 6553.5

Description

Defines the fault code for triggering the black box function.

H0A.62 Trigger source

Address: 0x0A3E

Min.:	0	Unit:	-
Max.:	25	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 25

Description

Defines the fault code for triggering the black box function through designated channel.

H0A.63 Trigger level

Address:	0x0A3F		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	At once

Value Range:

-2147483648 to +2147483647

Description

Defines the level for triggering the black box function through designated channel.

H0A.65 Trigger level

Address:	0x0A41		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Rising edge

1: Equal

2: Falling edge

3: Edge-triggered

Description

Defines the mode for triggering the black box function through H0A.63.

H0A.66 Trigger position

Address:	0x0A42		
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	75	Change:	At once

Value Range:

0% to 100%

Description

Defines the pre-trigger position for triggering black box sampling.

H0A.67 Sampling frequency

Address:	0x0A43		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Current loop
1: Position loop
2: Main cycle

Description

Defines the frequency sampling mode during black box sampling.

H0A.70 Overspeed threshold 2

Address:	0x0A46		
Min.:	0	Unit:	rpm
Max.:	20000	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 rpm to 20000 rpm

Description

Defines the speed threshold for reporting E500.2 (Position feedback pulse overspeed).

H0A.71 MS1 motor overload curve switchover

Address:	0x0A47		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	4098	Change:	Real-time modification

Value Range:

0 to 65535

Description

Bit 0:
0: New overload curve
1: Old overload curve
Bit 1:
0: Enable discharging switch upon power failure
1: Hide discharging switch upon power failure
Bit 12:
0: Homing completed flag bit not retentive upon power failure
1: Homing completed flag bit retentive upon power failure

H0A.72 Maximum stop time in ramp-to-stop

Address:	0x0A48		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	At stop

Value Range:

0 to 65535

Description

Defines the time for the motor to decelerate from the maximum speed to 0 rpm during ramp-to-stop.

H0A.73 STO 24V disconnection filter time

Address:	0x0A49		
Min.:	1	Unit:	ms
Max.:	5	Data Type:	UInt16
Default:	5	Change:	At once

Value Range:

1 ms to 5 ms

Description

Defines the delay from the moment when 24 V is disconnected to the moment when the STO state applies.

H0A.74 Filter time for two inconsistent STO channels

Address:	0x0A4A		
Min.:	1	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

1 ms to 1000 ms

Description

Defines the delay from the moment 24 V is inputted to the drive inconsistently through two channels to the moment when the STO state applies.

H0A.75 Servo OFF delay after STO triggered

Address:	0x0A4B		
Min.:	0	Unit:	ms
Max.:	25	Data Type:	UInt16
Default:	20	Change:	At once

Value Range:

0 ms to 25 ms

Description

Defines the delay from the moment the STO state is triggered to the moment the S-ON signal is switched off.

H0A.90 Moving average filter time for speed display values

Address:	0x0A5A		
Min.:	0	Unit:	ms

Max.:	100	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 ms to 100 ms

Description

Defines the moving average filter time constant for speed display values.

H0A.91 Moving average filter time for torque display values

Address: 0x0A5B

Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 ms to 100 ms

Description

Defines the moving average filter time constant for torque display values.

H0A.92 Moving average filter time for position display values

Address: 0x0A5C

Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 ms to 100 ms

Description

Defines the moving average filter time constant for position display values.

H0A.93 Low-pass filter time for voltage display values

Address: 0x0A5D

Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 ms to 250 ms

Description

Defines the low-pass filter time constant for voltage display values.

H0A.94 Low-pass filter time for thermal display values

Address: 0x0A5E

Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16

Default:	0	Change:	At once

Value Range:

0 ms to 250 ms

Description

Defines the filter time constant for thermal display values.

4.12 H0b Monitoring Parameters

H0b.00 Motor speed actual value

Address:	0x0B00		
Min.:	-32767	Unit:	rpm
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767 rpm to +32767 rpm

Description

Indicates the actual motor speed after round-off, which is accurate to 1 rpm. Set in H0A.25 (Filter time constant of speed feedback display) the filter time constant for H0b.00.

H0b.01 Speed reference

Address:	0x0B01		
Min.:	-32767	Unit:	rpm
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767 rpm to +32767 rpm

Description

Indicates the present speed reference (accurate to 1 rpm) of the drive in the position and speed control modes.

H0b.02 Internal torque reference

Address:	0x0B02		
Min.:	-500	Unit:	%
Max.:	500	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-500.0% to +500.0%

Description

Displays present torque reference (accurate to 0.1%). The value 100.0% corresponds to the rated torque of the motor.

H0b.03 Monitored DI status

Address:	0x0B03		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the level status of eight DIs without filtering.

Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0")

H0b.05 Monitored DO status

Address:	0x0B05		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the level status of five DOs without filtering.

Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0")

H0b.07 Absolute position counter

Address:	0x0B07		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Indicates present absolute position (reference unit) of the motor in the position control mode.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0b.09 Mechanical angle

Address:	0x0B09		
Min.:	0	Unit:	°
Max.:	360	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0° to 360.0°

Description

Displays present mechanical angle (encoder unit) of the motor. The setpoint 0 indicates the mechanical angle is 0°.

Actual mechanical angle = 360° x H0b.09/(Maximum value of H0b.09 + 1)

Maximum value of H0b.09 for an absolute encoder: 65535

H0b.10 Electrical angle

Address:	0x0B0A		
Min.:	0	Unit:	°
Max.:	360	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0° to 360.0°

Description

Indicates the present electrical angle of the motor, which is accurate to 0.1°.

The electrical angle variation range is ±360.0° during rotation. If the motor has four pairs of poles, each revolution generates four rounds of angle change from 0° to 359°. Similarly, if the motor has five pairs of poles, each revolution generates five rounds of angle change from 0° to 359°.

H0b.12 Average load rate

Address:	0x0B0C		
Min.:	0	Unit:	%
Max.:	800	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0% to 800.0%

Description

Displays the percentage of the average load torque to the rated torque of the motor, which is accurate to 0.1%. The value 100.0% corresponds to the rated torque of the motor.

H0b.13 Input reference counter

Address:	0x0B0D		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Used to count and display the number of position references not divided or multiplied by the electronic gear ratio during operation. This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0b.15 Position following error (encoder unit)

Address:	0x0B0F		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Used to count and display the position deviation value after being divided or multiplied by the electronic gear ratio in the position control mode.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

Note:

H0b.15 can be cleared when the condition defined in H05.16 (Clear action) is met.

H0b.17 Feedback pulse counter

Address:	0x0B11		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Used to count the position pulses fed back by the encoder in any control mode.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0b.19 Total power-on time

Address:	0x0B13		
Min.:	0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0.0s to 429496729.5s

Description

Used to record the total operating time of the servo drive.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

Note:
If the servo drive is switched on and off repeatedly within a short period of time, a deviation within 1h may be present in the total power-on time record.

H0b.21 AI1 voltage display

Address: 0x0B16

Min.:	-12	Unit:	V
Max.:	12	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-12.000 V to +12.000 V

Description

Displays the actual sampling voltage of AI1.

H0b.24 RMS value of phase current

Address: 0x0B18

Min.:	0	Unit:	A
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 A to 6553.5 A

Description

Displays the RMS value of the phase current of the motor, which is accurate to 0.01 A.

H0b.25 Angle obtained upon voltage injection auto-tuning

Address: 0x0B19

Min.:	0	Unit:	°
Max.:	360	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0° to 360.0°

Description

-

H0b.26 Bus voltage

Address: 0x0B1A

Min.:	0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 V to 6553.5 V

Description

Displays the DC bus voltage of the main circuit input voltage after rectification, which is accurate to 0.01 V.

H0b.27 Module temperature

Address:	0x0B1B		
Min.:	-20	Unit:	°C
Max.:	200	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-20°C to +200°C

Description

Indicates the temperature of the module inside the servo drive, which can be used as a reference for estimating the actual temperature of the drive.

H0b.28 Absolute encoder fault information given by FPGA

Address:	0x0B1C		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.29 Axis status information given by FPGA

Address:	0x0B1D		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.30 Axis fault information given by FPGA

Address:	0x0B1E		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.31 Encoder fault information

Address:	0x0B1F		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

-

H0b.33 Fault log

Address:	0x0B21		
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Present fault

1: Last fault

2: 2nd to last fault

3: 3rd to last fault

4: 4th to last fault

5: 5th to last fault 6: 6th to last fault

7: 7th to last fault

8: 8th to last fault

9: 9th to last fault

10: 10th to last fault

11: 11th to last fault

12: 12th to last fault

13: 13th to last fault

14: 14th to last fault

15: 15th to last fault

16: 16th to last fault

17: 17th to last fault

18: 18th to last fault

19: 19th to last fault

Description

Used to view the lastest 20 faults of the drive.

H0b.34 Fault code of the selected fault

Address: 0x0B22

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.35 Time stamp upon occurrence of the selected fault

Address: 0x0B23

Min.:	0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0.0s to 429496729.5s

Description

-

H0b.37 Motor speed upon occurrence of the selected fault

Address: 0x0B25

Min.:	-32767	Unit:	rpm
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767 rpm to +32767 rpm

Description

-

H0b.38 Motor phase U current upon occurrence of the selected fault

Address: 0x0B26

Min.:	-3276.7	Unit:	A
Max.:	3276.7	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-3276.7 A to +3276.7 A

Description

-

H0b.39 Motor phase V current upon occurrence of the selected fault

Address: 0x0B27

Min.:	-3276.7	Unit:	A
Max.:	3276.7	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-3276.7 A to +3276.7 A

Description

-

H0b.40 Bus voltage upon occurrence of the selected fault

Address: 0x0B28

Min.:	0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 V to 6553.5 V

Description

-

H0b.41 DI status upon occurrence of the selected fault

Address: 0x0B29

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.43 DO status upon occurrence of the selected fault

Address: 0x0B2B

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.45 Internal fault code

Address: 0x0B2D

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

-

H0b.46 Absolute encoder fault information given by FPGA upon occurrence of the selected fault

Address: 0x0B2E

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

-

H0b.47 System status information given by FPGA upon occurrence of the selected fault

Address: 0x0B2F

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

-

H0b.48 System fault information given by FPGA upon occurrence of the selected fault

Address: 0x0B30

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

-

H0b.49 Encoder fault information upon occurrence of the selected fault

Address: 0x0B31

Min.: 0 | Unit: -

Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.51 Internal fault code upon occurrence of the selected fault

Address:	0x0B33		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.52 FPGA timeout fault standard bit upon occurrence of the selected fault

Address:	0x0B34		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.53 Position following error (reference unit)

Address:	0x0B35		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Indicates the position deviation value which has not been divided or multiplied by the electronic gear ratio in the position control mode.

Position deviation (reference unit) is the value obtained after enoder position deviation calculation. The precision is compromised during division.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0b.55 Motor speed actual value

Address:	0x0B37		
Min.:	-2147483648	Unit:	rpm
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 rpm to +2147483647 rpm

Description

Indicates the actual value of motor speed, which is accurate to 0.1 rpm.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0A.25 (Filter time constant of speed feedback display) can be used to set the filter time constant of the speed feedback.

H0b.57 Bus voltage of the control circuit

Address:	0x0B39		
Min.:	0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.0 V to 6553.5 V

Description

Displays the bus voltage of the control circuit.

H0b.58 Mechanical absolute position (low 32 bits)

Address:	0x0B3A		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the low 32-bit value (encoder unit) of the mechanical position feedback when the absolute encoder is used.

H0b.60 Mechanical absolute position (high 32 bits)

Address:	0x0B3C		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the high 32-bit value (encoder unit) of the mechanical position feedback when the absolute encoder is used.

H0b.63 NotRdy state

Address:	0x0B3F		
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

1: Control circuit error

2: Main circuit power input error

3: Bus undervoltage

4: Soft start failed

5: Encoder initialization undone

6: Short circuit to ground failed

7: Others

Description

Displays the reason for NotRdy state.

H0b.64 Real-time input position reference counter

Address:	0x0B40		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to +2147483647

Description

Displays the value of the pulse reference counter before being divided or multiplied by the electronic gear ratio. This value is independent of the servo drive status and the control mode.

H0b.66 Encoder temperature

Address:	0x0B42		
Min.:	-32768	Unit:	°C
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32768°C to 32767°C

Description

-

H0b.67 Load rate of regenerative resistor

Address: 0x0B43
Min.: 0 Unit: %
Max.: 200 Data Type: UInt16
Default: 0 Change: Unchangeable

Value Range:

0.0% to 200.0%

Description

-

H0b.70 Number of absolute encoder revolutions

Address: 0x0B46
Min.: 0 Unit: Rev
Max.: 65535 Data Type: UInt16
Default: 0 Change: Unchangeable

Value Range:

0 Rev to 65535 Rev

Description

Indicates the number of revolutions of the absolute encoder.

H0b.71 Single-turn position fed back by the absolute encoder

Address: 0x0B47
Min.: 2147483648 Unit: p
Max.: 2147483647 Data Type: UInt32
Default: 0 Change: Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the position feedback of the absolute encoder within one turn.

H0b.74 System fault information given by FPGA

Address: 0x0B4A
Min.: 0 Unit: -
Max.: 65535 Data Type: UInt16
Default: 0 Change: Unchangeable

Value Range:

0 to 65535

Description

-

H0b.77 Encoder position (low 32 bits)

Address: 0x0B4D

Min.: -2147483648 Unit: p
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the low 32-bit value of the position feedback of the absolute encoder.

H0b.79 Encoder position (high 32 bits)

Address: 0x0B4F
Min.: -2147483648 Unit: p
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the high 32-bit value of the position feedback of the absolute encoder.

H0b.81 Single-turn position of the rotary load (low 32 bits)

Address: 0x0B51
Min.: -2147483648 Unit: p
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the low 32-bit value of the position feedback of the rotary load when the absolute system works in the rotation mode.

H0b.83 Single-turn position of the rotary load (high 32 bits)

Address: 0x0B53
Min.: -2147483648 Unit: p
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the high 32-bit value of the position feedback of the rotary load when the absolute system works the rotation mode.

H0b.85 Single-turn position of the rotary load (reference unit)

Address:	0x0B55		
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 p to +2147483647 p

Description

Displays the high 32-bit value of the position feedback of the rotary load when the absolute system works the rotation mode.

H0b.87 IGBT junction temperature

Address:	0x0B57		
Min.:	0	Unit:	-
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 200

Description

-

H0b.90 Group No. of the abnormal parameter

Address:	0x0B5A		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.91 Offset of the abnormal parameter within the group

Address:	0x0B5B		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0b.93 Closed loop state

Address:	0x0B5D	Effective Time:	-
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0: Half closed loop

1: Fully closed loop

Description

Displays the closed loop state in position control mode.

H0b.94 Individual power-on time

Address:	0x0B5E		
Min.:	0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0.0s to 429496729.5s

Description

Display the individual power-on time of the drive.

H0b.96 Individual power-on time upon occurrence of the selected fault

Address:	0x0B60		
Min.:	0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0.0s to 429496729.5s

Description

-

4.13 H0d Auxiliary Parameters

H0d.00 Software reset

Address:	0x0D00		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Enable

Description

Programs in the drive are reset automatically (similar to the program reset upon power-on) after the software reset function is enabled, without the need for a power cycle.

H0d.01 Fault reset

Address: 0x0D01

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Enable

Description

When a No. 1 or No. 2 resettable fault occurs, you can enable the fault reset function in the non-operational state after rectifying the fault cause, stopping the keypad from displaying the fault and allowing the drive to enter the "rdy" state. When a No. 3 warning occurs, you can enable the fault reset function directly.

H0d.02 Inertia auto-tuning selection

Address: 0x0D02

Min.:	0	Unit:	-
Max.:	65	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65

Description

Used to enable offline inertia auto-tuning through the keypad. In the parameter display mode, switch to H0d.02 and press the SET key to enable offline inertia auto-tuning.

H0d.04 Read/write in encoder ROM

Address: 0x0D04

Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation
1: Write ROM
2: Read ROM
3: ROM failure

Description

-

H0d.05 Emergency stop

Address:	0x0D05		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: No operation
1: Emergency stop

Description

-

H0d.10 Auto-tuning of analog channel

Address:	0x0D0A		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation
1: Adjust AI1

Description

When automatic adjustment of the analog channel is enabled, the drive automatically corrects the zero drift voltage of the analog channel to improve signal detection accuracy.

H0d.12 Phase U/V current balance correction

Address:	0x0D0C		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disable
1: Enable

Description

-

H0d.17 Forced DI/DO enable switch

Address:	0x0D11		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

bit 0: Forced DI enable switch

0: Disable

1: Enable

bit 1: Forced DO enable switch

0: Disable

1: Enable

Description

Defines whether to enable forced DI/DO.

H0d.18 Forced DI value

Address:	0x0D12		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	At once

Value Range:

0 to 255

Description

Defines the level logic of the DI functions set in group H03 when forced DI is active (H0d.17 = 1 or 3).

The value of H0d.18 is displayed as a hexadecimal on the keypad. When it is converted to a binary value, "bit(n) = 1" indicates the level logic of DI function is high level; "bit(n) = 0" indicates the level logic of the DI function is low level.

H0d.19 Forced DO value

Address:	0x0D13		
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 31

Description

Defines whether the DO functions assigned in group H04 are active when forced DO is active (H0d.17 = 2 or 3).

The value of H0d.19 is displayed as a hexadecimal on the keypad. When it is converted to a binary value, "bit(n) = 1" indicates the DO function is active; "bit(n) = 0" indicates the DO function is inactive.

H0d.20 Absolute encoder reset selection

Address:	0x0D14		
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Reset the fault

2: Reset the fault and multi-turn data

3: Reset Inovance 2nd encoder fault

4: Reset Inovance 2nd encoder fault and multi-turn data

Description

You can reset the encoder fault or the multi-turn data fed back by the encoder by setting H0d.20.

H0d.23 Torque fluctuation auto-tuning

Address:	0x0D17		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 1

Description

-

H0d.26 Brake and dynamic brake started forcibly

Address:	0x0D1A		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No forcible operations

1: Dynamic brake deactivated forcibly

2: Brake released forcibly

3: Dynamic brake deactivated and brake released forcibly

Description

-

4.14 H0E Communication Function Parameters

H0E.00 **Node address**

Address:	0x0E00		
Min.:	1	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 127

Description

Indicates the slave node address. Ensure this parameter is consistent with the configuration of the host controller.

H0E.01 **Save objects written through communication to EEPROM**

Address:	0x0E01		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

0: Not save

1: Save parameters

2: Save object dictionaries3: Save parameters and object dictionaries

4: Save object dictionaries written before communication (OP)

255: Determine through H0E03 and H0E04

Description

-

H0E.03 **Save objects written through software (commissioning protocol) to e2prom**

Address:	0x0E03	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

0: Do not save

1: Save

Description

Saves objects written through software (commissioning protocol) to e2prom, including the parameter and object dictionary.

H0E.04 Save objects written through communication to e2prom (excluding commissioning protocol)

Address:	0x0E04	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Do not save

1: Save

Description

You can use this parameter to determine whether to save communication written data in e2prom (excluding commissioning protocol) (CANOpen, CANLink, Ethernet COE, ModBus485). The data include the function code and object dictionary

H0E.10 CAN selection

Address:	0x0E0A		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Pulse/Axis control command

1: Enhanced axis control command

Description

Indicates the CAN application layer:

0: Pulse/Axis control command

1: Enhanced axis control command

H0E.11 CAN baud rate

Address:	0x0E0B		
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	5	Change:	At stop

Value Range:

0: 20 kbit/s

1: 50 kbit/s

2: 100 kbit/s

3: 125 kbit/s

4: 250 kbit/s

5: 500 kbit/s

7: 1 Mbps

Description

It sets the CAN (CANlink or CANopen) communication rate between the servo drive and the host controller. The communication rate set in the servo drive must be the same as that in the host controller. Otherwise, communication will fail. If H0E.11 is set to 6, the baud rate is 1 Mbps.

H0E.80 Modbus baud rate

Address:	0x0E50		
Min.:	0	Unit:	-
Max.:	9	Data Type:	UInt16
Default:	9	Change:	At once

Value Range:

0: 300 bps
1: 600 bps
2: 1200 bps
3: 2400 bps
4: 4800 bps
5: 9600 bps
6: 19200 bps
7: 38400 bps
8: 57600 bps
9: 115200 bps

Description

Defines the communication rate between the servo drive and the host controller. The baud rate set in the servo drive must be the same as that in the host controller. Otherwise, communication will fail.

H0E.81 Modbus data format

Address:	0x0E51		
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	3	Change:	At once

Value Range:

0: No parity, 2 stop bits (N-2)
1: Even parity, 1 stop bit (E-1)
2: Odd parity, 1 stop bit (O-1)
3: No parity, 1 stop bit (N-1)

Description

Defines the data check mode between the servo drive and the host controller during communication.
0: No parity, 2 stop bits
1: Even parity, 1 stop bit
2: Odd parity, 1 stop bit
3: No parity, 1 stop bit
The data format of the servo drive must be the same as that of the host controller. Otherwise, communication will fail.

H0E.82 Modbus response delay

Address: 0x0E52

Min.:	0	Unit:	ms
Max.:	20	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:
0 ms to 20 ms
Description
Defines the delay from the moment the slave receives a command to the moment the slave returns a response.

H0E.83 Modbus communication timeout

Address: 0x0E53

Min.:	0	Unit:	ms
Max.:	600	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:
0 ms to 600 ms
Description
-

H0E.84 Modbus communication data sequence

Address: 0x0E54

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:
0: High bits before low bits
1: Low bits before high bits
Description
Defines the 32-bit data transmission format of Modbus communication.
0: High 16 bits before low 16 bits
1: Low 16 bits before high 16 bits

H0E.90 Modbus version

Address:	0x0E5A		
Min.:	0	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

-

H0E.92 CANlink version

Address:	0x0E5C		
Min.:	0	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

-

Description

-

H0E.97 Communication monitoring parameter 1

Address:	0x0E61		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

-

H0E.98 Communication monitoring parameter 2

Address:	0x0E62		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

-

4.15 H0F Fully Closed-Loop Parameters

H0F.00 Encoder feedback mode

Address: 0x0F00

Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Internal encoder feedback

1: External encoder feedback

2: Inner/Outer loop switchover

Description

Defines the encoder feedback signal source in fully closed-loop control.

0: Internal encoder feedback: The position feedback signals come from the motor encoder.

1: External encoder feedback: The position feedback signals come from the fully closed-loop external encoder and electronic gear ratio 1 is used.

2: Inner/Outer loop switchover: The DI assigned with FunIN.24 (GEAR_SEL, electronic gear ratio switchover) is switch between inner and outer position closed loops. FunIN.24

: Inactive, internal encoder feedback, with electronic gear ratio 1 used

Active: External encoder feedback, with electronic gear ratio 2 used

H0F.01 External encoder operation mode

Address: 0x0F01

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Standard operating direction

1: Reverse operating direction

Description

Defines the feedback pulse counting direction of internal and external encoders when the motor rotates in the fully closed-loop mode.

0: Standard operating direction: The pulse feedback counter of the internal encoder (H0F.18) is in the same direction as that of the external encoder (H0F.20) during rotation of the motor.

1: Reverse operating direction: The counting direction of pulse feedback counter of the internal encoder (H0F.18) is opposite to the external encoder (H0F.20) during rotation of the motor.

H0F.02 External encoder mode

Address: 0x0F02

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Incremental mode

1: Absolute linear mode

Description

H0F.03 External encoder feedback type

Address: 0x0F03

Min.:	0	Unit:	-
Max.:	0	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Quadrature pulse

Description

H0F.04 External encoder pulses per revolution

Address:

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	10000	Change:	At stop

Value Range:

0 to 2147483647

Description

Defines the pulses fed back by the external encoder per revolution of the motor. It defines the quantity relationship between feedback pulses from the external encoder and those from the internal encoder.

Calculate the value of this parameter through analyzing mechanical parameters. When rigid connection is applied between the motor and the external encoder (scale), you can also set this parameter using the following method:

1. Manually rotate the motor and observe H0F.18 (Feedback pulse counter of internal encoder) in the meantime. After ensuring that the motor has rotated for a full turn (H0F.18 = Motor resolution), calculate the change of H0F.20 (Feedback pulse counter of external encoder) and use the absolute value of the change as the value of H0F.04.
2. Assume values of H0F.18 and H0F.20 are X1 and Y1 before the motor rotates and X2 and Y2 after the motor rotates, then the following formula applies: H0F.04 = Motor resolution x (Y2 - Y1)/(X2 - X1) The calculated result must be positive; if not, perform step 1 again.
For non-rigid connection, an error may exist in the calculation result.
Note:
Ensure H0F.04 is set properly. Otherwise, EB02.0 (Position deviation too large in fully closed loop) may occur after the drive operates.

H0F.08 Excessive deviation threshold in compound control mode

Address:	0x0F08		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1000	Change:	At once

Value Range:
0 to 2147483647
Description
Defines the position deviation threshold at which the servo drive reports EB02.0 (Position deviation too large in fully closed-loop mode).
When H0F.08 is set to 0, the drive does not detect EB02.0 and always clears the fully closed-loop position deviation.

H0F.10 Clear deviation in compound control mode

Address:	0x0F0A		
Min.:	0	Unit:	R
Max.:	100	Data Type:	UInt16
Default:	1	Change:	At once

Value Range:
0 R to 100 R
Description
Defines the number of revolutions rotated by the motor per clear of the fully closed-loop position deviation during operation. The number of revolutions is reflected by H0F.18 (Feedback pulse counter of internal encoder). The number of motor revolutions will not be cleared when the drive is in the non-oeprational state.

H0F.13 Compound vibration suppression filter time

Address:	0x0F0D		
Min.:	0	Unit:	ms
Max.:	6553.5	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0.0 ms to 6553.5 ms

Description

Defines the time constant for compound vibration suppression in fully closed-loop control when external encoder feedback (H0F.00 = 1 or 2) is used.

Increase the setpoint gradually and check the change in the response.

When the stiffness of the transmission mechanism between fully closed loop and internal loop is insufficient, set H0F.13 properly to improve system stability, which is to generate the effect of internal loop temporarily and form a fully closed loop again after the system is stabilized. When the stiffness is sufficient, there is no need to adjust this parameter.

H0F.16 Pulse deviation display in compound control mode

Address:	0x0F10		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to +2147483647

Description

Used to count and display the position deviation absolute value in fully closed loop control.

Pulse deviation in compound control = Absolute position feedback of external encoder - Absolute position feedback conversion value of internal encoder

H0F.18 Internal position pulse feedback display

Address:	0x0F12		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to +2147483647

Description

Used to count and display the number of feedback pulses of the internal encoder (after being divided or multiplied by electronic gear ratio, in internal encoder unit).

H0F.20 **External position pulse feedback display**

Address:	0x0F14		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to +2147483647

Description

Used to count and display the number of feedback pulses of the external encoder (after being divided or multiplied by electronic gear ratio, in external encoder unit).

H0F.22 **External encoder phase Z detection invalid (quadrature pulse feedback)**

Address:	0x0F16		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Detected

1: Not detected

Description

H0F.25 **Source of touch probe Z signal in fully closed-loop mode**

Address:	0x0F19		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Motor Z signal

1: External feedback Z signal

Description

-

H0F.45 **Positioning completed/Position deviation threshold in fully closed-loop mode**

Address:	0x0F2D		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Threshold scaled to outer loop unit

1: Same threshold used for inner and outer loops

Description

0: H05.21 or 6067h/H0A.10 or 6065h (scaled to outer loop unit)

1: Same threshold used for inner and outer loops

H0F.46 Fully closed-loop speed feedback selection

Address:	0x0F2E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Internal encoder feedback

1: External encoder feedback

Description

4.16 H11 Multi-position Parameters

H11.00 Multi-position operation mode

Address:	0x1100		
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Single run (number of displacements selected in H11.01)

1: Cyclic operation (number of displacement selected in H11.01)

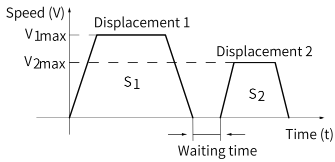
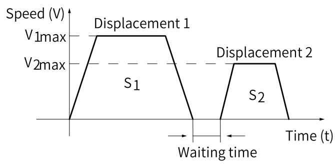
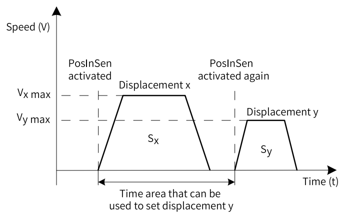
2: DI-based operation (selected by DI)

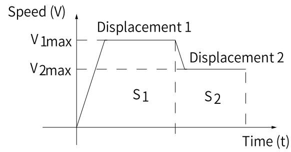
3: Sequential operation

5: Axis-controlled continuous operation

Description

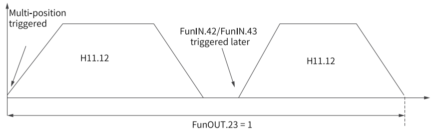
Defines the multi-position operation mode when the main position reference source is multi-position references (H05.00 = 2) in the position control mode.

Set point	Operation Mode	Remarks	Operation Curve
0	Individual operation	The drive stops after one cycle of operation. The drive automatically switches to the next speed. You can set the interval time between displacements. The multi-position reference is level-triggered.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2 S_1 , S_2 : displacement 1 and displacement 2
1	Cyclic operation	The starting displacement after the first cycle is displacement 1. The drive automatically switches to the next speed. You can set the interval time between displacements. The multi-position reference is level-triggered.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2 S_1 , S_2 : displacement 1 and displacement 2
2	DI-based operation	The drive continues operating when the displacement No. is updated. The speed No. is determined by the DI logic. The interval time between displacements is determined by the command delay of the host controller. The multi-position reference is edge-triggered.	 V_{xmax} , V_{ymax} : maximum operating speeds in displacement x and displacement y S_x , S_y : displacement x and displacement y

Set point	Operation Mode	Remarks	Operation Curve
3	Sequential operation	The drive stops after one cycle of operation. The starting displacement after the first cycle is defined by H11.05. The drive automatically switches to the next speed. There is no interval time between displacements. The multi-position reference is level-triggered.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2 S_1 , S_2 : displacement 1 and displacement 2

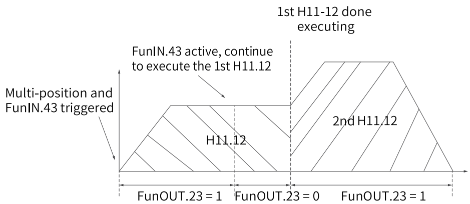
<table>
<tr><th>Set point</th><th>Operation Mode</th><th>Remarks</th><th>Operation Curve</th></tr>
<tr><td>5</td><td>Axis-controlled continuous operation</td><td>The drives executes one displacement only.
The individual operation mode, sequential operation mode, and interrupted operation mode are included.
The PoslnSen (multi-position reference enable) signal is level-triggered.</td><td>

• Individual operation



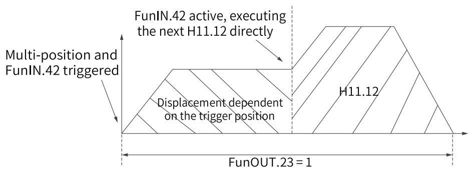
The PoslnSen (multi-position reference enable) signal is triggered only once (FunIN.43/42 triggered later). The drive stops after executing the distance defined by H11.12.

• Sequential operation



The PoslnSen (multi-position reference enable) signal is triggered only once. Write H11.12 again and activate FunIN.43 when the distance defined by the first H11.12 is still in progress.After receiving the new distance (or speed), which is the second H11.12, the drive continues executing the first H11.12 until the distance defined by the first H11.12 is done. Then it starts to execute the second H11.12 directly. The travel distance therefore is the sum of the first H11.12 and the second H11.12.

• Interrupted operation



The PoslnSen (Multi-position reference enable) signal is triggered only once. Write H11.12 (such as 1000000) again and activate FunIN.42 when the first H11.12 (such as 9000000) is still in progress. After receiving the new distance (or speed), which is the second H11.12, the drive stops executing the first H11.12 and turns to executing the second H11.12.

</td></tr>
</table>

To use the multi-position function, assign FunIN.28 (PosInSen, multi-position reference enable) to a DI first. See "Group H03: Terminal input parameters" for the setting mode.

The positioning completed (COIN) signal is activated each time upon completion of a displacement. To determine whether a certain displacement is done executing, use FunOUT.5 (COIN, positioning completed). See "Group H04: Terminal output parameters" for details.

Ensure the S-ON signal is active during operation of each displacement. Otherwise, the drive stops immediately as defined by H02.05 (Stop mode at S-ON OFF) and the positioning completed (COIN) signal in inactive. In modes other than DI-based operation, if the S-ON signal is active but multi-position is disabled during operation of a certain displacement, the drive abandons the unsent displacement reference and stops, with the positioning completed (COIN) signal being active. If the multi-position function is enabled again, the displacement to be executed is defined by H11.02.

H11.01 Number of displacement references in multi-position mode

Address: 0x1101

Min.:	1	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 16

Description

Defines the total number of displacement references in the multi-position mode. You can set different displacements, operating speeds, and acceleration/ deceleration time for each displacement.

H11.00 ≠ 2: Displacements are switched automatically in a sequence from 1, 2... H11.01.

H11.00 = 2: Assign four DIs (hardware DI or VDI) with DI functions 6 to 9 (FunIN.6: CMD1 to FunIN.9: CMD4) and control the DI logic through the host controller to switch between different displacements. The displacement No. is a 4-bit binary value. Bit 0...bit 3 correspond to CMD1...CMD4.

The displacement No. is a 4-bit binary value. The relationship between the displacement numbers and CMD1...CMD4 is shown in the following table.

FunIN.9	FunIN.8	FunIN.7	FunIN.6	Displacemetn No.
CMD4	CMD3	CMD2	CMD1	
0	0	0	0	1
0	0	0	1	2
...				
1	1	1	1	16

H11.02 Starting displacement No. after pause

Address: 0x1102

Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16

Default: 0 Change: At stop

Value Range:

0: Continue to execute the unexecuted displacements

1: Start from displacement 1

Description

Defines the starting displacement No. when the multi-position operation recovers from a pause.

Pause:

① The servo drive switches to another control mode or the interrupt positioning function is enabled during multi-position operation.

② The internal multi-position enable signal (FunIN.28:PosInSen) changes from "active" to "inactive".

0: Continue to execute the unexecuted displacements: For example, if H11.01 is set to 16 and the drive pauses at displacement 2, after the drive recovers from the pause, it will start from displacement 3.

1: Start from displacement 1: For example, if H11.01 is set to 16 and the drive pauses at displacement 2, after the drive recovers from the pause, it will start from displacement 1.

H11.03 Interval time unit

Address: 0x1103

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At stop

Value Range:

0: ms

1: s

Description

Defines the unit of acceleration/deceleration time and the interval time during multi-position operation.

Acceleration/Deceleration time: time for the motor to change from 0 rpm to 1000 rpm at a constant speed.

Interval time: interval time that starts from the end of the last reference to the beginning of the next reference

H11.04 Displacement reference type

Address: 0x1104

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At once

Value Range:

0: Relative displacement reference
1: Absolute displacement reference

Description

Relative displacement: position increment of the target position relative to the current motor position

Absolute displacement: position increment of the target position relative to the motor home.

H11.05 Starting displacement No. in sequential operation

Address:	0x1105		
Min.:	0	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 16

Description

Defines whether to perform cyclic operation and the starting displacement No. after the first cycle of operation in the sequential operation mode (H11.00 = 3).

0: The drive executes the displacements defined by H11.01 only once and then stops. The motor is in the locked state.

1–16: The drive operates cyclically, with the starting displacement No. defined by H11.05 after the first cycle of operation. The value of H11.05 should be lower than or equal to H11.01.

H11.09 Deceleration upon axis control OFF

Address:	0x1109		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	65535	Change:	At once

Value Range:

0 ms to 65535 ms

Description

-

H11.10 Starting speed of displacement 1

Address:	0x110A		
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

-

H11.11 Stop speed of displacement 1

Address: 0x110B

Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 rpm to 10000 rpm

Description

-

H11.12 Displacement 1

Address: 0x110C

Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

Defines displacement 1 (reference unit) in multi-position operation.

H11.14 Maximum speed of displacement 1

Address: 0x110E

Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

Defines the maximum speed of displacement 1 in multi-position operation.

The maximum speed is the average operating speed when the motor is not in the acceleration/deceleration process. If H11.12 is set to a too low value, the actual motor speed will be lower than H11.14.

H11.15 Acceleration/Deceleration time of displacement 1

Address: 0x110F

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms to 65535 ms

Description

Defines the time for the motor to change from 0 rpm 1000 rpm at a constant speed during displacement 1.

Actual time needed for accelerating to H11.14 (Max. speed of displacement 1):

$$t = \frac{(H11.14) \times (H11.15)}{1000}$$

Note: Ensure the stiffness is proper and the speed loop follows the position reference.

H11.16 Interval time after displacement 1

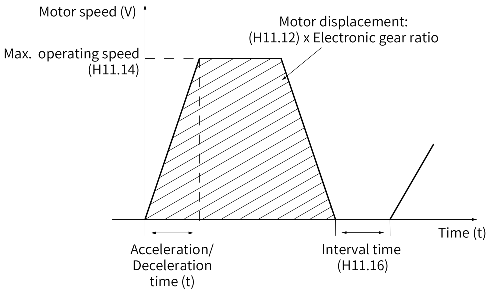
Address:	0x1110		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

Defines the interval time that starts from the end of displacement 1 to the beginning of the next displacement.



H11.17 Displacement 2

Address:	0x1111		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.19 Max. speed of displacement 2

Address: 0x1113

Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

H11.20 Acceleration/Deceleration time of displacement 2

Address: 0x1114

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.21 Interval time after displacement 2

Address: 0x1115

Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.22 Displacement 3

Address: 0x1116

Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.24 Max. speed of displacement 3

Address:	0x1118		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.25 Acceleration/Deceleration time of displacement 3

Address:	0x1119		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.26 Interval time after displacement 3

Address:	0x111A		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.27 Displacement 4

Address:	0x111B		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.29 Max. speed of displacement 4

Address:	0x111D		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.30 Acceleration/Deceleration time of displacement 4

Address:	0x111E		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.31 Interval time after displacement 4

Address:	0x111F		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.32 Displacement 5

Address:	0x1120		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.34 Maximum speed of displacement 5

Address:	0x1122		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.35 Acceleration/Deceleration time of displacement 5

Address:	0x1123		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.36 Interval time after displacement 5

Address:	0x1124		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.37 Displacement 6

Address:	0x1125		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.39 Max. speed of displacement 6

Address: 0x1127

Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.40 Acceleration/Deceleration time of displacement 6

Address: 0x1128

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.41 Interval time after displacement 6

Address: 0x1129

Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.42 Displacement 7

Address: 0x112A

Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.44 **Max. speed of displacement 7**

Address:	0x112C		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.45 **Acceleration/Deceleration time of displacement 7**

Address:	0x112D		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.46 **Interval time after displacement 7**

Address:	0x112E		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.47 **Displacement 8**

Address:	0x112C		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.49 Max. speed of displacement 8

Address: 0x1131

Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.50 Acceleration/Deceleration time of displacement 8

Address: 0x1132

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.51 Interval time after displacement 8

Address: 0x1133

Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.52 Displacement 9

Address: 0x1134

Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.54 Max. speed of displacement 9

Address: 0x1136

Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.55 Acceleration/Deceleration time of displacement 9

Address: 0x1137

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.56 Interval time after displacement 9

Address: 0x1138

Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.57 Displacement 10

Address:

Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.59 Max. speed of displacement 10

Address:	0x113B		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.60 Acceleration/Deceleration time of displacement 10

Address:	0x113C		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.61 Interval time after displacement 10

Address:	0x113D		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.62 Displacement 11

Address:	0x113E		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.64 Max. speed of displacement 11

Address: 0x1140

Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.65 Acceleration/Deceleration time of displacement 11

Address: 0x1141

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.66 Interval time after displacement 11

Address: 0x1142

Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.67 Displacement 12

Address: 0x1143

Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.69 **Max. speed of displacement 12**

Address:	0x1145		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.70 **Acceleration/Deceleration time of displacement 12**

Address:	0x1146		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.71 **Interval time after displacement 12**

Address:	0x1147		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.72 **Displacement 13**

Address:	0x1148		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.74 Max. speed of displacement 13

Address:	0x114A		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.75 Acceleration/Deceleration time of displacement 13

Address:	0x114B		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.76 Interval time after displacement 13

Address:	0x114C		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.77 Displacement 14

Address:	0x114D		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.79 Max. speed of displacement 14

Address:	0x114F		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.80 Acceleration/Deceleration time of displacement 14

Address:	0x1150		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.81 Interval time after displacement 14

Address:	0x1151		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.82 Displacement 15

Address:	0x1152		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.84 Max. speed of displacement 15

Address:	0x1154		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.85 Acceleration/Deceleration time of displacement 15

Address:	0x1155		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.86 Interval time after displacement 15

Address:	0x1156		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.87 Displacement 16

Address:	0x1157		
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	At once

Value Range:

-1073741824 to +1073741824

Description

-

H11.89 Max. speed of displacement 16

Address:	0x1159		
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Real-time modification

Value Range:

1 rpm to 10000 rpm

Description

-

H11.90 Acceleration/Deceleration time of displacement 16

Address:	0x115A		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 65535

Description

-

H11.91 Interval time after displacement 16

Address:	0x115B		
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

4.17 H12 Multi-Speed Parameters

H12.00 Multi-speed operation mode

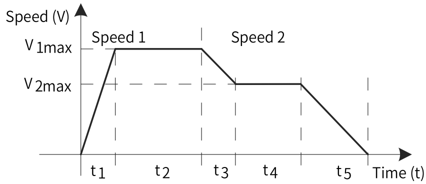
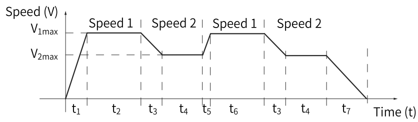
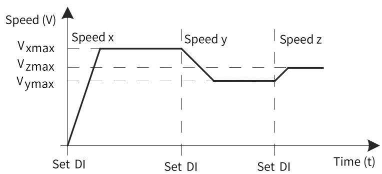
Address:	0x1200		
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Stop after running for one cycle (number of speeds defined by H12.01)
1: Cyclic operation (number of speeds defined by H12.01)
2: DI-based operation

Description

Defines the multi-speed operation mode when the speed reference source is multi-speed reference (H06.01 = 5, H06.02 = 1/2/3) in the speed control mode. The S-ON signal must be active during operation of each speed. Otherwise, the drive stops immediately as defined by H02.05 (Stop mode at S-ON OFF). The speed reach signal (FunOUT.19: V-Arr) is activated each time when a speed reference value is reached.

Set point	Operation Mode	Remarks	Operation Curve
0	Individual operation	The drive stops after one cycle of operation. The drive switches to the next displacement automatically.	 V_{1max} , V_{2max} : reference values of speed 1 and speed 2 t_1 : actual acceleration/deceleration time of speed 1 t_3 , t_5 : acceleration/deceleration time of speed 2
1	Cyclic operation	The drive starts from speed 1 after each cycle of operation. The drive automatically switches to the next speed. The cyclic operation state remains active as long as the S-ON signal is active.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2
2	External DI signal	The drive operates continuously as long as the S-ON signal is active. The speed No. is determined by the DI logic. The operating time of each speed is determined only by the interval time of speed switchover. The speed reference direction can be switched through FunIN.5 (DIR-SEL).	 x, y: speed No. (The relationship between the speed No. and the DI logic is described below.) V_x , V_y: speed references for speeds x and y The speed No. determined by DI does not change, which means the speed reference operates continuously regardless of the reference operating time.

H12.01 Number of speed references in multi-speed mode

Address: 0x1201

Min.: 1
Max.: 16
Default: 16

Unit: -
Data Type: UInt16
Change: At stop

Value Range:

1 to 16

Description

Defines the total number of speed references in the multi-speed mode. Different speed references, operating time, and acceleration/deceleration time (four groups optional) can be set for each speed.

H12.00 ≠ 2: Speeds are switched automatically in a sequence from 1, 2...H12.01.

H12.00 is 2: Assign four DIs (Hardware DI or VDI) with DI functions 6 to 9 (FunIN.6: CMD1 to FunIN.9: CMD4) and control the DI logic through the host controller to switch between different speeds. The displacement No. is a 4-bit binary value. Bit 0 to bit 3 correspond to CMD1 to CMD4.

FunIN.9	FunIN.8	FunIN.7	FunIN.6	Segment No.
CMD4	CMD3	CMD2	CMD1	
0	0	0	0	1
0	0	0	1	2
...				
1	1	1	1	16

The value of CMD(n) is 1 upon active DI logic and 0 upon inactive DI logic.

H12.02 Operating time unit

Address: 0x1202
Min.: 0
Max.: 1
Default: 0

Unit: -
Data Type: UInt16
Change: At stop

Value Range:

0: s

1: min

Description

Defines the time unit of multi-speed operation.

0: s;

1: min

H12.03 Acceleration time 1

Address: 0x1203
Min.: 0
Max.: 65535
Default: 10

Unit: ms
Data Type: UInt16
Change: Real-time modification

Value Range:
0 ms to 65535 ms
Description
Four groups of acceleration/deceleration time can be set for each speed reference.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.04 Deceleration time 1

Address:	0x1204		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	Real-time modification

Value Range:
0 ms to 65535 ms
Description
Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.05 Acceleration time 2

Address:	0x1205		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Real-time modification

Value Range:
0 ms to 65535 ms
Description
Four groups of acceleration/deceleration time can be set for each speed reference.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.06 Deceleration time 2

Address:	0x1206		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Real-time modification

Value Range:
0 ms to 65535 ms
Description

Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.07 Acceleration time 3

Address:	0x1207		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	100	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.08 Deceleration time 3

Address:	0x1208		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	100	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.09 Acceleration time 4

Address:	0x1209		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	150	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.10 Deceleration time 4

Address:	0x120A		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	150	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.20 1st speed reference

Address:	0x1214		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	0	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.21 Operating time of speed 1

Address:	0x1215		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

Defines the operating time of speed 1.

The operating time is the sum of the speed variation time from previous speed reference to present speed reference plus the average operating time of present speed reference.

If the operating time is set to 0, the drive skips this speed reference automatically. As long as H12.00 (Multi-speed operation mode) is set to 2 (DI-based operation) and the speed No. determined by the external DI does not change, the drive continues operating at the speed defined by this speed reference, without being affected by the reference operating time.

H12.22 1st speed rise/drop and curve smoothing parameter time

Address:	0x1216	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Real-time modification

Value Range:

bit0-bit7: Speed rise and drop time
0: Zero acc and dec time
1: Acc and dec time 1
2: Acc and dec time 2
3: Acc and dec time 3
4: Acc and dec time 4
bit8-bit15: S curve smoothing parameter
1: Smoothing parameter 1
2: Smoothing parameter 2
3: Smoothing parameter 3
4: Smoothing parameter 4
5: Smoothing parameter 5
6: Smoothing parameter 6
7: Smoothing parameter 7
8: Smoothing parameter 8

Description

Table 4–5 Selects the acceleration/deceleration time of speed 1.

Set point	Meaning	Description
0	Zero acceleration/ deceleration time	Acceleration time: 0 Deceleration time: 0
1	Acceleration/ Deceleration time 1	Acceleration time: H12.03 Deceleration time: H12.04
2	Acceleration/ Deceleration time 2	Acceleration time: H12.05 Deceleration time: H12.06

Set point	Meaning	Description
3	Acceleration/ Deceleration time 3	Acceleration time: H12.07 Deceleration time: H12.08
4	Acceleration/ Deceleration time 4	Acceleration time: H12.09 Deceleration time: H12.10

Table 4–6 S curve smoothing parameter

Set point	Meaning	Description
1	Smoothing parameter 1	Increasing acceleration time at acceleration segment: H06.51 Decreasing acceleration time at acceleration segment: H06.52 Decreasing deceleration time at deceleration segment: H06.53 Decreasing acceleration time at acceleration segment: H06.54
2	Smoothing parameter 2	Increasing acceleration time at acceleration segment: H06.55 Decreasing acceleration time at acceleration segment: H06.56 Decreasing deceleration time at deceleration segment: H06.57 Decreasing acceleration time at acceleration segment: H06.58
3	Smoothing parameter 3	Increasing acceleration time at acceleration segment: H06.59 Decreasing acceleration time at acceleration segment: H06.60 Decreasing deceleration time at deceleration segment: H06.61 Decreasing acceleration time at acceleration segment: H06.62
4	Smoothing parameter 4	Increasing acceleration time at acceleration segment: H06.63 Decreasing acceleration time at acceleration segment: H06.64 Decreasing deceleration time at deceleration segment: H06.65 Decreasing acceleration time at acceleration segment: H06.66

Set point	Meaning	Description
5	Smoothing parameter 5	Increasing acceleration time at acceleration segment: H06.67 Decreasing acceleration time at acceleration segment: H06.68 Decreasing deceleration time at deceleration segment: H06.69 Decreasing acceleration time at acceleration segment: H06.70
6	Smoothing parameter 6	Increasing acceleration time at acceleration segment: H06.71 Decreasing acceleration time at acceleration segment: H06.72 Decreasing deceleration time at deceleration segment: H06.73 Decreasing acceleration time at acceleration segment: H06.74
7	Smoothing parameter 7	Increasing acceleration time at acceleration segment: H06.75 Decreasing acceleration time at acceleration segment: H06.76 Decreasing deceleration time at deceleration segment: H06.77 Decreasing acceleration time at acceleration segment: H06.78
8	Smoothing parameter 8	Increasing acceleration time at acceleration segment: H06.79 Decreasing acceleration time at acceleration segment: H06.80 Decreasing deceleration time at deceleration segment: H06.81 Decreasing acceleration time at acceleration segment: H06.82

H12.23 Speed reference for speed 2

Address: 0x1217

Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	100	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.24 Operating time of speed 2

Address:	0x1218		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.25 2nd speed rise/drop and curve smoothing parameter time

Address:	0x1219	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.26 3rd speed reference

Address:	0x121A		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	300	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.27 Operating time of speed 3

Address:	0x121B		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.28 3rd speed rise/drop and curve smoothing parameter time

Address:	0x121C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.29 Speed reference for speed 4

Address:	0x121D		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	500	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.30 Operating time of speed 4

Address:	0x121E		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.31 4th speed rise/drop and curve smoothing parameter time

Address:	0x121F	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.32 Speed reference for speed 5

Address:	0x1220		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	700	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.33 Operating time of speed 5

Address:	0x1221		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.34 5th speed rise/drop and curve smoothing parameter time

Address:	0x1222	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.35 Speed reference for speed 6

Address:	0x123		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	900	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.36 Operating time of speed 6

Address:	0x1224		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.37 6th speed rise/drop and curve smoothing parameter time

Address:	0x1225	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.38 Speed reference for speed 7

Address:	0x1226		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	600	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.39 Operating time of speed 7

Address:	0x1227		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.40 7th speed rise/drop and curve smoothing parameter time

Address:	0x1228	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.41 Speed reference for speed 8

Address:	0x1229		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	300	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.42 Operating time of speed 8

Address:	0x122A		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.43 8th speed rise/drop and curve smoothing parameter time

Address:	0x122B	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.44 Speed reference for speed 9

Address:	0x122C		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	100	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.45 Operating time of speed 9

Address:	0x122D		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.46 9th speed rise/drop and curve smoothing parameter time

Address:	0x122E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.47 Speed reference for speed 10

Address:	0x122F		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-100	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.48 Operating time of speed 10

Address:	0x1230		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.49 10th speed rise/drop and curve smoothing parameter time

Address:	0x1231	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.50 Speed reference for speed 11

Address:	0x1232		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-300	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.51 Operating time of speed 11

Address:	0x1233		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.52 11th speed rise/drop and curve smoothing parameter time

Address:	0x1234	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.53 Speed reference for speed 12

Address:	0x1235		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-500	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.54 Operating time of speed 12

Address:	0x1236		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.55 12th speed rise/drop and curve smoothing parameter time

Address:	0x1237	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.56 Speed reference for speed 13

Address:	0x1238		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-700	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.57 Operating time of speed 13

Address:	0x1239		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.58 13th speed rise/drop and curve smoothing parameter time

Address:	0x123A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.59 Speed reference for speed 14

Address:	0x123B		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-900	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.60 Operating time of speed 14

Address: 0x123C

Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.61 14th speed rise/drop and curve smoothing parameter time

Address:	0x123D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.62 Speed reference for speed 15

Address: 0x123E

Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-600	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.63 Operating time of speed 15

Address: 0x123F

Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.64 15th speed rise/drop and curve smoothing parameter time

Address:	0x1240	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

H12.65 Speed reference for speed 16

Address:	0x1241		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-300	Change:	Real-time modification

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.66 Operating time of speed 16

Address:	0x1242		
Min.:	0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5	Change:	Real-time modification

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.67 16th speed rise/drop and curve smoothing parameter time

Address:	0x1243	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H12.22" on page 323* for details.

Description

Same as H12.22.

4.18 H17: Virtual DI/DO

H17.90 Communication VDI enabling

Address:	0x175A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disable

1: Enable

Description

To use the VDI function:

1. Set H17.90 to enable VDI.
2. Set the default level after power-on through H17.91.
3. Set the DI function of the VDI terminal through parameters in group H17.
4. Set VDI output through H31.00.

H17.91 VDI default value upon power-on

Address:	0x175B	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: No default

1: VDI1 default value

2: VDI2 default value

4: VDI3 default value

8: VDI4 default value

16: VDI5 default value

32: VDI6 default value

64: VDI7 default value

128: VDI8 default value

256: VDI9 default value

512: VDI10 default value

1024: VDI11 default value

2048: VDI12 default value

4096: VDI13 default value

8092: VDI14 default value

16384: VDI15 default value

32768: VDI16 default value

Description

Configures the initial value of VDI upon power-on.

Bit 0 corresponds to VDI1.

Bit 1 corresponds to VDI2.

…

Bit 15 corresponds to VDI16.

H17.00 VDI1 function selection

Address:	0x1700	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: No function

1: Servo ON

2: Alarm reset signal

3: Gain switchover switch

4: Main/Auxiliary reference switchover

5: Multi-reference direction

6: Multi-reference switchover CMD1

7: Multi-reference switchover CMD2

8: Multi-reference switchover CMD3

9: Multi-reference switchover CMD4

10: Mode switchover M1-SEL

11: Mode switchover M2-SEL

12: Zero clamp enable

13: Position reference inhibited

14: Positive limit switch

15: Negative limit switch

16: Positive external torque limit

17: Negative external torque limit

18: Forward jog

19: Reverse jog

20: Step enable
21: Hand wheel override signal 1
22: Hand wheel override signal 2
23: Hand wheel enable
24: Electronic gear ratio selection
25: Torque reference direction
26: Speed reference direction
27: Position reference direction
28: Multi-position reference enable
29: Interrupt positioning cancel
31: Home switch
32: Homing enable
33: Interrupt positioning inhibited
34: Emergency stop
35: Clear position deviation
36: Internal speed limit source
37: Pulse reference inhibited
38: Touch probe 1
39: Touch probe 2
41: Current position as the home
42: Axis control command executed immediately
43: Axis control command not executed immediately
44: Positioning and reference completed signal clear
45: Interrupt positioning enable
46: Process segment enable
47: Process segment reference switchover 1
48: Process segment reference switchover 2
49: Process segment reference switchover 3
50: Process segment reference switchover 4
51: Event trigger process segment 1
52: Event trigger process segment 2
53: Event trigger process segment 3
54: Event trigger process segment 4
55: Process segment pause

Description

-

H17.01 VDI1 logic level

Address:	0x1701	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16

Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.02 VDI2 function selection

Address:	0x1702	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.03 VDI2 logic level

Address:	0x1703	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.04 VDI3 function selection

Address:	0x1704	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.05 **VDI3 logic level**

Address:	0x1705	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.06 **VDI4 function selection**

Address:	0x1706	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.07 **VDI4 logic level**

Address:	0x1707	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.08 **VDI5 function selection**

Address:	0x1708	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.00" on page 338 for details.

Description

-

H17.09 VDI5 logic level

Address:	0x1709	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.10 VDI6 function selection

Address:	0x170A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.00" on page 338 for details.

Description

-

H17.11 VDI6 logic level

Address:	0x170B	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.12 VDI7 function selection

Address:	0x170C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.13 VDI7 logic level

Address:	0x170D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.14 VDI8 function selection

Address:	0x170E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	45	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.15 VDI8 logic level

Address:	0x170F	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.16 VDI9 function selection

Address:	0x1710	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.17 VDI9 logic level

Address:	0x1711	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.18 VDI10 function selection

Address:	0x1712	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.19 VDI10 logic level

Address:	0x1713	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.20 VDI11 function selection

Address:	0x1714	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	45	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.21 VDI11 logic level

Address:	0x1715	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.22 VDI12 function selection

Address:	0x1716	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.00" on page 338 for details.

Description

-

H17.23 VDI12 logic level

Address:	0x1717	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.24 VDI13 function selection

Address:	0x1718	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.00" on page 338 for details.

Description

-

H17.25 VDI13 logic level

Address:	0x1719	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.26 VDI14 function selection

Address:	0x171A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.27 VDI14 logic level

Address:	0x171B	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.28 VDI15 function selection

Address:	0x171C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.29 VDI15 logic level

Address:	0x171D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.30 VDI16 function selection

Address:	0x171E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.00" on page 338* for details.

Description

-

H17.31 VDI16 logic level

Address:	0x171F	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.92 Communication VDO enabling

Address:	0x175C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disable

1: Enable

Description

To use the VDO function:
1. Set H17.92 to enable VDO.
2. Set the default level after power-on through H17.93.
3. Set the DO function of the VDO terminal through parameters in group H17.
4: Read the output level of the VDO in H17.32.

H17.93 VDO default value upon power-on

Address:	0x175D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No default
1: VDO1 default value
2: VDO2 default value
4: VDO3 default value
8: VDO4 default value
16: VDO5 default value
32: VDO6 default value
64: VDO7 default value
128: VDO8 default value
256: VDO9 default value
512: VDO10 default value
1024: VDO11 default value
2048: VDO12 default value
4096: VDO13 default value
8192: VDO14 default value
16384: VDO15 default value
32768: VDO16 default value

Description

Configures the initial value of VDO upon power-on.
Bit 0 corresponds to VDO1.
Bit 1 corresponds to VDO2.
…
Bit 15 corresponds to VDO16.

H17.32 VDO virtual level

Address:	0x1720	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H17.33 VDO1 function selection

Address:	0x1721	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: No function
1: Servo ready
2: Motor rotation signal
3: Zero speed signal
4: Speed matching signal
5: Positioning completed
6: Positioning near
7: Torque limited signal
8: Speed limited signal
9: Braking
10: Warning
11: Fault
15: Interrupt positioning completed16: Homing completed
17: Electrical homing completed
18: Torque reached signal
19: Speed reached signal
21: Enable completed
22: Internal command completed
23: Writing next command allowed
24: Internal motion completed
25: Comparison output
26: Closed-loop state
30: Warning or fault output
31: Communication-forced DO
32: EDM output

Description

-

H17.34 VDO1 logic level

Address:	0x1722	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.35 VDO2 function selection

Address:	0x1723	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.36 VDO2 logic level

Address:	0x1724	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.37 VDO3 function selection

Address:	0x1725	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.33" on page 350 for details.

Description

-

H17.38 VDO3 logic level

Address:	0x1726	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.39 VDO4 function selection

Address:	0x1727	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.33" on page 350 for details.

Description

-

H17.40 VDO4 logic level

Address:	0x1728	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.41 VDO5 function selection

Address:	0x1729	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.42 VDO5 logic level

Address:	0x172A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.43 VDO6 function selection

Address:	0x172B	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.44 VDO6 logic level

Address:	0x172C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

-

H17.45 VDO7 function selection

Address:	0x172D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.46 VDO7 logic level

Address:	0x172E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

-

H17.47 VDO8 function selection

Address:	0x172F	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.48 VDO8 logic level

Address:	0x1730	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.49 VDO9 function selection

Address:	0x1731	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.50 VDO9 logic level

Address:	0x1732	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.51 VDO10 function selection

Address:	0x1733	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.33" on page 350 for details.

Description

-

H17.52 VDO10 logic level

Address:	0x1734	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.53 VDO11 function selection

Address:	0x1735	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H17.33" on page 350 for details.

Description

-

H17.54 VDO11 logic level

Address:	0x1736	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.55 VDO12 function selection

Address:	0x1737	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.56 VDO12 logic level

Address:	0x1738	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.57 VDO13 function selection

Address:	0x1739	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.58 VDO13 logic level

Address:	0x173A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

-

H17.59 VDO14 function selection

Address:	0x173B	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.60 VDO14 logic level

Address:	0x173C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

-

H17.61 VDO15 function selection

Address:	0x173D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.62 VDO15 logic level

Address:	0x173E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.63 VDO16 function selection

Address:	0x173F	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H17.33" on page 350* for details.

Description

-

H17.64 VDO16 logic level

Address:	0x1740	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

4.19 H18: Position comparison output

H18.00 Position comparison output selection

Address:	0x1800		
Min.:	0	Unit:	-

Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Disable

1: Enable (rising edge-triggered)

Description

-

H18.01 Position comparison output feedback source

Address: 0x1801

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Motor encoder feedback

1: Fully closed-loop position feedback

Description

-

H18.02 Position comparison resolution

Address: 0x1802

Min.: 0 | Unit: -
Max.: 7 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: 24-bit

1: 23-bit

2: 22-bit

3: 21-bit

4: 20-bit

5: 19-bit

6: 18-bit

7: 17-bit

Description

-

H18.03 Position comparison mode

Address: 0x1803

Min.: 0 | Unit: -
Max.: 2 | Data Type: UInt16
Default: 0 | Change: At once

Value Range:

0: Individual comparison mode

1: Cyclic comparison mode

2: Fixed cyclic comparison mode

Description

-

H18.04 Current position as zero

Address:	0x1804		
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0: Disable

1: Enable (rising edge-triggered)

Description

Note: This function needs to be used when the comparison state is inactive, otherwise the comparison logic may malfunction.

H18.05 Position comparison output width

Address:	0x1805		
Min.:	0.1	Unit:	ms
Max.:	204.7	Data Type:	UInt16
Default:	0.1	Change:	At once

Value Range:

0.1 ms to 204.7 ms

Description

Defines the effective pulse width of the DO when the comparison point is reached. The value range is 0 to 204.7 (unit: ms).

H18.06 Position comparison output ABZ port polarity

Address:	0x1806		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

bit	Name	Function
0	OCZ output logic	0: Positive, output high level upon active logic
		1: Negative, output low level upon active logic
1	Z output logic	0: Positive, output high level upon active logic
		1: Negative, output low level upon active logic
2	A/B output logic	0: Positive, output high level upon active logic
		1: Negative, output low level upon active logic

Description

0: Positive, output high level upon active logic
1: Negative, output low level upon active logic
Bit 0: OCZ output logic
Bit 1: Z output logic
bit2: A/B output logic

H18.07 Start point of position comparison

Address: 0x1807
Min.: 0 Unit: -
Max.: 40 Data Type: UInt16
Default: 0 Change: At once

Value Range:

0 to 40

Description

-

H18.08 End point of position comparison

Address: 0x1808
Min.: 0 Unit: -
Max.: 40 Data Type: UInt16
Default: 0 Change: At once

Value Range:

0 to 40

Description

-

H18.09 Current status of position comparison

Address: 0x1809
Min.: 0 Unit: -
Max.: 1024 Data Type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 1024

Description

-

H18.10 Real-time position of position comparison

Address: 0x180A

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to +2147483647

Description

-

H18.12 Zero offset of position comparison

Address: 0x180C

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	At once

Value Range:

-2147483648 to +2147483647

Description

-

H18.14 Position comparison output delay compensation

Address: 0x180E

Min.:	-12	Unit:	us
Max.:	12	Data Type:	Int16
Default:	0	Change:	At once

Value Range:

-12.00 us to +12.00 us

Description

The position comparison output function takes the last motor speed as the reference to generate output after automatic error compensation through serial communication delay of the encoder. The delay caused by hardware output can also be compensated through setting position comparison output delay compensation.

H18.15 Cycles of fixed mode

Address: 0x180F

Min.: 1
Max.: 65535
Default: 1
Unit: -
Data Type: UInt16
Change: At once

Value Range:

1 to 65535

Description

-

H18.16 ABZ output function setting

Address: 0x1810
Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt16
Change: Real-time modification

Value Range:

bit	Name	Function
0	OCZ output func tion	0: Frequency-division output
		1: Position comparison
1	Z port output func tion	0: Frequency-division output
		1: Position comparison
2	A/B port output func tion	0: Frequency-division output
		1: Position comparison

Description

0: Frequency-division output
1: Position comparison
Bit 0: OCZ port function setting
Bit 1: Z port function setting
Bit 2: A/B function setting

H18.17 Number of fixed modes completed

Address: 0x1811
Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt16
Change: Unchangeable

Value Range:

1 to 65535

Description

4.20 H19: Target position parameters

H19.00 Target value of position comparison 1

Address: 0x1900

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.02 Attribute value of position comparison 1

Address: 0x1902

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

bit	Function
0	Output DO active signal if current position changes from "less than" to "more than" the comparison point
1	Output DO active signal if current position changes from "more than" to "less than" the comparison point
2 to 6	Reserved
7	DO1 output
8	DO2 output
9	DO3 output
10	DO4 output
11	DO5 output
12	Frequency-division A output
13	Frequency-division B output
14	Frequency-division Z output
15	Frequency-division OCZ output

Description

-

H19.03 Target value of position comparison 2

Address:	0x1903		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.05 Attribute value of position comparison 2

Address:	0x1905		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.06 Target value of position comparison 3

Address:	0x1906		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.08 Attribute value of position comparison 3

Address:	0x1908		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.09 Target value of position comparison 4

Address: 0x1909

Min.: -2147483648 Unit: -
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.11 Attribute value of position comparison 4

Address: 0x190B
Min.: 0 Unit: -
Max.: 65535 Data Type: UInt16
Default: 0 Change: Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.12 Target value of position comparison 5

Address: 0x190C
Min.: -2147483648 Unit: -
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.14 Attribute value of position comparison 5

Address: 0x190E
Min.: 0 Unit: -
Max.: 65535 Data Type: UInt16
Default: 0 Change: Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.15 Target value of position comparison 6

Address: 0x190F
Min.: -2147483648 Unit: -

Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.17 Attribute value of position comparison 6

Address: 0x1911
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.18 Target value of position comparison 7

Address: 0x1912
Min.: -2147483648 | Unit: -
Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.20 Attribute value of position comparison 7

Address: 0x1914
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.21 Target value of position comparison 8

Address: 0x1915
Min.: -2147483648 | Unit: -
Max.: 2147483647 | Data Type: Int32

Default: 0 Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.23 Attribute value of position comparison 8

Address: 0x1917

Min.: 0 Unit: -

Max.: 65535 Data Type: UInt16

Default: 0 Change: Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.24 Target value of position comparison 9

Address: 0x1918

Min.: -2147483648 Unit: -

Max.: 2147483647 Data Type: Int32

Default: 0 Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.26 Attribute value of position comparison 9

Address: 0x191A

Min.: 0 Unit: -

Max.: 65535 Data Type: UInt16

Default: 0 Change: Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.27 Target value of position comparison 10

Address: 0x191B

Min.: -2147483648 Unit: -

Max.: 2147483647 Data Type: Int32

Default: 0 Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.29 Attribute value of position comparison 10

Address: 0x191D

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.30 Target value of position comparison 11

Address: 0x191E

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.32 Attribute value of position comparison 11

Address: 0x1920

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.33 Target value of position comparison 12

Address: 0x1921

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.35 Attribute value of position comparison 12

Address: 0x1923

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.36 Target value of position comparison 13

Address: 0x1924

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.38 Attribute value of position comparison 13

Address: 0x1926

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.39 Target value of position comparison 14

Address: 0x1927

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.41 Attribute value of position comparison 14

Address: 0x1929

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.42 Target value of position comparison 15

Address: 0x192A

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.44 Attribute value of position comparison 15

Address: 0x192C

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.45 Target value of position comparison 16

Address: 0x192D

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.47 Attribute value of position comparison 16

Address: 0x192F

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.48 Target value of position comparison 17

Address: 0x1930

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.50 Attribute value of position comparison 17

Address: 0x1932

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.51 Target value of position comparison 18

Address: 0x1933

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.53 Attribute value of position comparison 18

Address: 0x1935

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.54 Target value of position comparison 19

Address: 0x1936

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.56 Attribute value of position comparison 19

Address: 0x1938

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.57 Target value of position comparison 20

Address: 0x1939

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.59 Attribute value of position comparison 20

Address: 0x193B

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.60 Target value of position comparison 21

Address: 0x193C

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.62 Attribute value of position comparison 21

Address: 0x193E

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.63 Target value of position comparison 22

Address: 0x193F

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.65 Attribute value of position comparison 22

Address:	0x1941		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.66 Target value of position comparison 23

Address:	0x1942		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.68 Attribute value of position comparison 23

Address:	0x1944		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.69 Target value of position comparison 24

Address:	0x1945		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.71 Attribute value of position comparison 24

Address:	0x1947		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.72 Target value of position comparison 25

Address:	0x1948		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.74 Attribute value of position comparison 25

Address:	0x194A		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.75 Target value of position comparison 26

Address:	0x194B		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.77 Attribute value of position comparison 26

Address: 0x194D

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.78 Target value of position comparison 27

Address: 0x194E

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.80 Attribute value of position comparison 27

Address: 0x1950

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.81 Target value of position comparison 28

Address: 0x1951

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.83 Attribute value of position comparison 28

Address: 0x1953

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.84 Target value of position comparison 29

Address: 0x1954

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.86 Attribute value of position comparison 29

Address: 0x1956

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.87 Target value of position comparison 30

Address: 0x1957

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.89 Attribute value of position comparison 30

Address: 0x1959

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.90 Target value of position comparison 31

Address: 0x195A

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.92 Attribute value of position comparison 31

Address: 0x195C

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.93 Target value of position comparison 32

Address: 0x195D

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.95 Attribute value of position comparison 32

Address: 0x195F

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.96 Target value of position comparison 33

Address: 0x1960

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.98 Attribute value of position comparison 33

Address: 0x1962

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.99 Target value of position comparison 34

Address: 0x1963

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.101 Attribute value of position comparison 34

Address: 0x1965

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.102 Target value of position comparison 35

Address: 0x1966

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.104 Attribute value of position comparison 35

Address: 0x1968

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.105 Target value of position comparison 36

Address: 0x1969

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.107 Attribute value of position comparison 36

Address:	0x196B		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.108 Target value of position comparison 37

Address:	0x196C		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.110 Attribute value of position comparison 37

Address:	0x196E		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See *" H19.02" on page 365* for details.

Description

-

H19.111 Target value of position comparison 38

Address:	0x196F		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.113 Attribute value of position comparison 38

Address: 0x1971

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.114 Target value of position comparison 39

Address: 0x1972

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.116 Attribute value of position comparison 39

Address: 0x1974

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

H19.117 Target value of position comparison 40

Address: 0x1975

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

-

H19.119 Attribute value of position comparison 40

Address:	0x1977		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

See " H19.02" on page 365 for details.

Description

-

4.21 H1F Software parameters

H1F.90 DI function state 1 read through communication

Address:	0x1F5A	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DI function 1.

Bit 1 corresponds to DI function 2.

Bit 2 corresponds to DI function 3.

...

By analogy

H1F.91 DI function state 2 read through communication

Address:	0x1F5B	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DI function 17.

Bit 1 corresponds to DI function 18.

Bit 2 corresponds to DI function 19.

…

By analogy

H1F.92 DI function state 3 read through communication

Address:	0x1F5C	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DI function 33.

Bit 1 corresponds to DI function 34.

Bit 2 corresponds to DI function 35.

…

By analogy

H1F.93 DI function state 4 read through communication

Address:	0x1F5D	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DI function 49.

Bit 1 corresponds to DI function 50.

Bit 2 corresponds to DI function 51.

…

By analogy

H1F.94 DO function state 1 read through communication

Address:	0x1F5E	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DO function 1.

Bit 1 corresponds to DO function 2.

Bit 2 corresponds to DO function 3.

…

By analogy

H1F.95 DO function state 2 read through communication

Address:	0x1F5F	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DO function 17.

Bit 1 corresponds to DO function 18.

Bit 2 corresponds to DO function 19.

…

By analogy

H1F.96 DO function state 3 read through communication

Address:	0x1F60	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DO function 33.

Bit 1 corresponds to DO function 34.

Bit 2 corresponds to DO function 35.

…

By analogy

H1F.97 DO function state 4 read through communication

Address:	0x1F61	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DO function 49.

Bit 1 corresponds to DO function 50.

Bit 2 corresponds to DO function 51.

…

By analogy

4.22 H22 Technology segment parameters

H22.00 Process segment command trigger

Address:	0x2200		
Min.:	0	Unit:	-
Max.:	1000	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 1000

Description

Used to trigger the process segment and read the state. The process segment can be triggered through the keypad or communication. The process segment state can be read through H22.00.

When triggering the process segment:

The homing function is triggered when 0 is written to H22.00.

Process segments 1 to 15 are triggered when 1 to 15 are written to H22.00.

The process segment pauses when 1000 is written to H22.00.

E126.0 (Process segment number error) will be reported when 16 to 999 are written to H22.00.

When reading the state of the process segment:

The process segment number will be read back when commands in the positioning mode are not done executing.

The process segment number + 10000 will be read back when commands in the positioning mode are done executing.

The process segment number + 20000 will be read back when commands in the positioning mode are done executing and positioning has been completed.

H22.01 Process segment triggered by the event rising edge

Address:	0x2201		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

DI: ProceEvTri (OFF to ON, rising edge-triggered)

bit	Setpoint	Description
3 to 0	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri1.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri1.
7 to 4	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri2.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri2.
8 to 11	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri3.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri3.
15 to 12	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri4.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri4.

H22.02 Process segment triggered by the event falling edge

Address:	0x2202		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

DI: ProceEvTri (ON to OFF, falling edge-triggered)

bit	Setpoint	Description
3 to 0	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri1.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri1.
7 to 4	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri2.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri2.
8 to 11	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri3.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri3.
15 to 12	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri4.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri4.

H22.03 Acceleration/Deceleration time upon process segment pause

Address: 0x2203

Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0: Acceleration/Deceleration time

1: Acceleration/Deceleration time 1

2: Acceleration/Deceleration time 2

3: Acceleration/Deceleration time 3

4: Acceleration/Deceleration time 4

5: Acceleration/Deceleration time 5

6: Acceleration/Deceleration time 6

7: Acceleration/Deceleration time 7

Description

When the process segment is paused, the motor ramps to stop based on the deceleration time defined by H22.03. Setpoints 0 to 7 correspond to parameters H22.35 to H22.42.

H22.04 Positive software position limit

Address: 0x2204

Min.:	-2147483648	Unit:	Reference unit

Max.:	2147483647	Data Type:	Int32
Default:	2147483647	Change:	At once

Value Range:

-2147483648 to +2147483647

Description

E956.0 can occur when the motor operates forwardly with position reference exceeding the setpoint of H22.04 during positioning in the process segment mode.

H22.06 Negative software position limit

Address: 0x2206

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	-2147483648	Change:	At once

Value Range:

-2147483648 to +2147483647

Description

E958.0 can occur when the motor operates reversely with position reference exceeding the setpoint of H22.06 during positioning in the process segment mode.

H22.08 Process segment number

Address: 0x2208

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the process segment number in progress in the process segment mode.

H22.19 Target speed

Address: 0x2213

Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	50	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

Eight groups of target speed are available for each process segment command. Target speed refers to the constant operating speed when the motor is not in the acceleration/deceleration process. If the displacement is too small in the positioning mode, the actual motor speed will be lower than the setpoint of H22.19.

H22.20 Target speed 1

Address:	0x2214		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	200	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.21 Target speed 2

Address:	0x2215		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	500	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.22 Target speed 3

Address:	0x2216		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	1000	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.23 Target speed 4

Address:	0x2217		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	1500	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.24 Target speed 5

Address:	0x2218		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	2000	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.25 Target speed 6

Address:	0x2219		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	2500	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.26 Target speed 7

Address:	0x221A		
Min.:	0.1	Unit:	rpm
Max.:	6000	Data Type:	UInt16
Default:	3000	Change:	At once

Value Range:

0.1 rpm to 6000.0 rpm

Description

See *" H22.19" on page 391* for details.

H22.35 Acceleration/Deceleration time

Address:	0x2223		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	At once

Value Range:

0 to 65535

Description

Eight groups of acceleration/deceleration time are available for each process segment command.

Acceleration/Deceleration time refers to the time for the motor to change from 0 rpm to 1000 rpm at a constant speed.

H22.36 Acceleration/Deceleration time 1

Address: 0x2224

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	200	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.37 Acceleration/Deceleration time 2

Address: 0x2225

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.38 Acceleration/Deceleration time 3

Address: 0x2226

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	1000	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.39 Acceleration/Deceleration time 4

Address: 0x2227

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16

Default:	1500	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.40 Acceleration/Deceleration time 5

Address:	0x2228		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	2000	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.41 Acceleration/Deceleration time 6

Address:	0x2229		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	2500	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.42 Acceleration/Deceleration time 7

Address:	0x222A		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	3000	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.35" on page 393* for details.

H22.51 Delay after completion of the process segment

Address:	0x2233		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

Eight groups of delay time are available for each process segment command. The delay time refers to the delay that starts from the end of current command to the operation of the next command in the prcoess segment. See section "Process Segment Mode" in SV680P Series Servo Drive Function Guide for details.

H22.52 Delay time 1 after completion of the process segment

Address:	0x2234		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.53 Delay time 2 after completion of the process segment

Address:	0x2235		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	200	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.54 Delay time 3 after completion of the process segment

Address:	0x2236		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.55 Delay time 4 after completion of the process segment

Address:	0x2237		
Min.:	0	Unit:	ms

Max.:	65535	Data Type:	UInt16
Default:	1000	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.56 Delay time 5 after completion of the process segment

Address: 0x2238

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	1500	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.57 Delay time 6 after completion of the process segment

Address: 0x2239

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	2000	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.58 Delay time 7 after completion of the process segment

Address: 0x223A

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	3000	Change:	At once

Value Range:

0 to 65535

Description

See *" H22.51" on page 395* for details.

H22.70 Homing mode

Address: 0x2246

Min.:	-32768	Unit:	-
Max.:	32767	Data Type:	Int16

Default: -2 | Change: Real-time modification

Value Range:

-32768 to 32767

Description

Defines the default motor direction of rotation, deceleration point, and home during homing.

When H22.70 is set to a value from –2 to +35, 402 homing is used (6098h set to a value from –2 to +35). See section "Homing Function" in SV670P Series Servo Drive Communication Guide for details.

When H22.70 is set to a value lower than or equal to –200, local homing is used (H22.70 set to (–200 + H05.31)). See section "Homing Function" in SV670P Series Servo Drive Function Guide for details.

H22.71 Speed in high-speed searching for the home switch signal

Address: 0x2247

Min.:	0	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	100	Change:	At once

Value Range:

0 to 3000

Description

Defines the motor speed for searching for the deceleration point signal during homing.

H22.72 Speed in low-speed searching for the home switch signal

Address: 0x2248

Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	At once

Value Range:

0 to 1000

Description

Defines the motor speed for searching for the home signal during homing.

H22.73 Acceleration/Deceleration time during homing

Address: 0x2249

Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	1000	Change:	At once

Value Range:

0 to 1000

Description

Defines the time for the motor to accelerate from 0 rpm to 1000 rpm at a constant speed during homing.

H22.74 Homing time limit

Address:	0x224A		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	At once

Value Range:

0 to 65535

Description

Defines the maximum homing time.

H22.75 Mechanical home offset

Address:	0x224B		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	At once

Value Range:

-2147483648 to +2147483647

Description

Defines the absolute position value of the motor after homing.

H22.79 Relative/Absolute homing

Address:	0x224F		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

Defines the offset relationship between the mechanical home and mechanical zero point, as well as the action upon overtravel during homing.

When H22.79 is set to 0, the value of H05.40 is 2.

When H22.79 is set to 1, the value of H05.40 is 3.

4.23 H23 Technology segment parameters

H23.00 Definition of homing

Address: 0x2300

Min.: 0 | Unit: -

Max.: 4294967295 | Data Type: UInt32

Default: 0 | Change: Real-time modification

Value Range:

0 to 4294967295

Description

For details of each mode, see section "Process Segment Operation Mode" in SV670P Series Servo Drive Function Guide.

H23.02 Homing data

Address: 0x2302

Min.: -2147483648 | Unit: -

Max.: 2147483647 | Data Type: Int32

Default: 0 | Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Not used.

H23.04 Definition of process segment 1

Address: 0x2304

Min.: 0 | Unit: -

Max.: 4294967295 | Data Type: UInt32

Default: 0 | Change: Real-time modification

Value Range:

0 to 4294967295

Description

bit0 to bit3: Mode (process segment operation mode option)

Mode = 1: The fixed speed mode applies.

Mode = 2: The positioning mode applies, which stops after positioning is done.

Mode = 3: The next segment is executed automatically after positioning is done.

Mode = 7: The jump mode applies, which is used to jump to the designated process segment.

Mode = 8: The parameter-write mode applies, which allows you to write specific parameters.

See section "Process Segment Operation Mode" in SV670P Series Servo Drive Function Guide for details.

H23.06 **Data of process segment 1**

Address:	0x2306		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Different modes selected in process segment 1 correspond to different process segment data. See section "Process Segment Operation Mode" in SV670P Series Servo Drive Function Guide for details.

H23.08 **Definition of process segment 2**

Address:	0x2308		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.04" on page 400*.

H23.10 **Data of process segment 2**

Address:	0x230A		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.12 **Definition of process segment 3**

Address:	0x230C		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.04" on page 400*.

H23.14 Data of process segment 3

Address: 0x230E

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as " H23.06" on page 401.

H23.16 Definition of process segment 4

Address: 0x2310

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as " H23.04" on page 400.

H23.18 Data of process segment 4

Address: 0x2312

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as " H23.06" on page 401.

H23.20 Definition of process segment 5

Address: 0x2314

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as " H23.06" on page 401.

H23.22 Data of process segment 5

Address: 0x2316

Min.: -2147483648 | Unit: -
Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.24 Definition of process segment 6

Address: 0x2318

Min.: 0 | Unit: -
Max.: 4294967295 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.06" on page 401*.

H23.26 Data of process segment 6

Address: 0x231A

Min.: -2147483648 | Unit: -
Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.28 Definition of process segment 7

Address: 0x231C

Min.: 0 | Unit: -
Max.: 4294967295 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.06" on page 401*.

H23.30 Data of process segment 7

Address: 0x231E

Min.: -2147483648 | Unit: -

Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

Value Range:
-2147483648 to 2147483647

Description
Same as *" H23.06" on page 401*.

H23.32 Definition of process segment 8

Address: 0x2320
Min.: 0 | Unit: -
Max.: 4294967295 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:
0 to 4294967295

Description
Same as *" H23.06" on page 401*.

H23.34 Data of process segment 8

Address: 0x2322
Min.: -2147483648 | Unit: -
Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

Value Range:
-2147483648 to 2147483647

Description
Same as *" H23.06" on page 401*.

H23.36 Definition of process segment 9

Address: 0x2324
Min.: 0 | Unit: -
Max.: 4294967295 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:
0 to 4294967295

Description
Same as *" H23.06" on page 401*.

H23.38 Data of process segment 9

Address: 0x2326
Min.: -2147483648 | Unit: -
Max.: 2147483647 | Data Type: Int32

Default: 0 | Change: Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.40 Definition of process segment 10

Address: 0x2328

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.06" on page 401*.

H23.42 Data of process segment 10

Address: 0x232A

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.44 Definition of process segment 11

Address: 0x232C

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.06" on page 401*.

H23.46 Data of process segment 11

Address: 0x232E

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.48 Definition of process segment 12

Address:	0x2330		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.06" on page 401*.

H23.50 Data of process segment 12

Address:	0x2332		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as *" H23.06" on page 401*.

H23.52 Definition of process segment 13

Address:	0x2334		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as *" H23.06" on page 401*.

H23.54 Data of process segment 13

Address:	0x2336		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as " H23.06" on page 401.

H23.56 Definition of process segment 14

Address:	0x2338		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as " H23.06" on page 401.

H23.58 Data of process segment 14

Address:	0x233A		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as " H23.06" on page 401.

H23.60 Definition of process segment 15

Address:	0x233C		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as " H23.06" on page 401.

H23.62 Data of process segment 15

Address:	0x233E		
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Same as " H23.06" on page 401.

4.24 H30 Related variables read through communication

H30.00 Servo status read through communication

Address: 0x3000

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

-

H30.01 DO function state 1 read through communication

Address: 0x3001

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

Used to read the state of DO functions 1 to 16 through communication. H30.01 is a hexadecimal which is not displayed on the keypad and must be converted to a binary equivalent when it is being read through communication.

bit	DO Function	Remarks
0	DO function 1 (FunOUT.1: S-RDY, servo ready)	0: Servo drive not ready 1: Servo ready
...		
15	DO function 16 (FunOUT.16: HomeAttain, homing output)	0: Home not found 1: Home found

H30.02 DO function state 2 read through communication

Address: 0x3002

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

Used to read the state of DO functions 17 to 20 through communication. H30.02 is a hexadecimal which is not displayed on the keypad and must be converted to a binary equivalent when it is being read through communication.

bit0 corresponds to DO function 17.

bit1 corresponds to DO function 18.

bit2 corresponds to DO function 19.

…

By analogy

bit	DO Function	Remarks
0	DO function 17 (FunOUT.17: S-ElecHomeAttain, electrical homing output)	0: Electrical homing not completed 1: Electrical homing completed
...		
4 to 15	Reserved	-

H30.03 Input pulse reference sampling value read through communication

Address: 0x3003

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

Value Range:

0 to 65535

Description

-

4.25 H31 Communication setting parameters

H31.00 VDI virtual level set through communication

Address: 0x3100

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: At once

Value Range:

0 to 65535

Description

When H17.90 is set to 1, the VDI state is defined by H31.00.

The VDI logic is determined by H17.91 (Default VDI virtual level value upon upower-on) upon initial power-on. Thereafter, the VDI logic is determined by H31.00.
"bit(n) = 1" of H31.00 indicates the logic of VDI (n+1) is "1". "bit(n)=0" indicates the logic of VDI (n+1) is "0".

H31.04 DO status set through communication

Address:	0x3104		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At once

Value Range:

0 to 65535

Description

Set H04.22 to define H31.04 as the source of DO state.

H31.05 AO set through communication

Address:	0x3105		
Min.:	-10000	Unit:	mV
Max.:	10000	Data Type:	Int16
Default:	0	Change:	At once

Value Range:

-10000 mV to +10000 mV

Description

Set H04.50 to 10 to define H31.05 as the source of AO (unit: mV).

H31.09 Speed reference set through communication

Address:	0x3109		
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

–10000.000 RPM to +10000.000 RPM

Description

Set H06.02 to 4 to define H31.09 as the source of the speed reference in the speed control mode (unit: RPM).

H31.11 Torque reference set through communication

Address:	0x310B		
Min.:	-100	Unit:	%
Max.:	100	Data Type:	Int32

Default: 0 Change: At once

Value Range:

-100.000% to +100.000%

Description

Set H07.02 to 4 to define H31.11 as the source of the torque reference in the torque control mode. The setpoint 100.000% corresponds to the rated torque of the motor.

4.26 1000h Object dictionary

1000h **Device type**

Address: -

Min.:	-	Unit:	-
Max.:	-	Data Type:	UInt32
Default:	0x20192	Change:	Unchangeable

Value Range:

-

Description

-

1005h **SYNC message COB-ID**

Address: 0x2D00

Min.:	128	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	128	Change:	Real-time modification

Value Range:

128 to 4294967295

Description

Only 0x80 and 0x40000080 can be written to the SYNC message.

If 0x80 is written, the sync generator does not work.

If 0x40000080 is written, the sync generator is activated.

To activate the sync generator, you must set 1006h to a non-zero value.

1006h **Synchronization cycle**

Address: 0x2D02

Min.:	0	Unit:	us
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0us to 2147483647us

Description

Applicable to the synchronization generator only (unit: us).

1008h Device manufacturer name

Address:	-		
Min.:	-	Unit:	-
Max.:	-	Data Type:	UInt32
Default:	SV670P	Change:	Unchangeable

Value Range:

-

Description

-

100Ch Node guarding time

Address:	0x2D04		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Defines the node daemon running time, in ms.

100dh Life factor

Address:	0x2D04		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 to 255

Description

This parameter must be used together with the node daemon function and must be set to a value greater than 1.

1014h Emergency message COB-ID

Address:	0x2D06		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

The most significant bit indicates whether to disable the emergency message of the device. Only the data "0x80+Node_ID" can be written for the bit to enable the emergency message of the device.

If the data "0x80000080+Node_ID" is written, the emergency message is disabled. When the emergency message is enabled, the COB-ID must be the same as that of the object.

1016.01h Consumer heartbeat time 1

Address:	0x2D06		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Parameters include the address of the monitored node and actual consumer time, which must be longer than the heartbeat producer time (unit: ms) of the corresponding node. Two different consumer time cannot be set for one node.

Bits 0 to 15: Monitoring time

Bits 16 to 23: The monitored address

Bits 24 to 31: Reserved (0)

1016.02h Consumer heartbeat time 2

Address:	0x2D0A		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1016.01h.

1016.03h Consumer heartbeat time 3

Address:	0x2D0C		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1016.01h.

1016.04h Consumer heartbeat time 4

Address:	0x2D0E		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1016.01h.

1016.05h Consumer heartbeat time 5

Address:	0x2D10		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1016.01h.

1017h Producer heartbeat time

Address:	0x2D12		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Defines the heartbeat production time of the slave, in ms.

1018.01h Vendor ID

Address:	-		
Min.:	-	Unit:	-
Max.:	-	Data Type:	UInt32
Default:	0x3B9	Change:	Unchangeable

Value Range:

1

Description

-

1018.02h Device code

Address: -

Min.: - Unit: -
Max.: - Data Type: UInt32
Default: 0xD0117 Change: Unchangeable

Value Range:

-

Description

-

1018.03h Device revision

Address: -
Min.: - Unit: -
Max.: - Data Type: UInt32
Default: 0X20001 Change: Unchangeable

Value Range:

-

Description

-

1400.01h COB-ID of RPDO1

Address: 0x2D14
Min.: 0 Unit: -
Max.: 4294967295 Data Type: UInt32
Default: 512 Change: Real-time modification

Value Range:

0 to 4294967295

Description

Only the most significant bit can be modified. When the most significant bit is 0, the PDO is active. When the most significant bit is 1, the PDO is inactive.

The factory settings are as follows:

1400h: 0x00000200 + Node_ID

1401h: 0x80000300 + Node_ID

1402h: 0x80000400 + Node_ID

1403h: 0x80000500 + Node_ID

1400.02h Transmission type of RPDO1

Address: 0x2D16
Min.: 0 Unit: -
Max.: 255 Data Type: UInt16
Default: 255 Change: Real-time modification

Value Range:

0 to 255

Description

This parameter can be modified only when PDO is inactive.
Different values correspond to different PDO transmission types, as follows:
0: Not circle synchronous data
1 to 240: Circle synchronous data
254 and 255: Not circle asynchronous data

1401.01h COB-ID of RPDO2

Address:	0x2D17		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 4294967295
Description
Same as 1400.01h.

1401.02h Transmission type of RPDO2

Address:	0x2D19		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:
0 to 255
Description
Same as 1400.02h.

1402.01h COB-ID of RPDO3

Address:	0x2D1A		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 4294967295
Description
Same as 1400.01h.

1402.02h Transmission type of RPDO3

Address:	0x2D1C		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:
0 to 255
Description
Same as 1400.02h.

1403.01h COB-ID of RPDO4

Address:	0x2D1D		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 4294967295
Description
Same as 1400.01h.

1403.02h Transmission type of RPDO4

Address:	0x2D1F		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:
0 to 255
Description
Same as 1400.02h.

1600.00h Number of valid mapped objects in RPDO1

Address:	0x2D20		
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1600.01h 1st mapped object in RPDO1

Address:	0x2D21		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.
Sub-indexes are written in the following format:
Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1600.02h 2nd mapped object in RPDO1

Address: 0x2D23

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1600.01h.

1600.03h 3rd mapped object in RPDO1

Address: 0x2D25

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1600.01h.

1600.04h 4th mapped object in RPDO1

Address: 0x2D27

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1600.01h.

1600.05h 5th mapped object in RPDO1

Address: 0x2D29
Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1600.06h 6th mapped object in RPDO1

Address: 0x2D2B
Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1600.07h 7th mapped object in RPDO1

Address: 0x2D2D
Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1600.08h 8th mapped object in RPDO1

Address: 0x2D2F
Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1601.00h Number of valid mapped objects in RPDO2

Address: 0x2D31

Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Real-time modification

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1601.01h 1st mapped object in RPDO2

Address: 0x2D32

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

1601.02h 2nd mapped object in RPDO2

Address: 0x2D34

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1616904200	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1601.01h.

1601.03h 3rd mapped object in RPDO2

Address: 0x2D36

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.04h 4th mapped object in RPDO2

Address:	0x2D36		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.05h 5th mapped object in RPDO2

Address:	0x2D3A		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.06h 6th mapped object in RPDO2

Address:	0x2D3A		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.07h 7th mapped object in RPDO2

Address:	0x2D3E		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1601.01h.

1601.08h 8th mapped object in RPDO2

Address:	0x2D40		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1601.01h.

1602.00h Number of valid mapped objects in RPDO3

Address:	0x2D40		
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Real-time modification

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1602.01h 1st mapped object in RPDO3

Address:	0x2D43		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

1602.02h 2nd mapped object in RPDO3

Address:	0x2D45		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1618608160	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.03h 3rd mapped object in RPDO3

Address:	0x2D47		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.04h 4th mapped object in RPDO3

Address:	0x2D49		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.05h 5th mapped object in RPDO3

Address:	0x2D4B		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.06h 6th mapped object in RPDO3

Address: 0x2D4D

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.07h 7th mapped object in RPDO3

Address: 0x2D4F

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.08h 8th mapped object in RPDO3

Address: 0x2D51

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1603.00h Number of valid mapped objects in RPDO4

Address: 0x2D53

Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Real-time modification

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1603.01h 1st mapped object in RPDO4

Address: 0x2D54

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 1614807056 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

1603.02h 2nd mapped object in RPDO4

Address: 0x2D56

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 1627324448 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1603.03h 3rd mapped object in RPDO4

Address: 0x2D58

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1603.04h 4th mapped object in RPDO4

Address: 0x2D5A

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1603.05h 5th mapped object in RPDO4

Address:	0x2D5C		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1603.06h 6th mapped object in RPDO4

Address:	0x2D5E		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1603.07h 7th mapped object in RPDO4

Address:	0x2D60		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1603.08h 8th mapped object in RPDO4

Address:	0x2D62		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1603.01h.

1800.01h COB-ID of TPDO1

Address:	0x2E00		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Only the MSB and the second MSB can be modified.

When the most significant bit is 0, the PDO is active. When the most significant bit is 1, the PDO is inactive.

The second most significant bit defines whether the PDO can be triggered by a remote frame. You are recommended to set this bit to 1 to disable the remote frame to trigger the PDO.

The factory settings are as follows:

1800h: 0x40000180 + Node_ID

1801h: 0xC0000280 + Node_ID

1802h: 0xC0000380 + Node_ID

1803h: 0xC0000480 + Node_ID

1800.02h Transmission type of TPDO1

Address:	0x2E02		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:

0 to 255

Description

This parameter can be modified only when PDO is inactive. Different values correspond to different PDO transmission types, as follows:

0: Not circle synchronous data

1 to 240: Circle synchronous data

254 and 255: Not circle asynchronous data

1800.03h Inhibit time of TPDO1

Address:	0x2E03		
Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16

Default: 500 | Change: Real-time modification

Value Range:

0 us to 65535 us

Description

This parameter can be modified only when PDO is inactive.

The unit is 100 µs. The value 0 indicates that the inhibit time is invalid.

1800.05h Event counter of TPDO1

Address: 0x2E04

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

This parameter can be modified only when PDO is inactive.

When the unit is ms, the value 0 indicates that the event counter is inactive.

1801.01h COB-ID of TPDO2

Address: 0x2E05

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as 1800.01h.

1801.02h Transmission type of TPDO2

Address: 0x2E07

Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:

0 to 255

Description

Same as 1800.02h.

1801.03h Inhibit time of TPDO2

Address: 0x2E08

Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16

Default:	500	Change:	Real-time modification

Value Range:

0100us to 65535100us

Description

Same as 1800.03h.

1801.05h Event counter of TPDO2

Address:	0x2E09		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Same as 1800.05h.

1802.01h COB-ID of TPDO3

Address:	0x2E0A		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as 1800.01h.

1802.02h Transmission type of TPDO3

Address:	0x2E0C		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:

0 to 255

Description

Same as 1800.02h.

1802.03h Inhibit time of TPDO3

Address:	0x2E0D		
Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Real-time modification

Value Range:

0 us to 65535 us

Description

Same as 1800.03h.

1802.05h Event counter of TPDO3

Address:	0x2E0E		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Same as 1800.05h.

1803.01h COB-ID of TPDO4

Address:	0x2E0F		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Same as 1800.01h.

1803.02h Transmission type of TPDO4

Address:	0x2E11		
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Real-time modification

Value Range:

0 to 255

Description

Same as 1800.02h.

1803.03h Inhibit time of TPDO4

Address:	0x2E12		
Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Real-time modification

Value Range:

0 us to 65535 us

Description

Same as 1800.03h.

1803.05h Event counter of TPDO4

Address:	0x2E13		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Same as 1800.05h.

1A00.00h Number of valid mapped objects in TPDO1

Address:	0x2E14		
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A00.01h 1st mapped object in TPDO1

Address:	0x2E15		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

1A00.02h 2nd mapped object in TPDO1

Address:	0x2E17		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.03h 3rd mapped object in TPDO1

Address:	0x2E19		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.04h 4th mapped object in TPDO1

Address:	0x2E1B		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.05h 5th mapped object in TPDO1

Address:	0x2E1D		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.06h 6th mapped object in TPDO1

Address: 0x2E1F

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.07h 7th mapped object in TPDO1

Address: 0x2E1F

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.08h 8th mapped object in TPDO1

Address: 0x2E23

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A01.00h Number of valid mapped objects in TPDO2

Address: 0x2E25

Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Real-time modification

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A01.01h 1st mapped object in TPDO2

Address: 0x2E26

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

1A01.02h 2nd mapped object in TPDO2

Address: 0x2E28

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1616969736	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A01.03h 3rd mapped object in TPDO2

Address: 0x2E2A

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A01.04h 4th mapped object in TPDO2

Address: 0x2E2C

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A01.05h 5th mapped object in TPDO2

Address:	0x2E2E		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A01.06h 6th mapped object in TPDO2

Address:	0x2E30		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A01.07h 7th mapped object in TPDO2

Address:	0x2E32		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A01.08h 8th mapped object in TPDO2

Address:	0x2E34		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A01.01h.

1A02.00h Number of valid mapped objects in TPDO3

Address:	0x2E36		
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Real-time modification

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A02.01h 1st mapped object in TPDO3

Address:	0x2E37		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

1A02.02h 2nd mapped object in TPDO3

Address:	0x2E39		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1617166368	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.03h 3rd mapped object in TPDO3

Address:	0x2E3B		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.04h 4th mapped object in TPDO3

Address:	0x2E3D		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.05h 5th mapped object in TPDO3

Address:	0x2E3F		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.06h 6th mapped object in TPDO3

Address:	0x2E41		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.07h 7th mapped object in TPDO3

Address: 0x2E43

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1A02.01h.

1A02.08h 8th mapped object in TPDO3

Address: 0x2E45

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
Same as 1A02.01h.

1A03.00h Number of valid mapped objects in TPDO4

Address: 0x2E47

Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Real-time modification

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A03.01h 1st mapped object in TPDO4

Address: 0x2E48

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Real-time modification

Value Range:
0 to 2147483647
Description
The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.
Sub-indexes are written in the following format:

Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1A03.02h 2nd mapped object in TPDO4

Address:	0x2E4A		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1617690656	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

1A03.03h 3rd mapped object in TPDO4

Address:	0x2E4C		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

1A03.04h 4th mapped object in TPDO4

Address:	0x2E4E		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

1A03.05h 5th mapped object in TPDO4

Address:	0x2E50		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

1A03.06h 6th mapped object in TPDO4

Address:	0x2E52		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

1A03.07h 7th mapped object in TPDO4

Address:	0x2E54		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

1A03.08h 8th mapped object in TPDO4

Address:	0x2E56		
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 2147483647

Description

Same as 1A03.01h.

4.27 6000h Description of object dictionary

603Fh Error Code

Address:	0x3500		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

When an error described in the DSP402 profile occurs on the servo drive, 603Fh is as described in DSP402.

When an error specified by the user occurs on the servo drive, 603Fh is 0xFF00.

The value of 603Fh is in hexadecimal.

In addition, the object dictionary 203Fh displays auxiliary bytes of fault codes in hexadecimal.

203Fh is a UInt32 value, in which the high 16 bits indicate the internal fault code of the manufacturer, and the low 16 bits indicate the external fault code of the manufacturer.

6040h Control word

Address:	0x3502		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 to 65535

Description

See the SV670P Series Servo Drive Communication Guide for details.

6041h Status word

Address:	0x3504		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

See the SV670P Series Servo Drive Communication Guide for details.

605Ah Quick stop option code

Address:	0x3536		
Min.:	0	Unit:	-
Max.:	7	Data Type:	Int16
Default:	2	Change:	At stop

Value Range:

0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state
6: Ramp to stop as defined by 6085h, keeping position lock state
7: Stop at emergency stop torque, keeping position lock state

Description

Defines the quick stop mode.
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
4: N/A
5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state
6: Ramp to stop as defined by 6085h, keeping position lock state
7: Stop at emergency stop torque, keeping position lock state

605Ch Stop mode at S-ON OFF

Address: 0x353A

Min.:	-4	Unit:	-
Max.:	2	Data Type:	Int16
Default:	0	Change:	At stop

Value Range:

–4: Ramp to stop as defined by 6085h, keeping dynamic braking state
–3: Stop at zero speed, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/ 609Ah, keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/ 609Ah, keeping de-energized state
2: Dynamic braking stop, keeping de-energized state

Description

Sets the stop mode at S-ON OFF.
–4: Ramp to stop as defined by 6085h, keeping dynamic braking state
–3: Stop at zero speed, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/609Ah, keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah, keeping de-energized status
2: Dynamic braking stop, keeping de-energized state

605Dh **Stop option code**

Address: 0x353C

Min.:	1	Unit:	-
Max.:	3	Data Type:	Int16
Default:	1	Change:	At stop

Value Range:

1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state
2: Ramp to stop as defined by 6085h, keeping position lock state
3: Stop at emergency stop torque, keeping position lock state

Description

Defines the halt mode.
1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state
2: Ramp to stop as defined by 6085h, keeping position lock state
3: Stop at emergency stop torque, keeping position lock state

605Eh **Stop mode at No.2 fault**

Address: 0x353E

Min.:	-5	Unit:	-
Max.:	4	Data Type:	Int16
Default:	2	Change:	At stop

Value Range:

–5: Stop at zero speed, keeping dynamic braking state
–4: Stop at emergency stop torque, keeping dynamic braking state
–3: Ramp to stop as defined by 6085h, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

Description

Defines the stop mode at No.2 fault.
–5: Stop at zero speed, keeping dynamic braking state
–4: Stop at emergency stop torque, keeping dynamic braking state
–3: Ramp to stop as defined by 6085h, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/609Ah (HM), keeping dynamic braking state

–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized stat
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

6060h Modes of operation

Address:	0x3542		
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode

Description
Defines the servo drive operation mode.
0: N/A (forced to be PP)
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode
Others: N/A
If an unsupported operation mode is selected through an SDO, an SDO error will be returned.
If an unsupported operation mode is selected through a PDO, the change of the operation mode will be invalid.

6061h Operation mode display

Address:	0x3544		
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode

Description

Indicates the actual operation mode.
0: Profile position (PP) mode
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode

6062h Position reference

Address: 0x3546

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the real-time position reference (reference unit).

6063h Position actual value

Address: 0x3548

Min.:	-2147483648	Unit:	Pulse
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

–2147483648 to +2147483647

Description

Indicates the absolute position feedback (encoder unit) of the motor in real time.

6064h Position actual value

Address: 0x354A

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the absolute position feedback (reference unit) in real time.

Position actual value in user-defined unit (6064h) x Gear ratio (6091h) = Position actual value in encoder unit (6063h)

6065h Following error window

Address:	0x354C		
Min.:	0	Unit:	Reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	27486951	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Defines the threshold of excessive position deviation (reference unit).

When the difference value between position demand value (6062h) and position actual value (6064h) keeps exceeding ±6065h after the time defined by 6066h elapses, B00.0 (Position deviation too large) occurs.

6066h Following error time out

Address:	0x354E		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 ms to 65535 ms

Description

Defines the time lapse to trigger excessive position deviation (EB00.0), which must be used together with 6065h.

6067h Position window

Address:	0x3550		
Min.:	0	Unit:	Reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	5872	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Defines the threshold for position reach.

If the difference between 6062h and 6064h is within ±6067h and the time reaches 6068h, the position is reached. In this case, bit 10 of 6041h is set to 1 in the profile position mode.
This flag bit is meaningful only when the S-ON signal is active in the profile position mode.

6068h **Position window time**

Address:	0x3552		
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:
0 ms to 65535 ms

Description
Defines the window time for position reach, which must be used together with 6067h.

606Ch **Actual speed**

Address:	0x355A		
Min.:	-2147483648	Unit:	Reference unit/s
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
–2147483648 to +2147483647

Description
Indicates the velocity actual value.

606Dh **Velocity window**

Address:	0x355C		
Min.:	0	Unit:	rpm
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	Real-time modification

Value Range:
0 to 65535

Description
Defines the threshold for speed reach.
If the difference value between the target speed 60FFh and the actual speed 606Ch is within ±606Dh and the time reaches 606Eh, the speed is reached and bit 10 of the status word 6041h is set to 1 in the profile velocity (PV) mode.
This flag bit is meaningful only when the servo drive is enabled in PV mode.

606Eh Velocity window time

Address: 0x355E

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

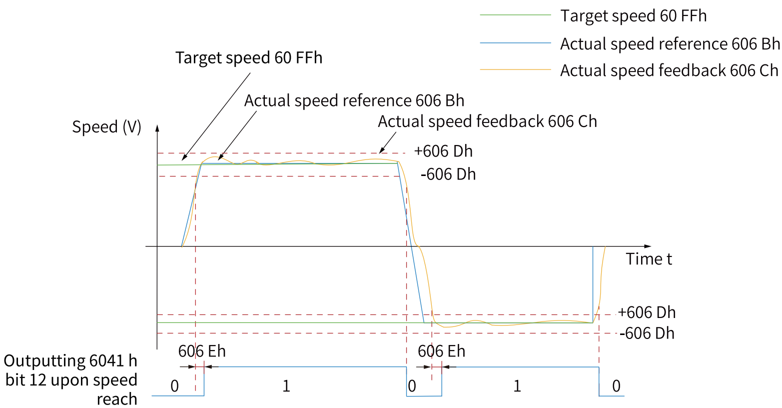
0 ms to 65535 ms

Description

Defines the time window for speed reach, which must be used together with 606Dh.

Defines the time window for speed arrival. If the difference value between the target speed 60FFh and the actual speed 606Ch is within ±606Dh and the time reaches 606Eh, the speed is reached and bit 10 of the status word 6041h is set to 1 in the profile velocity (PV) mode.

This flag bit is meaningful only when the servo drive is enabled in PV mode.



606Fh Velocity threshold

Address: 0x3560

Min.:	0	Unit:	rpm
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	Real-time modification

Value Range:

0 to 65535

Description

Defines the threshold for determining whether the user velocity is 0.

When 606Ch is within ±606Fh and the time reaches the value set by 6070h, the user velocity is 0. When either condition is not met, the user velocity is not 0.

This flag bit is meaningful only in the profile velocity mode.
This flag bit is unrelated to the enable/disable state of the servo drive.

6070h Velocity threshold time

Address: 0x3562

Min.: 0 | Unit: ms

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Real-time modification

Value Range:

0 ms to 65535 ms

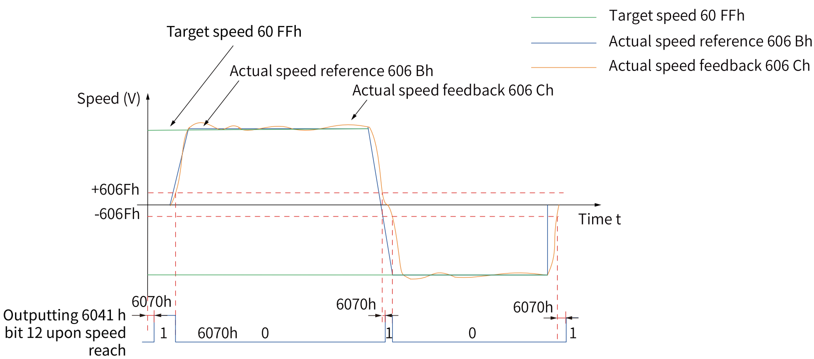
Description

Defines the time window for determining whether the user velocity is 0, which must be used together with 606Fh.

When 606Ch is within ±606Fh and the time reaches the value set by 6070h, the user velocity is 0. When either condition is not met, the user velocity is not 0.

This flag bit is meaningful only in the profile velocity mode.

This flag bit is unrelated to the enable/disable state of the servo drive.



6071h Target torque

Address: 0x3564

Min.: -4000 | Unit: 0.001

Max.: 4000 | Data Type: Int16

Default: 0 | Change: Real-time modification

Value Range:

-4000.000 to 4000.000

Description

Defines the target torque of the servo drive in the profile torque mode.

The value 1000 corresponds to the rated torque of the motor.

6072h Max. torque

Address: 0x3566

Min.:	0	Unit:	0.001
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Real-time modification

Value Range:

0.000 to 4000.000

Description

Defines the maximum torque reference limit.

The value 1000 corresponds to the rated torque of the motor.

6074h Torque reference

Address: 0x356A

Min.:	-4000	Unit:	0.001
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-4000.000 to 4000.000

Description

Defines the target torque value.

The value 1000 corresponds to the rated torque of the motor.

6077h Torque actual value

Address: 0x3570

Min.:	-4000	Unit:	0.001
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-4000.000 to 4000.000

Description

Indicates the internal torque feedback of the servo drive.

The value 1000 corresponds to the rated torque of the motor.

607Ah Target position

Address: 0x3576

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Defines the target position of the servo drive in the profile position mode.
When bit 6 of 6040h is set to 0, 607Ah indicates the absolute target position of current segment.
After positioning of current segment is done, the value of 6064h will be the same as the value of 607Ah.
When bit 6 of 6040h is set to 1, 607Ah indicates the target increment displacement of current segment.
After positioning of current segment is done, user displacement increment will be the same as the value of 607Ah.

607Ch **Home offset**

Address:	0x357A		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Defines the physical location of mechanical zero that deviates from the home of the motor in position control modes (profile position mode, interpolation mode, and homing mode).
The home offset in active under the following conditions: The device is powered on, the homing operation is complete, and bit 15 of 6041h is set to 1.
After homing is done, the position actual value (6064h) will be the same as the value of 607Ch.
If 607Ch is beyond the value of 607Dh (Software position limit), E09.1 occurs (Home setting error).

607D.01-h **Min. position limit**

Address:	0x3700		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	-2147483648	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Defines the minimum software position limit relative to the mechanical zero point.
Minimum software position limit = (607D.01h)

The software position limit is used to judge the absolute position. When homing is not performed, the internal software position limit is invalid.
The condition for activating the software position limit is set in H0A.01 (object dictionary 0x200A.02h).

607D.02-h **Max. position limit**

Address:	0x3800		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	2147483647	Change:	Real-time modification

Value Range:
-2147483648 to 2147483647
Description
Defines the maximum software position limit relative to the mechanical zero.
Maximum software position limit = (607D.02h)

607Eh **Reference polarity**

Address:	0x357E		
Min.:	0	Unit:	-
Max.:	128	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:
0 to 127
Description
Defines the polarity of position or speed references.
When bit 7 is 1, it indicates the position reference is multiplied by "–1" and the motor direction is reversed in the standard position mode or interpolation mode.
When bit 6 is 1, it indicates the speed reference (60FFh) is multiplied by "–1" and the motor direction is reversed in the speed mode.
When bit 5 is 1, it indicates the torque demand value (6071h) is multiplied by "–1" and the motor direction is reversed in the torque mode.
Other bits are meaningless.

607Fh **Max. profile velocity**

Address:	0x3580		
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	838860800	Change:	Real-time modification

Value Range:
0 to 4294967295

Description

Defines the maximum user running speed.

Set a proper gear ratio (8:1 recommended) when using a 23-bit encoder. Otherwise, the motor speed will be limited to 3840 RPM.

6081h Profile velocity

Address:	0x3584		
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	13981013	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Defines the constant running speed of the displacement reference in the profile position mode.

The set value takes effect after the slave receives the displacement reference.

6083h Profile acceleration

Address:	0x3588		
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	1398101333	Change:	Real-time modification

Value Range:

0 reference unit/s^2 to 4294967295 reference units/s^2

Description

Defines the acceleration of the displacement reference in the profile position mode.

The following formula applies if a motor equipped with 23-bit encoder needs to run at 400 RPM (6081h: 400 x 8388608/60) with acceleration rate being 400 RPM/s (6083h: 400 x 8388608/60) and deceleration rate being 200 RPM/s (6084h: 200 x 8388608/60) under a gear ratio of 1:1:

Acceleration time t_{up} = Δ6081h/Δ6083h = 1 (s). Deceleration time t_{down} = Δ6081h/Δ6084h=2 (s).

6084h Profile deceleration

Address:	0x358A		
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	1398101333	Change:	Real-time modification

Value Range:

0 reference unit/s^2 to 4294967295 reference units/s^2

Description

Defines the deceleration rate in the deceleration stage of the displacement reference in the profile position mode.

The following formula applies if a motor equipped with 23-bit encoder needs to run at 400 RPM (6081h: 400 x 8388608/60) with acceleration rate being 400 RPM/s (6083h: 400 x 8388608/60) and deceleration rate being 200 RPM/s (6084h: 200 x 8388608/60) under a gear ratio of 1:1:

Acceleration time t_{up} = Δ6081h/Δ6083h = 1 (s). Deceleration time t_{down} = Δ6081h/Δ6084h=2 (s).

6085h Quick stop deceleration

Address: 0x358C

Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	2147483647	Change:	Real-time modification

Value Range:

0 reference unit/s^2 to 4294967295 reference units/s^2

Description

Defines the deceleration rate when the quick stop command (6040h = 0x0002) is active and 605Ah (Quick stop option code) is set to 2 or 5.

6087h Torque slope

Address: 0x3590

Min.:	0	Unit:	0.1%/s
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Real-time modification

Value Range:

0%/S to 4294967295%/s

Description

Defines the acceleration (torque increment per second) of the torque reference in profile torque mode, indicating the torque reference increment per second.

In the profile torque mode, if 605Ah is set to 1, 2, 5, or 6, or 605Dh is set to 1 or 2, the servo drive decelerates to stop as defined by 6087h.

If the value of 6087h exceeds the torque reference limit, the limit value will be used.

6091.01h Motor revolutions

Address: 0x3714

Min.:	1	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	1	Change:	At stop

Value Range:

1 to 4294967295

Description

Defines the numerator of the gear ratio.

Defines the proportional relation between the load shaft displacement designated by the user and the motor shaft displacement.

The relation between motor position feedback (encoder unit) and load shaft position feedback (reference unit) is as follows.

Motor position feedback = Load shaft position feedback x Gear ratio

The relation between the motor speed (RPM) and the load shaft speed (reference unit/s) is as follows.

Motor speed (RPM) = Load shaft speed x 6091h x 60/Encoder resolution

The relation between the motor acceleration (RPM/ms) and the load shaft acceleration (reference unit/s^2) is as follows.

Motor acceleration (RPM/ms) = Load shaft acceleration x 6091h x 1000/Encoder resolution/60

6091.02h Shaft revolutions

Address:	0x3814		
Min.:	1	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	1	Change:	At stop

Value Range:

1 to 4294967295

Description

Defines the denominator of the gear ratio.

6098h Homing method

Address:	0x35B2		
Min.:	-3	Unit:	-
Max.:	35	Data Type:	Int16
Default:	1	Change:	Real-time modification

Value Range:

-3 to 35

Description

When 6098h is set to 15, 16, 31 or 32, it is meaningless and the servo drive does not perform the homing operation.

Table 4–7 Description of homing method

Set point	Description
-3	Nearby, Z signal as home
-2	Forward, positive mechanical limit as deceleration point and Z signal as home
-1	Reverse, negative mechanical limit as deceleration point and Z signal as home
1	Reverse, negative limit switch as deceleration point and Z signal as home, falling edge of the negative limit switch signal must be reached before Z signal
2	Forward, positive limit switch as deceleration point and Z signal as home, falling edge of positive limit switch signal must be reached before Z signal
3	Forward, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
4	Forward, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
5	Reverse, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
6	Reverse, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
7	Forward, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
8	Forward, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
9	Forward, home switch as deceleration point and Z signal as home, rising edge on the other side of the home switch signal must be reached before Z signal
10	Forward, home switch as deceleration point and Z signal as home, falling edge on the other side of the home switch signal must be reached before Z signal
11	Reverse, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
12	Reverse, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
13	Reverse, home switch as deceleration point and Z signal on the other side of the home switch signal as home, rising edge on the other side of the home switch signal must be reached before Z signal
14	Reverse, home switch as deceleration point and Z signal on the other side of the home switch signal as home, falling edge on the other side of the home switch signal must be reached before Z signal
17 to 32	Similar to setpoints 1...14 except that the deceleration point coincide with the home
33	Reverse, Z signal as home
34	Forward, Z signal as home

Set point	Description
35	Current position as home
When 6098h is set to 15, 16, 31 or 32, it is meaningless and the servo drive does not perform the homing operation.	

6099.01h Speed during search for switch

Address: 0x371C

Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	13981013	Change:	At stop

Value Range:

0 to 4294967295

Description

Defines the speed during search for the deceleration point signal. A large setpoint helps prevent E601.0 (Homing timeout).

6099.02h Speed during search for zero

Address: 0x381C

Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	1398101	Change:	At stop

Value Range:

0 to 4294967295

Description

Defines the speed in searching for the home signal. Setting this speed to a low value prevents overshoot during stop at high speed, avoiding excessive deviation between the stop position and the set mechanical home.

609Ah Homing acceleration

Address: 0x35B6

Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	1398101333	Change:	Real-time modification

Value Range:

0 reference unit/s^2 to 4294967295 reference units/s^2

Description

Defines the acceleration rate in the homing mode.

The setpoint is activated after homing is started.

When a motor equipped with 23-bit encoder runs in HM mode, 605A is set to 1, 609A is set to 0, and the electronic gear ratio is set to 8388608, the acceleration rate is forced to be 1 during acceleration. If the control word is set to 2, the quick stop mode is stop at zero speed and the actual deceleration rate is forced to be $2^{32} - 1$.

60B8h Touch probe function

Address:	0x35F2		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time modification

Value Range:

0 to 65535

Description

For the touch probe function, see Touch Probe Function in the SV670P Series Servo Drive Communication Guide.

60B9h Touch probe status

Address:	0x35F4		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

For the touch probe status, see Touch Probe Function in the SV670P Series Servo Drive Communication Guide.

60BAh Touch probe 1 positive edge

Address:	0x35F6		
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the position feedback value (reference unit) latched at positive edge of touch probe 1 signal.

60BBh Touch probe 1 negative edge

Address: 0x35F8

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the position feedback value (reference unit) latched at negative edge of touch probe 1 signal.

60BCh Touch probe 2 positive edge

Address: 0x35FA

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the position feedback value (reference unit) latched at positive edge of touch probe 2 signal.

60BDh Touch probe 2 negative edge

Address: 0x35FC

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the position feedback value (reference unit) latched at negative edge of touch probe 2 signal.

60C1.01h Interpolation displacement

Address: 0x3744

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

-2147483648 to 2147483647

Description

Defines the displacement reference in the interpolation mode.
In interpolation mode, 60C1.01h must be set to synchronize PDO and the transmission type must be set to 1.
The host controller will send a displacement reference to the slave upon every synchronization cycle.

60C2.01h Interpolation time period

Address:	0x3745		
Min.:	1	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	1	Change:	Real-time modification

Value Range:

1 to 20

Description

Defines the interpolation time units.
The allowed sync period range is 1 ms to 20 ms. When a value beyond this range is set, the setpoint is used as the sync period.
The synchronization cycle must be set after the servo drive stops running.

60C2.02h Interpolation time units

Address:	0x3845		
Min.:	0	Unit:	-
Max.:	253	Data Type:	UInt16
Default:	253	Change:	Real-time modification

Value Range:

0 to 253

Description

Defines the interpolation period time unit.
The value "–3" indicates the unit ms. Therefore, the actual interpolation period (ms) is the value of 60C2.01h.

60C5h Max. acceleration

Address:	0x360C		
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Real-time modification

Value Range:

0 reference unit/s^2 to 4294967295 reference units/s^2

Description

Defines the maximum permissible deceleration in the profile position mode, profile velocity mode, and homing mode.
For 609Ah, the setpoint 0 will be forcibly changed to 1.

60C6h Max. deceleration

Address:

Min.:	0	Unit:	Reference unit/s2
Max.:	4.294967295E9	Data Type:	UInt32
Default:	4.294967295E9	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

Defines the maximum permissible deceleration in the profile position mode, profile velocity mode, and homing mode.
For 609Ah, the setpoint 0 will be forcibly changed to 1.

60D5h Touch probe 1 positive edge counter

Address: 0x362C

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The counting value is added by "1" each time this object is triggered.

60D6h Touch probe 1 negative edge counter

Address: 0x362E

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The counting value is added by "1" each time this object is triggered.

60D7h Touch probe 2 positive edge counter

Address: 0x3630

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
The counting value is added by "2" each time this object is triggered.

60D8h Touch probe 2 negative edge counter

Address: 0x3632

Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
The counting value is added by "2" each time this object is triggered.

60E0h Positive torque limit value

Address: 0x3642

Min.:	0	Unit:	0.001
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Real-time modification

Value Range:
0.000 to 4000.000
Description
Defines the maximum torque limit of the servo drive in the forward direction.

60E1h Negative torque limit value

Address: 0x3644

Min.:	0	Unit:	0.001
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Real-time modification

Value Range:
0.000 to 4000.000
Description
Defines the maximum torque limit of the servo drive in the reverse direction.

60F4h Position deviation

Address: 0x366A

Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the position deviation (reference unit).

60FCh **Position reference**

Address:	0x367A		
Min.:	-2147483648	Unit:	Pulse
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

–2147483648 to +2147483647

Description

Indicates the position reference (encoder unit).

If no warning is detected when the S-ON signal is active, the relation between the position reference in reference unit and that in encoder unit is as follows:

60FCh (in encoder unit) = 6062h (in reference unit) x 6091h

60FDh **DI state**

Address:	0x367C		
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Indicates current DI logic of the drive.

0: Inactive
1: Active
The signal indicated by each bit is described as follows:

bit	Function
0	Negative limit switch
1	Positive limit switch
2	Home switch
3 to 15	N/A
16	DI1 input
17	DI2 input
18	DI3 input
19	DI4 input
20	DI5 input
21	DI6 input
22	DI7 input
23	DI8 input
24 to 26	N/A
27	STO1 signal input
28	STO2 signal input
29	EDM output active
30	Z signal active
31	N/A

60FFh Target velocity

Address: 0x3680
Min.: -2147483648 Unit: Reference unit/s
Max.: 2147483647 Data Type: Int32
Default: 0 Change: Real-time modification

Value Range:

–2147483648 to +2147483647

Description

Defines the target speed in the profile velocity mode.

60FE.01h Physical outputs

Address: 0x3781
Min.: 0 Unit: -
Max.: 4294967295 Data Type: UInt32
Default: 0 Change: Real-time modification

Value Range:

0 to 4294967295

Description

Indicates the DO logic.

The signal indicated by each bit is described as follows:

bit	Description
0 to 15	N/A
16	Forced DO1 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 16 of 60FE.02h is set to 1
17	Forced DO2 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 17 of 60FE.02h is set to 1
18	Forced DO3 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 18 of 60FE.02h is set to 1
19	Forced DO4 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 19 of 60FE.02h is set to 1
20	Forced DO5 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 20 of 60FE.02h is set to 1
21 to 25	N/A
26	Switched between P and PI for gain switchover only when bit 26 of 60FE.02h is set to 1
27 to 31	N/A

60FE.02h Bitmask

Address: 0x3881

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Real-time modification

Value Range:

0 to 4294967295

Description

0 to 15: N/A

16: Forced DO1 output enable

17: Forced DO2 output enable

18: Forced DO3 output enable

19: Forced DO4 output enable

20: Forced DO5 output enable

19 to 25: N/A

26: P/PI switchover enable

27 to 31: N/A

5 参数一览表

5.1 Parameter Group H00

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H00.00	0x0000	Motor code	0 to 65535	14101	-	At stop	" H00.00" on page 138
H00.02	0x0002	Customized No.	0 to 2^{32} - 1	0	-	Unchangeable	" H00.02" on page 138
H00.04	0x0004	Encoder version	0.0 to 6553.5	0	-	Unchangeable	" H00.04" on page 138
H00.05	0x0005	Serial-type motor code	0 to 65535	0	-	Unchangeable	" H00.05" on page 138
H00.06	0x0006	FPGA customized SN	0.00 to 655.35	0	-	Unchangeable	" H00.06" on page 139
H00.07	0x0007	STO version	0.00 to 655.35	0	-	Unchangeable	" H00.07" on page 139
H00.08	0x0008	Serial encoder type	0 to 65535	0	-	At stop	" H00.08" on page 139

5.2 Parameter Group H01

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H01.00	0x0100	MCU software version	0.0 to 6553.5	0	-	Un changeable	" H01.00" on page 140
H01.01	0x0101	FPGA software version	0.0 to 6553.5	0	-	Un changeable	" H01.01" on page 140
H01.02	0x0102	Servo drive series No.	0 to 65535	0	-	Un changeable	" H01.02" on page 140
H01.06	0x0106	Board software version	0 to 6554	0	-	Un changeable	" H01.06" on page 140

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H01.10	0x010A	Drive series No.	2: S1R6 3: S2R8 5: S5R5 60005: S6R6 6: S7R6 7: S012 8: S018 9: S022 10: S027 10001: T3R5 10002: T5R4 10003: T8R4 10004: T012 10005: T017 10006: T021 10007: T026	3	-	At stop	*" H01.10" on page 141*
H01.11	0x010B	DC-AC voltage class	0 V to 65535 V	220	V	Unchangeable	*" H01.11" on page 141*
H01.12	0x010C	Rated power of the drive	0.00 kW–10737418.24 kW	0.4	kW	Unchangeable	*" H01.12" on page 141*
H01.14	0x010E	Max. output power of the drive	0.00 kW–10737418.24 kW	0.4	kW	Unchangeable	*" H01.14" on page 142*
H01.16	0x0110	Rated output current of the drive	0.00 A to 10737418.24 A	2.8	A	Unchangeable	*" H01.16" on page 142*
H01.18	0x0112	Max. output current of the drive	0.00 A to 10737418.24 A	10.1	A	Unchangeable	*" H01.18" on page 142*
H01.40	0x0128	DC bus overvoltage protection threshold	0 V to 2000 V	420	V	Immediately	*" H01.40" on page 142*
H01.75	0x014B	Current loop amplification factor	0.00 to 655.35	1	-	Immediately	*" H01.75" on page 143*
H01.89	0x0159	Junction temperature parameter version	0 to 65.535	0	-	Unchangeable	*" H01.89" on page 143*

5.3 Parameter Group H02

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H02.00	0x0200	Control mode	0: Speed control mode 1: Position control mode 2: Torque control mode 3: Torque/Speed control mode 4: Speed/Position control mode 5: Torque/Position control mode 6: Torque/Speed/Position compound mode 7: Process segment	1	-	At stop	" H02.00" on page 143
H02.01	0x0201	Absolute system selection	0: Incremental mode 1: Absolute position linear mode 2: Absolute position rotation mode 3: Absolute position linear mode (without encoder overflow warning) 4: Absolute position single-turn mode	0	-	At stop	" H02.01" on page 144
H02.02	0x0202	Direction of rotation	0: Counterclockwise (CCW) as forward direction 1: Clockwise (CW) as forward direction	0	-	At stop	" H02.02" on page 144
H02.03	0x0203	Output pulse phase	0: Phase A leads phase B 1: Phase A lags behind phase B	0	-	At stop	" H02.03" on page 145
H02.05	0x0205	Stop mode at S-ON OFF	-4: Stop based on ramp 2, keeping dynamic braking state -3: Stop at zero speed, keeping dynamic braking state -2: Stop based on ramp 1, keeping dynamic braking state -1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Stop based on ramp 1, keeping de-energized state 2: Dynamic braking stop, keeping de-energized state	0	-	Immediately	" H02.05" on page 146

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H02.06	0x0206	Stop mode at No.2 fault	-5: Stop at zero speed, keeping dynamic braking state -4: Stop at emergency stop torque, keeping dynamic braking state -3: Stop based on ramp 2, keeping dynamic braking state -2: Stop based on ramp 1, keeping dynamic braking state -1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Stop based on ramp 1, keeping de-energized state 2: Stop based on ramp 2, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 4: Dynamic braking stop, keeping de-energized state	2	-	Immediately	" H02.06" on page 146
H02.07	0x0207	Stop mode at overtravel	0: Coast to stop, keeping de-energized state 1: Stop at zero speed, keeping position lock state 2: Stop at zero speed, keeping de-energized state 3: Stop based on ramp 2, keeping de-energized state 4: Stop based on ramp 2, keeping position lock state 5: Dynamic braking stop, keeping de-energized state 6: Dynamic braking stop, keeping dynamic braking state 7: Not responding to overtravel	1	-	At stop	" H02.07" on page 146
H02.08	0x0208	Stop mode at No.1 fault	0: Coast to stop, keeping de-energized state 1: Dynamic braking stop, keeping de-energized state 2: Dynamic braking stop, keeping dynamic braking state	2	-	At stop	" H02.08" on page 147
H02.09	0x0209	Delay from brake output ON to command received	0 ms to 500 ms	250	ms	Immediately	" H02.09" on page 147

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H02.10	0x020A	Delay from brake output off to motor de-energized	50 ms to 1000 ms	150	ms	Immediately	" H02.10" on page 148
H02.11	0x020B	Motor speed threshold at brake output OFF in rotation state	20 rpm to 3000 rpm	30	rpm	Immediately	" H02.11" on page 148
H02.12	0x020C	Delay from S-ON OFF to brake output OFF in rotation state	1 ms to 65535 ms	500	ms	Immediately	" H02.12" on page 148
H02.15	0x020F	Warning display on the keypad	0: Output warning information immediately 1: Not output warning information	0	-	Immediately	" H02.15" on page 148
H02.17	0x0211	Stop mode upon main circuit power failure	0: Keep current action 1: Stop upon fault as defined by H02.06 2: Stop at S-ON OFF as defined by H02.05 3: Stop quickly as defined by H02.18	2	-	Immediately	" H02.17" on page 149
H02.18	0x0212	Quick stop mode	0: Coast to stop, keeping de-energized state 1: Stop based on ramp 1, keeping de-energized state 2: Stop based on ramp 2, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized status 5: Stop based on ramp 1, keeping position lock state 6: Stop based on ramp 2, keeping position lock state 7: Stop at emergency stop torque, keeping position lock state	2	-	Immediately	" H02.18" on page 149
H02.21	0x0215	Permissible minimum resistance of regenerative resistor	1 Ω to 1000 Ω	40	Ω	Unchangeable	" H02.21" on page 149
H02.23	0x0217	Resistance of built-in regenerative resistor	0 Ω to 65535 Ω	50	Ω	Unchangeable	" H02.23" on page 150

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H02.24	0x0218	Resistor heat dissipation coefficient	10% to 100%	30	%	Immediately	" H02.24" on page 151
H02.25	0x0219	Regenerative resistor type	0: Built-in 1: External, natural cooling 2: External, forced air cooling 3: No resistor needed	3	-	Immediately	" H02.25" on page 152
H02.26	0x021A	Power of external regenerative resistor	1 W–65535 W	40	W	Immediately	" H02.26" on page 152
H02.27	0x021B	Resistance of external regenerative resistor	15 Ω to 1000 Ω	50	Ω	Immediately	" H02.27" on page 152
H02.30	0x021E	User password	0 to 65535	0	-	Immediately	" H02.30" on page 152
H02.31	0x021F	System parameter initialization	0: No operation 1: Restore default settings 2: Clear fault records	0	-	At stop	" H02.31" on page 153
H02.32	0x0220	Selection of parameters in group H0b	0 to 99	50	-	Immediately	" H02.32" on page 153
H02.35	0x0223	Keypad data update frequency	0 Hz to 20 Hz	0	Hz	Immediately	" H02.35" on page 153
H02.41	0x0229	Manufacturer password	0 to 65535	0	-	Immediately	" H02.41" on page 153

5.4 Parameter Group H03

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H03.00	0x0300	DI function allocation 1 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.1 2: Corresponding to FunIN.2 4: Corresponding to FunIN.3 8: Corresponding to FunIN.4 16: Corresponding to FunIN.5 32: Corresponding to FunIN.6 64: Corresponding to FunIN.7 128: Corresponding to FunIN.8 256: Corresponding to FunIN.9 512: Corresponding to FunIN.10 1024: Corresponding to FunIN.11 2048: Corresponding to FunIN.12 4096: Corresponding to FunIN.13 8192: Corresponding to FunIN.14 16384: Corresponding to FunIN.15 32768: Corresponding to FunIN.16	0	-	Immediately	" H03.00" on page 154
H03.01	0x0301	DI function allocation 2 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.17 2: Corresponding to FunIN.18 4: Corresponding to FunIN.19 8: Corresponding to FunIN.20 16: Corresponding to FunIN.21 32: Corresponding to FunIN.22 64: Corresponding to FunIN.23 128: Corresponding to FunIN.24 256: Corresponding to FunIN.25 512: Corresponding to FunIN.26 1024: Corresponding to FunIN.27 2048: Corresponding to FunIN.28 4096: Corresponding to FunIN.29 16384: Corresponding to FunIN.31 32768: Corresponding to FunIN.32	0	-	Immediately	" H03.01" on page 154
H03.02	0x0302	DI1 function selection	See " H03.02" on page 155 for details.	14	-	Immediately	" H03.02" on page 155
H03.03	0x0303	DI1 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.03" on page 157
H03.04	0x0304	DI2 function selection	See " H03.02" on page 155 for details.	15	-	Immediately	" H03.04" on page 157
H03.05	0x0305	DI2 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.05" on page 157
H03.06	0x0306	DI3 function selection	See " H03.02" on page 155 for details.	13	-	Immediately	" H03.06" on page 157

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H03.07	0x0307	DI3 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.07" on page 158
H03.08	0x0308	DI4 function selection	See " H03.02" on page 155 for details.	2	-	Immediately	" H03.08" on page 158
H03.09	0x0309	DI4 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.09" on page 158
H03.10	0x030A	DI5 function selection	See " H03.02" on page 155 for details.	1	-	Immediately	" H03.10" on page 158
H03.11	0x030B	DI5 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.11" on page 159
H03.12	0x030C	DI6 function selection	See " H03.02" on page 155 for details.	0	-	Immediately	" H03.12" on page 159
H03.13	0x030D	DI6 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.13" on page 159
H03.14	0x030E	DI7 function selection	See " H03.02" on page 155 for details.	45	-	Immediately	" H03.14" on page 159
H03.15	0x030F	DI7 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.15" on page 160
H03.16	0x0310	DI8 function selection	See " H03.02" on page 155 for details.	31	-	Immediately	" H03.16" on page 160
H03.17	0x0311	DI8 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03.17" on page 160
H03.34	0x0322	DI function allocation 3 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.33 2: Corresponding to FunIN.34 4: Corresponding to FunIN.35 8: Corresponding to FunIN.36 16: Corresponding to FunIN.37 32: Corresponding to FunIN.38 64: Corresponding to FunIN.39 128: Corresponding to FunIN.40 256: Corresponding to FunIN.41 512: Corresponding to FunIN.42 1024: Corresponding to FunIN.43 2048: Corresponding to FunIN.44 4096: Corresponding to FunIN.45 8192: Corresponding to FunIN.46 16384: Corresponding to FunIN.47 32768: Corresponding to FunIN.48	0	-	Immediately	" H03.34" on page 160

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H03.35	0x0323	DI function allocation 4 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.49 2: Corresponding to FunIN.50 4: Corresponding to FunIN.51 8: Corresponding to FunIN.52 16: Corresponding to FunIN.53 32: Corresponding to FunIN.54 64: Corresponding to FunIN.55 128: Corresponding to FunIN.56 256: Corresponding to FunIN.57 512: Corresponding to FunIN.58 1024: Corresponding to FunIN.59 2048: Corresponding to FunIN.60 4096: Corresponding to FunIN.61 8192: Corresponding to FunIN.62 16384: Corresponding to FunIN.63	0	-	Immediately	" H03.35" on page 161
H03.50	0x0332	Voltage-type AI1 offset	-5000 mV to 5000 mV	0	mV	Immediately	" H03.50" on page 162
H03.51	0x0333	Voltage-type AI1 input filter time constant	0.00 ms to 655.35 ms	2	ms	Immediately	" H03.51" on page 162
H03.53	0x0335	Voltage-type AI1 dead zone	0 mV to 1000 mV	10	mV	Immediately	" H03.53" on page 163
H03.54	0x0336	Voltage-type AI1 zero drift	-5000 mV to 5000 mV	0	mV	Immediately	" H03.54" on page 163
H03.60	0x033C	DI1 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.60" on page 163
H03.61	0x033D	DI2 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.61" on page 163
H03.62	0x033E	DI3 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.62" on page 164
H03.63	0x033F	DI4 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.63" on page 164
H03.64	0x0340	DI5 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.64" on page 164
H03.65	0x0341	DI6 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.65" on page 164
H03.66	0x0342	DI7 filter time	0.00 ms to 500.00 ms	0.00	ms	Immediately	" H03.66" on page 165
H03.67	0x0343	DI8 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03.67" on page 165

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H03.80	0x0350	Speed corresponding to analog 10 V	0 rpm to 10000 rpm	3000	rpm	At stop	" H03.80" on page 165
H03.81	0x0351	Torque corresponding to analog 10 V	1 to 8	1	Multiplier	At stop	" H03.81" on page 166

5.5 Parameter Group H04

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H04.00	0x0400	DO1 function selection	0: No function 1: Servo ready 2: Motor rotation signal 3: Zero speed signal 4: Speed matching signal 5: Positioning completed 6: Positioning near 7: Torque limited signal 8: Speed limited signal 9: Braking 10: Warning 11: Fault 15: Interrupt positioning completed 16: Home found 17: Electrical homing completed 18: Torque reached signal 19: Speed reached signal 21: Enable completed 22: Internal command completed 23: Writing next command allowed 24: Internal motion completed 25: Comparison output 26: Closed loop state 30: Warning or fault output 31: Communication-forced DO 32: EDM output	1	-	Immediately	" H04.00" on page 166
H04.01	0x0401	DO1 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04.01" on page 167
H04.02	0x0402	DO2 function selection	See " H04.00" on page 166 for details.	9	-	Immediately	" H04.02" on page 167

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H04.03	0x0403	DO2 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04.03" on page 167
H04.04	0x0404	DO3 function selection	See " H04.00" on page 166 for details.	0	-	Immediately	" H04.04" on page 168
H04.05	0x0405	DO3 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04.05" on page 168
H04.06	0x0406	DO4 function selection	See " H04.00" on page 166 for details.	11	-	Immediately	" H04.06" on page 168
H04.07	0x0407	DO4 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04.07" on page 168
H04.08	0x0408	DO5 function selection	See " H04.00" on page 166 for details.	16	-	Immediately	" H04.08" on page 169
H04.09	0x0409	DO5 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04.09" on page 169
H04.22	0x0416	DO source selection	bit0: DO1 0: DO1 function output 1: Bit 0 of H31.04 set through communication bit1: DO2 0: DO2 function output 1: Bit 1 of H31.04 set through communication bit2: DO3 0: DO3 function output 1: Bit 2 of H31.04 set through communication bit3: DO4 0: DO4 function output 1: Bit 3 of H31.04 set through communication bit4: DO5 0: DO5 function output 1: Bit 4 of H31.04 set through communication	0	-	Immediately	" H04.22" on page 169

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H04.23	0x0417	Communication-forced DO logic in non-OP status	bit0: DO1 0: Status unchanged 1: No output bit1: DO2 0: Status unchanged 1: No output bit2: DO3 0: Status unchanged 1: No output bit3: DO4 0: Status unchanged 1: No output bit4: DO5 0: Status unchanged 1: No output	0	-	Immediately	*" H04.23" on page 170*
H04.50	0x0432	AO1 signal selection	0: Motor speed (1 V/1000 RPM) 1: Speed reference (1 V/1000 RPM) 2: Torque reference (1 V/100 x Rated torque) 3: Position deviation (0.5 mV/1 reference unit) 4: Position deviation (0.5 mV/1 encoder unit) 5: Position reference speed (1 V/1000 RPM) 6: Positioning completed 8: AI1 voltage 10: Defined by H31.05	0	-	Immediately	*" H04.50" on page 171*
H04.51	0x0433	AO1 offset voltage	-10000 mV to 10000 mV	0	mV	Immediately	*" H04.51" on page 171*
H04.52	0x0434	AO1 multiplier	-99.99 to 99.99	1	-	Immediately	*" H04.52" on page 172*

5.6 Parameter Group H05

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.00	0x0500	Main position reference source	0: Pulse reference 1: Step reference 2: Multi-position reference	0	-	Immediately	*" H05.00" on page 172*
H05.01	0x0501	Position pulse reference input terminal	0: Low speed 1: High speed	0	-	At stop	*" H05.01" on page 172*

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.02	0x0502	Pulses per revolution	0 PPR to 4294967295 PPR	0	PPR	At stop	" H05.02" on page 173
H05.04	0x0504	First-order low-pass filter time constant	0.0 ms to 6553.5 ms	0	ms	At stop	" H05.04" on page 173
H05.05	0x0505	Step reference	-9999 to +9999	50	Reference unit	At stop	" H05.05" on page 174
H05.06	0x0506	Moving average filter time constant 1	0.0 ms to 128.0 ms	0	ms	At stop	" H05.06" on page 174
H05.07	0x0507	Electronic gear ratio 1 (numerator)	1 to 1073741824	8388608	-	Immediately	" H05.07" on page 174
H05.09	0x0509	Electronic gear ratio 1 (denominator)	1 to 1073741824	10000	-	Immediately	" H05.09" on page 175
H05.11	0x050B	Electronic gear ratio 2 (numerator)	1 to 1073741824	8388608	-	Immediately	" H05.11" on page 175
H05.13	0x050D	Electronic gear ratio 2 (denominator)	1 to 1073741824	10000	-	Immediately	" H05.13" on page 175
H05.15	0x050F	Pulse reference form	0: Direction + Pulse, positive logic 1: Direction + Pulse, negative logic 2: Phase A + phase B quadrature pulse, quadrupled frequency 3: CW + CCW	0	-	At stop	" H05.15" on page 175
H05.16	0x0510	Clear action	0: Position deviation cleared upon S-OFF or non-RUN state 1: Position deviation cleared upon fault or non-RUN state 2: Position deviation cleared upon active DI function 35 or non-RUN state	0	-	At stop	" H05.16" on page 177
H05.17	0x0511	Number of encoder frequency-division pulses	0 PPR to 4194303 PPR	2500	PPR	At stop	" H05.17" on page 177

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.19	0x0513	Speed feedforward control	0: No speed feedforward 1: Internal speed feedforward 2: External speed feedforward 3: Zero phase	1	-	At stop	" H05.19" on page 178
H05.20	0x0514	Condition for COIN (positioning completed) signal output	See " H05.20" on page 178	0	-	Immediately	" H05.20" on page 178
H05.21	0x0515	Threshold of positioning completed	1 to 65535	5872	Encoder unit	Immediately	" H05.21" on page 179
H05.22	0x0516	Proximity threshold	1 to 65535	65535	Encoder unit	Immediately	" H05.22" on page 180
H05.24	0x0518	Displacement of interrupt positioning	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H05.24" on page 180
H05.26	0x051A	Constant operating speed in interrupt positioning	0 rpm to 10000 rpm	200	rpm	Immediately	" H05.26" on page 180
H05.27	0x051B	Acceleration/ Deceleration time of interrupt positioning	0 ms to 65535 ms	10	ms	Immediately	" H05.27" on page 180
H05.29	0x051D	Interrupt positioning cancel signal	0: Disable 1: Enable	1	-	Immediately	" H05.29" on page 181
H05.30	0x051E	Homing selection	0: Disabled 1: Homing enabled through the HomingStart signal input from DI 2: Electrical homing enabled through the HomingStart signal input from DI 3: Homing started immediately upon power-on 4: Homing executed immediately 5: Electrical homing started 6: Current position as home 8: D-triggered position as home	0	-	Immediately	" H05.30" on page 181
H05.31	0x051F	Homing mode	See " H05.31" on page 181	0	-	Immediately	" H05.31" on page 181

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.32	0x0520	Speed in high-speed searching for the home switch signal	0 rpm to 3000 rpm	100	rpm	Immediately	" H05.32" on page 182
H05.33	0x0521	Speed in low-speed searching for the home switch signal	0 rpm to 1000 rpm	10	rpm	Immediately	" H05.33" on page 182
H05.34	0x0522	Acceleration/ Deceleration time during homing	0 ms to 1000 ms	1000	ms	Immediately	" H05.34" on page 183
H05.35	0x0523	Homing time limit	0 ms to 65535 ms	10000	ms	Immediately	" H05.35" on page 183
H05.36	0x0524	Mechanical home offset	-2147483648 to 2147483647	0	Reference unit	Immediately	" H05.36" on page 183
H05.38	0x0526	Frequency-division output source	0: Encoder frequency-division output 1: Pulse reference synchronous output 2: Frequency-division output inhibited 3: Second encoder frequency-division output	0	-	Immediately	" H05.38" on page 183
H05.39	0x0527	Electronic gear ratio switchover condition	0: Switchover after position reference is kept 0 for 2.5 ms 1: Switched in real time	0	-	At stop	" H05.39" on page 184
H05.40	0x0528	Mechanical home offset and action upon overtravel	0: H05.36 as the coordinate after homing, reverse homing applied after homing triggered again upon overtravel 1: H05.36 as the relative offset after homing, reverse homing applied after homing triggered again upon overtravel 2: H05.36 as the coordinate after homing, reverse homing applied automatically upon overtravel 3: H05.36 as the relative offset after homing, reverse homing applied automatically upon overtravel	0	-	Immediately	" H05.40" on page 184

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.41	0x0529	Z pulse output polarity	Bit 0: Frequency-division Z output polarity 0: Positive (high level upon active Z pulse) 1: Negative (low level upon active Z pulse) Bit 1: output polarity 0: Positive (high level upon active Z pulse) 1: Negative (low level upon active Z pulse) bit2: Inner loop probe Z signal source 0: Motor Z signal 1: Frequency-division output Z signal	1	-	At stop	" H05.41" on page 185
H05.43	0x052B	Position pulse edge	0: Rising edge-triggered 1: Falling edge-triggered	0	-	Immediately	" H05.43" on page 186
H05.44	0x052C	Numerator of frequency-division output reduction ratio	1 to 16383	1	-	At stop	" H05.44" on page 187
H05.45	0x052D	Denominator of frequency-division output reduction ratio	1 to 8191	1	-	At stop	" H05.45" on page 187
H05.46	0x052E	DI selection of multi-turn frequency-division Z starting point	0: No selection 1: DI1 2: DI2 3: DI3 4: DI4 5: DI5 6: DI6 7: DI7 8: DI8	0	-	Immediately	" H05.46" on page 187
H05.47	0x052F	Frequency-division Z pulse width	0 us to 400 us	0	us	Immediately	" H05.47" on page 188

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.50	0x0532	Mechanical gear ratio in absolute position rotation mode (numerator)	1 to 65535	1	-	At stop	" H05.50" on page 188
H05.51	0x0533	Mechanical gear ratio in absolute position rotation mode (denominator)	1 to 65535	1	-	At stop	" H05.51" on page 188
H05.52	0x0534	Pulses per revolution of the load in absolute position rotation mode (low 32 bits)	0 to 4294967295	0	Encoder unit	At stop	" H05.52" on page 188
H05.54	0x0536	Pulses per revolution of the load in absolute position rotation mode (high 32 bits)	0 to 4294967295	0	Encoder unit	At stop	" H05.54" on page 189
H05.58	0x053A	Torque threshold in homing upon hit-and-stop	0.0% to 400.0%	100	%	Immediately	" H05.58" on page 189
H05.59	0x053B	Positioning window time	0 ms to 30000 ms	0	ms	Immediately	" H05.59" on page 189
H05.60	0x053C	Hold time of positioning completed	0 ms to 30000 ms	0	ms	Immediately	" H05.60" on page 190
H05.66	0x0542	Homing time unit	0: 1 ms 1: 10 ms 2: 100 ms	2	-	At stop	" H05.66" on page 190

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H05.67	0x0543	Offset between zero point and single-turn absolute position	-2147483648 to +2147483647	0	1 encoder unit	At stop	" H05.67" on page 190
H05.70	0x0546	Moving average filter time constant 2	0.0 ms to 1000.0 ms	0	ms	At stop	" H05.70" on page 190
H05.71	0x0547	Motor Z signal width	1 ms to 100 ms	4	ms	Immediately	" H05.71" on page 191
H05.72	0x0548	External speed feedforward source selection	0: 60B1 1: AI1	1	-	Immediately	" H05.72" on page 191

5.7 Parameter Group H06

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.00	0x0600	Source of main speed reference A	0: Digital setting (H06.03) 1: AI1	0	-	At stop	" H06.00" on page 191
H06.01	0x0601	Source of auxiliary speed reference B	0: Digital setting (H06.03) 1: AI1 5: Multi-speed reference	1	-	At stop	" H06.01" on page 192
H06.02	0x0602	Speed reference source	0: Source of main speed reference A 1: Source of auxiliary speed reference B 2: A+B 3: Switched between A and B 4: Communication	0	-	At stop	" H06.02" on page 192
H06.03	0x0603	Speed reference set through keypad	–10000 RPM to +10000 RPM	200	rpm	Immediately	" H06.03" on page 193
H06.04	0x0604	DI jog speed reference	0 rpm to 10000 rpm	150	rpm	Immediately	" H06.04" on page 193

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.05	0x0605	Acceleration ramp time of speed reference	0 ms to 65535 ms	0	ms	Immedi ately	" H06.05" on page 193
H06.06	0x0606	Deceleration ramp time of speed reference	0 ms to 65535 ms	0	ms	Immedi ately	" H06.06" on page 194
H06.07	0x0607	Maximum speed limit	0 rpm to 10000 rpm	7000	rpm	Immedi ately	" H06.07" on page 194
H06.08	0x0608	Forward speed limit	0 rpm to 10000 rpm	7000	rpm	Immedi ately	" H06.08" on page 194
H06.09	0x0609	Reverse speed limit	0 rpm to 10000 rpm	7000	rpm	Immedi ately	" H06.09" on page 194
H06.10	0x060A	Deceleration unit in emergency stop	0: Multiplied by 1 1: Multiplied by 10 2: Multiplied by 100	0	-	At stop	" H06.10" on page 195
H06.11	0x060B	Torque feedforward control	0: No torque feedforward 1: Internal torque feedforward	1	-	Immedi ately	" H06.11" on page 195
H06.12	0x060C	Acceleration ramp time of jog speed	0 ms to 65535 ms	10	ms	Immedi ately	" H06.12" on page 195
H06.13	0x060D	Speed feedforward smoothing filter	0 us to 65535 us	0	us	Immedi ately	" H06.13" on page 195
H06.15	0x060F	Zero clamp speed threshold	0 rpm to 10000 rpm	10	rpm	Immedi ately	" H06.15" on page 196
H06.16	0x0610	Threshold of TGON (motor rotation) signal	0 rpm to 1000 rpm	20	rpm	Immedi ately	" H06.16" on page 196
H06.17	0x0611	Threshold of V-Cmp (speed matching) signal	0 rpm to 100 rpm	10	rpm	Immedi ately	" H06.17" on page 196
H06.18	0x0612	Threshold of speed reach signal	20 rpm to 10000 rpm	1000	rpm	Immedi ately	" H06.18" on page 196

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.19	0x0613	Threshold of zero speed output signal	1 rpm to 10000 rpm	10	rpm	Immediately	" H06.19" on page 197
H06.40	0x0628	Deceleration time of ramp 1	0 ms to 65535 ms	0	ms	Immediately	" H06.40" on page 197
H06.41	0x0629	Deceleration time of ramp 2	0 ms to 65535 ms	0	ms	Immediately	" H06.41" on page 197
H06.50	0x0632	Speed S-curve enable switch	0: Disable 1: Enable	1	-	At stop	" H06.50" on page 197
H06.51	0x0633	Increasing acceleration 1 of speed S-curve acceleration segment	0.0% to 100.0%	50	%	At stop	" H06.51" on page 198
H06.52	0x0634	Decreasing acceleration 1 of speed S-curve acceleration segment	0.0% to 100.0%	50	%	At stop	" H06.52" on page 198
H06.53	0x0635	Decreasing deceleration 1 of speed S-curve deceleration segment	0.0% to 100.0%	50	%	At stop	" H06.53" on page 198
H06.54	0x0636	Decreasing acceleration 1 of speed S-curve deceleration segment	0.0% to 100.0%	50	%	At stop	" H06.54" on page 199
H06.55	0x0637	Increasing acceleration 2 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.55" on page 199

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.56	0x0638	Decreasing acceleration 2 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.56" on page 199
H06.57	0x0639	Decreasing deceleration 2 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.57" on page 199
H06.58	0x063A	Decreasing acceleration 2 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.58" on page 200
H06.59	0x063B	Increasing acceleration 3 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.59" on page 200
H06.60	0x063C	Decreasing acceleration 3 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.60" on page 200
H06.61	0x063D	Decreasing deceleration 3 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.61" on page 201
H06.62	0x063E	Decreasing acceleration 3 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.62" on page 201

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.63	0x063F	Increasing acceleration 4 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.63" on page 201
H06.64	0x0640	Decreasing acceleration 4 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.64" on page 202
H06.65	0x0641	Decreasing deceleration 4 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.65" on page 202
H06.66	0x0642	Decreasing acceleration 4 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.66" on page 202
H06.67	0x0643	Increasing acceleration 5 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.67" on page 203
H06.68	0x0644	Decreasing acceleration 5 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.68" on page 203
H06.69	0x0645	Decreasing deceleration 5 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.69" on page 203

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.70	0x0646	Decreasing acceleration 5 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.70" on page 204
H06.71	0x0647	Increasing acceleration 6 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.71" on page 204
H06.72	0x0648	Decreasing acceleration 6 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.72" on page 204
H06.73	0x0649	Decreasing deceleration 6 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.73" on page 205
H06.74	0x064A	Decreasing acceleration 6 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.74" on page 205
H06.75	0x064B	Increasing acceleration 7 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.75" on page 205
H06.76	0x064C	Decreasing acceleration 7 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.76" on page 206

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H06.77	0x064D	Decreasing deceleration 7 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.77" on page 206
H06.78	0x064E	Decreasing acceleration 7 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.78" on page 206
H06.79	0x064F	Increasing acceleration 8 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.79" on page 207
H06.80	0x0650	Decreasing acceleration 8 of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.80" on page 207
H06.81	0x0651	Decreasing deceleration 8 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.81" on page 207
H06.82	0x0652	Decreasing acceleration 8 of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06.82" on page 208

5.8 Parameter Group H07

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H07.00	0x0700	Source of main torque reference A	0: Keypad (H07.03) 1: AI1	0	-	At stop	" H07.00" on page 208
H07.01	0x0701	Source of auxiliary torque reference B	0: Keypad (H07.03) 1: AI1	1	-	At stop	" H07.01" on page 208
H07.02	0x0702	Torque reference source	0: Source of main torque reference A 1: Source of auxiliary torque reference B 2: Source of A+B 3: Switched between A and B 4: Communication	0	-	At stop	" H07.02" on page 209
H07.03	0x0703	Torque reference set through keypad	-400.0% to 400.0%	0	%	Immediately	" H07.03" on page 209
H07.05	0x0705	Torque reference filter time constant 1	0.00 ms to 30.00 ms	0.5	ms	Immediately	" H07.05" on page 210
H07.06	0x0706	Torque reference filter time constant 2	0.00 ms to 30.00 ms	0.27	ms	Immediately	" H07.06" on page 210
H07.07	0x0707	Torque limit source	0: Positive/Negative internal torque limit 1: Internal or external limit as defined by DI 2: T_LMT 3: T_LMT or external limit as defined by DI (FunIN.16 or FunIN.17) 4: T_LMT or internal limit (FunIN.16 or FunIN.17) as defined by DI	0	-	Immediately	" H07.07" on page 210
H07.08	0x0708	T-LMT selection	1: AI1	1	-	Immediately	" H07.08" on page 210
H07.09	0x0709	Positive internal torque limit	0.0% to 400.0%	350	%	Immediately	" H07.09" on page 211
H07.10	0x070A	Negative internal torque limit	0.0% to 400.0%	350	%	Immediately	" H07.10" on page 211

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H07.11	0x070B	Positive external torque limit	0.0% to 400.0%	350	%	Immediately	" H07.11" on page 211
H07.12	0x070C	Negative external torque limit	0.0% to 400.0%	350	%	Immediately	" H07.12" on page 211
H07.15	0x070F	Emergency-stop torque	0.0% to 400.0%	100	%	Immediately	" H07.15" on page 212
H07.17	0x0711	Speed limit source	0: Internal speed limit 1: V-LMT 2: H07.19 or H07.20 as defined by DI	0	-	Immediately	" H07.17" on page 212
H07.18	0x0712	V-LMT selection	1: AI1	1	-	Immediately	" H07.18" on page 212
H07.19	0x0713	Positive speed limit/Speed limit 1 in torque control	0 rpm to 10000 rpm	3000	rpm	Immediately	" H07.19" on page 212
H07.20	0x0714	Negative speed limit/ Speed limit 2 in torque control	0 rpm to 10000 rpm	3000	rpm	Immediately	" H07.20" on page 213
H07.21	0x0715	Base value for torque reach	0.0% to 400.0%	0	%	Immediately	" H07.21" on page 213
H07.22	0x0716	Threshold of valid torque reach	0.0% to 400.0%	20	%	Immediately	" H07.22" on page 213
H07.23	0x0717	Threshold of invalid torque reach	0.0% to 400.0%	10	%	Immediately	" H07.23" on page 213
H07.24	0x0718	Field weakening depth	60% to 115%	115	%	Immediately	" H07.24" on page 214
H07.25	0x0719	Max. permissible demagnetizing current	0% to 300%	100	%	Immediately	" H07.25" on page 214
H07.26	0x071A	Field weakening selection	0: Disable 1: Enable	1	-	At stop	" H07.26" on page 214
H07.27	0x071B	Field weakening gain	0.001 Hz to 1.000 Hz	0.03	Hz	Immediately	" H07.27" on page 214

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H07.28	0x071C	Speed of field weakening point	0 to 65535	0	-	Unchangeable	" H07.28" on page 215
H07.35	0x0723	Torque non-standard feature enable	bit0: Motor output correction enable bit1: Shield compensation data enable	0	-	At stop	" H07.35" on page 215
H07.36	0x0724	Time constant of low-pass filter 2	0.00 ms to 10.00 ms	0	ms	Immediately	" H07.36" on page 215
H07.37	0x0725	Torque reference filter selection	0: First-order filter 1: Biquad filter	0	-	Immediately	" H07.37" on page 215
H07.38	0x0726	Biquad filter attenuation ratio	0 to 50	16	-	At stop	" H07.38" on page 216
H07.40	0x0728	Speed limit window in the torque control mode	0 ms to 300 ms	10	ms	Immediately	" H07.40" on page 216

5.9 Parameter Group H08

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H08.00	0x0800	Speed loop gain	0.1 Hz to 2000.0 Hz	40	Hz	At once	" H08.00" on page 216
H08.01	0x0801	Speed loop integral time constant	0.15 ms to 512.00 ms	19.89	ms	At once	" H08.01" on page 217
H08.02	0x0802	Position loop gain	0.1 Hz to 2000.0 Hz	64	Hz	At once	" H08.02" on page 217
H08.03	0x0803	2nd speed loop gain	0.1 Hz to 2000.0 Hz	75	Hz	At once	" H08.03" on page 217
H08.04	0x0804	2nd speed loop integral time constant	0.15 ms to 512.00 ms	10.61	ms	At once	" H08.04" on page 218
H08.05	0x0805	2nd position loop gain	0.1 Hz to 2000.0 Hz	120	Hz	At once	" H08.05" on page 218
H08.08	0x0808	2nd gain mode setting	0: Fixed to the 1st gain, switched between P and PI as defined by bit26 of external 60FEh 1: Switched between the 1st and 2nd gain sets as defined by H08.09	1	-	At once	" H08.08" on page 218

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H08.09	0x0809	Gain switchover condition	0: Fixed to the 1st gain set (PS) 1: Switched as defined by bit26 of 60FEh 2: Torque reference too large (PS) 3: Speed reference too large (PS) 4: Speed reference change rate too large (PS) 5: Speed reference low/high speed threshold (PS) 6: Position deviation too large (P) 7: Position reference available (P) 8: Positioning unfinished (P) 9: Actual speed (P) 10: Position reference + Actual speed (P)	0	-	At once	*" H08.09" on page 218*
H08.10	0x080A	Gain switchover delay	0.0 ms to 1000.0 ms	5	ms	At once	*" H08.10" on page 220*
H08.11	0x080B	Gain switchover level	0 to 20000	50	-	At once	*" H08.11" on page 221*
H08.12	0x080C	Gain switchover dead time	0 to 20000	30	-	At once	*" H08.12" on page 221*
H08.13	0x080D	Position gain switchover time	0.0 ms to 1000.0 ms	3	ms	At once	*" H08.13" on page 221*
H08.15	0x080F	Load moment of inertia ratio	0.00 to 120.00	1	-	At once	*" H08.15" on page 222*
H08.17	0x0811	Zero phase delay	0.0 ms to 4.0 ms	0	ms	At once	*" H08.17" on page 222*
H08.18	0x0812	Speed feedforward filter time constant	0.00 ms to 64.00 ms	0.5	ms	At once	*" H08.18" on page 222*
H08.19	0x0813	Speed feedforward gain	0.0% to 100.0%	0	%	At once	*" H08.19" on page 222*
H08.20	0x0814	Torque feedforward filter time constant	0.00 ms to 64.00 ms	0.5	ms	At once	*" H08.20" on page 223*
H08.21	0x0815	Torque feedforward gain	0.0% to 300.0%	0	%	At once	*" H08.21" on page 223*

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H08.22	0x0816	Speed feedback filtering option	0: Inhibited 1: 2 times 2: 4 times 3: 8 times 4: 16 times	0	-	At stop	" H08.22" on page 224
H08.23	0x0817	Cutoff frequency of speed feedback low-pass filter	100 Hz to 8000 Hz	8000	Hz	At once	" H08.23" on page 224
H08.24	0x0818	PDFF control coefficient	0.0% to 200.0%	100	%	At once	" H08.24" on page 224
H08.27	0x081B	Speed observer cutoff frequency	50 Hz to 600 Hz	170	Hz	At once	" H08.27" on page 225
H08.28	0x081C	Speed observer inertia correction coefficient	1% to 1600%	100	%	At once	" H08.28" on page 225
H08.29	0x081D	Speed observer filter time	0.00 ms to 10.00 ms	0.8	ms	At once	" H08.29" on page 225
H08.31	0x081F	Disturbance cutoff frequency	10 Hz to 4000 Hz	600	Hz	At once	" H08.31" on page 226
H08.32	0x0820	Disturbance compensation gain	0% to 100%	0	%	At once	" H08.32" on page 226
H08.33	0x0821	Disturbance observer inertia correction coefficient	1% to 1600%	100	%	At once	" H08.33" on page 226
H08.37	0x0825	Phase modulation for medium-frequency jitter suppression 2	-90° to 90°	0	°	At once	" H08.37" on page 227
H08.38	0x0826	Frequency of medium-frequency jitter suppression 2	0 Hz to 1000 Hz	0	Hz	At once	" H08.38" on page 227

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H08.39	0x0827	Compensation gain of medium-frequency jitter suppression 2	0% to 300%	0	%	At once	" H08.39" on page 227
H08.40	0x0828	Speed observer selection	0: Disable 1: Enable	0	-	At once	" H08.40" on page 227
H08.42	0x082A	Model control selection	0: Disable 1: Enable 2: Dual-inertia model	0	-	At once	" H08.42" on page 228
H08.43	0x082B	Model gain	0.1 to 2000.0	40	-	At once	" H08.43" on page 228
H08.46	0x082E	Feedforward value	0.0 to 102.4	95	-	At once	" H08.46" on page 228
H08.53	0x0835	Medium- and low-frequency jitter suppression frequency 3	0.0 Hz to 300.0 Hz	0	Hz	At once	" H08.53" on page 228
H08.54	0x0836	Medium- and low-frequency jitter suppression compensation 3	0% to 200%	0	%	At once	" H08.54" on page 229
H08.56	0x0838	Medium- and low-frequency jitter suppression phase modulation 3	0% to 600%	100	%	At once	" H08.56" on page 229
H08.59	0x083B	Medium- and low-frequency jitter suppression frequency 4	0.0 Hz to 300.0 Hz	0	Hz	At once	" H08.59" on page 229
H08.60	0x083C	Medium- and low-frequency jitter suppression compensation 4	0% to 200%	0	%	At once	" H08.60" on page 229

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H08.61	0x083D	Medium- and low-frequency jitter suppression phase modulation 4	0% to 600%	100	%	At once	" H08.61" on page 230
H08.62	0x083E	Position loop integral time constant	0.15 to 512.00	512	-	At once	" H08.62" on page 230
H08.63	0x083F	2nd position loop integral time constant	0.15 to 512.00	512	-	At once	" H08.63" on page 230
H08.64	0x0840	Speed observer feedback source	0: Disable 1: Enable	0	-	At once	" H08.64" on page 230
H08.65	0x0841	Zero deviation control selection	0: Disable 1: Enable	0	-	At once	" H08.65" on page 231
H08.66	0x0842	Zero deviation control position average filter	0.0 ms to 320.0 ms	5	ms	At once	" H08.66" on page 231
H08.68	0x0844	Speed feedforward of zero deviation control	0.0% to 100.0%	100	%	At once	" H08.68" on page 231
H08.69	0x0845	Torque feedforward of zero deviation control	0.0% to 100.0%	100	%	At once	" H08.69" on page 232
H08.81	0x0851	Anti-resonance frequency of dual-inertia model	1.0 Hz to 400.0 Hz	20	Hz	At once	" H08.81" on page 232
H08.82	0x0852	Resonance frequency of dual-inertia model	0.0 Hz to 6553.5 Hz	0	Hz	At once	" H08.82" on page 232
H08.83	0x0853	Dual-inertia model gain	0.1/s to 300.0/s	60	1/s	At once	" H08.83" on page 232
H08.84	0x0854	Inertia ratio of dual-inertia model	0.00 to 120.00	1	-	At once	" H08.84" on page 233

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H08.88	0x0858	Speed feedforward value of dual-inertia model	0.0 to 6553.5	100	-	At once	" H08.88" on page 233
H08.89	0x0859	Torque feedforward value of dual-inertia model	0.0 to 6553.5	100	-	At once	" H08.89" on page 233

5.10 Parameter Group H09

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H09.00	0x0900	Gain auto-tuning mode	0: Disabled, manual gain tuning required 1: Enabled, gain parameters generated automatically based on the stiffness level 2: Positioning mode, gain parameters generated automatically based on the stiffness level 3: Interpolation mode+Inertia auto-tuning 4: Normal mode+Inertia auto-tuning 6: Quick positioning mode+Inertia auto-tuning	4	-	Immediately	" H09.00" on page 233
H09.01	0x0901	Stiffness level	0 to 41	15	-	Immediately	" H09.01" on page 234
H09.02	0x0902	Adaptive notch mode	0: Adaptive notch no longer updated; 1: One adaptive notch activated (3rd notch) 2: Two adaptive notches activated (3rd and 4th notches) 3: Resonance point tested only (displayed in H09.24) 4: Adaptive notch cleared, values of 3rd and 4th notches restored to default	3	-	Immediately	" H09.02" on page 234
H09.03	0x0903	Online inertia auto-tuning mode	0: Disabled 1: Enabled, changing slowly 2: Enabled, changing normally 3: Enabled, changing quickly	2	-	Immediately	" H09.03" on page 235

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H09.05	0x0905	Offline inertia auto-tuning mode	0: Bi-directional 1: Unidirectional	1	-	At stop	" H09.05" on page 235
H09.06	0x0906	Maximum speed of inertia auto-tuning	100 rpm to 1000 rpm	500	rpm	At stop	" H09.06" on page 235
H09.07	0x0907	Time constant for accelerating to the max. speed during inertia auto-tuning	20 ms to 800 ms	125	ms	At stop	" H09.07" on page 235
H09.08	0x0908	Interval time after an individual inertia auto-tuning	50 ms to 10000 ms	800	ms	At stop	" H09.08" on page 236
H09.09	0x0909	Number of motor revolutions per inertia auto-tuning	0.00 to 100.00	1	-	Immediately	" H09.09" on page 236
H09.11	0x090B	Vibration threshold	0.0% to 100.0%	5	%	Immediately	" H09.11" on page 236
H09.12	0x090C	Frequency of the 1st notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09.12" on page 237
H09.13	0x090D	Width level of the 1st notch	0 to 20	2	-	Immediately	" H09.13" on page 237
H09.14	0x090E	Depth level of the 1st notch	0 to 99	0	-	Immediately	" H09.14" on page 237
H09.15	0x090F	Frequency of the 2nd notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09.15" on page 238
H09.16	0x0910	Width level of the 2nd notch	0 to 20	2	-	Immediately	" H09.16" on page 238
H09.17	0x0911	Depth level of the 2nd notch	0 to 99	0	-	Immediately	" H09.17" on page 238
H09.18	0x0912	Frequency of the 3rd notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09.18" on page 238
H09.19	0x0913	Width level of the 3rd notch	0 to 20	2	-	Immediately	" H09.19" on page 239
H09.20	0x0914	Depth level of the 3rd notch	0 to 99	0	-	Immediately	" H09.20" on page 239

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H09.21	0x0915	Frequency of the 4th notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09.21" on page 239
H09.22	0x0916	Width level of the 4th notch	0 to 20	2	-	Immediately	" H09.22" on page 239
H09.23	0x0917	Depth level of the 4th notch	0 to 99	0	-	Immediately	" H09.23" on page 240
H09.24	0x0918	Auto-tuned resonance frequency	0 Hz to 5000 Hz	0	Hz	Unchangeable	" H09.24" on page 240
H09.26	0x091A	ITune response	50.0% to 500.0%	100	%	Immediately	" H09.26" on page 240
H09.27	0x091B	ITune mode	0: Disabled 1: ITune mode 1 2: ITune mode 2	0	-	Immediately	" H09.27" on page 240
H09.28	0x091C	Minimum inertia ratio of ITune	0.0% to 80.0%	0	%	Immediately	" H09.28" on page 241
H09.29	0x091D	Maximum inertia ratio of ITune	1.0% to 120.0%	30	%	Immediately	" H09.29" on page 241
H09.32	0x0920	Gravity compensation value	-100% to 100.0%	0	%	Immediately	" H09.32" on page 241
H09.33	0x0921	Positive friction compensation value	0.0% to 100.0%	0	%	Immediately	" H09.33" on page 242
H09.34	0x0922	Negative friction compensation value	-100.0% to 0.0%	0	%	Immediately	" H09.34" on page 242
H09.35	0x0923	Friction compensation speed	0.0 to 20.0	2	-	Immediately	" H09.35" on page 242

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H09.36	0x0924	Friction compensation speed	0: Slow speed mode + Speed reference 1: Slow speed mode + Model speed 2: Slow speed mode + Speed feedback 3: Slow speed mode + Observe speed 16: High speed mode + Speed reference 17: High speed mode + Model speed 18: High speed mode + Speed feedback 19: High speed mode + Observe speed	0	-	Immediately	" H09.36" on page 242
H09.37	0x0925	Vibration monitoring time	0 to 65535	600	-	Immediately	" H09.37" on page 243
H09.38	0x0926	Frequency of low-frequency resonance suppression 1 at the mechanical end	1.0 Hz to 100.0 Hz	100	Hz	Immediately	" H09.38" on page 243
H09.39	0x0927	Low-frequency resonance suppression 1 at the mechanical end	0 to 3	2	-	At stop	" H09.39" on page 243
H09.44	0x092C	Frequency of low-frequency resonance suppression 2 at mechanical load end	0.0 to 100.0	0	-	Immediately	" H09.44" on page 244
H09.45	0x092D	Responsiveness of low-frequency resonance suppression 2 at mechanical load end	0.01 to 5.00	1	-	Immediately	" H09.45" on page 244

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H09.47	0x092F	Width of low-frequency resonance suppression 2 at mechanical load end	0.00 to 2.00	1	-	Immediately	*" H09.47" on page 244*
H09.49	0x0931	Frequency of low-frequency resonance suppression 3 at mechanical load end	0.0 to 100.0	0	-	Immediately	*" H09.49" on page 244*
H09.50	0x0932	Responsiveness of low-frequency resonance suppression 3 at mechanical load end	0.01 to 5.00	1	-	Immediately	*" H09.50" on page 245*
H09.52	0x0934	Width of low-frequency resonance suppression 3 at mechanical load end	0.00 to 2.00	1	-	Immediately	*" H09.52" on page 245*
H09.54	0x0936	Vibration threshold	0.0% to 300.0%	50	%	Immediately	*" H09.54" on page 245*
H09.56	0x0938	Max. overshoot allowed by ETune	0 to 65535	2936	-	Immediately	*" H09.56" on page 245*
H09.57	0x0939	STune resonance suppression switchover frequency	0 Hz to 4000 Hz	900	Hz	Immediately	*" H09.57" on page 246*
H09.58	0x093A	STune resonance suppression reset selection	0: Disable 1: Enable	0	-	Immediately	*" H09.58" on page 246*

5.11 Parameter Group H0A

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0A.00	0x0A00	Power input phase loss protection	0: Enable 1: Disable	0	-	Immediately	" H0A.00" on page 246
H0A.01	0x0A01	Absolute position limit	0: Disabled 1: Enabled 2: Enabled after homing	0	-	Immediately	" H0A.01" on page 247
H0A.04	0x0A04	Motor overload protection gain	50 to 300	100	-	Immediately	" H0A.04" on page 247
H0A.08	0x0A08	Overspeed threshold	0 rpm to 20000 rpm	0	rpm	Immediately	" H0A.08" on page 247
H0A.09	0x0A09	Max. pulse input frequency in position control	100 kHz to 8000 kHz	8000	kHz	At stop	" H0A.09" on page 248
H0A.10	0x0A0A	Threshold of excessive local position deviation	0 to 4294967295	27486951	-	Immediately	" H0A.10" on page 248
H0A.12	0x0A0C	Runaway protection	0: Disable 1: Enable	1	-	Immediately	" H0A.12" on page 248
H0A.17	0x0A11	Reference pulse selection	0: Pulse unit 1: Reference unit	1	-	At stop	" H0A.17" on page 249
H0A.18	0x0A12	IGBT over-temperature threshold	120°C to 175°C	140	°C	Immediately	" H0A.18" on page 249
H0A.19	0x0A13	Filter time constant of touch probe 1	0.00 us to 6.30 us	2	us	Immediately	" H0A.19" on page 249
H0A.20	0x0A14	Filter time constant of touch probe 2	0.00 us to 6.30 us	2	us	Immediately	" H0A.20" on page 250
H0A.23	0x0A17	TZ signal filter time	0 ns to 31 ns	15	25 ns	At stop	" H0A.23" on page 250
H0A.24	0x0A18	Filter time constant of low-speed pulse input pin	0 ns to 255 ns	30	25 ns	At stop	" H0A.24" on page 250

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0A.25	0x0A19	Speed display DO low-pass filter time	0 ms to 5000 ms	0	ms	Immediately	" H0A.25" on page 251
H0A.26	0x0A1A	Motor overload detection	0: Show motor overload warning (E909.0) and fault (E620.0) 1: Hide motor overload warning (E909.0) and fault (E620.0)	0	-	Immediately	" H0A.26" on page 251
H0A.27	0x0A1B	Average filter time for speed display DO	0 ms to 100 ms	50	ms	Immediately	" H0A.27" on page 251
H0A.29	0x0A1D	Fully closed-loop encoder (ABZ) filter time	bit0–bit7: Fully closed loop encoder (ABZ) pulse signal filtering time bit8–bit15: Fully closed loop encoder (ABZ) wire breakage filter time	4111	25 ns	At stop	" H0A.29" on page 251
H0A.30	0x0A1E	Filter time constant of high-speed pulse input pin	0 ns to 255 ns	3	ns	At stop	" H0A.30" on page 252
H0A.32	0x0A20	Motor stall over-temperature protection time window	10 ms to 65535 ms	200	ms	Immediately	" H0A.32" on page 252
H0A.33	0x0A21	Motor stall over-temperature detection	0: Hide 1: Enable	1	-	Immediately	" H0A.33" on page 252
H0A.36	0x0A24	Encoder multi-turn overflow fault selection	0: Not hide 1: Hide	0	-	Immediately	" H0A.36" on page 253
H0A.40	0x0A28	Compensation function selection	bit00: Overtravel compensation 0: Enabled 1: Disabled bit01: Touch probe rising edge compensation 0: Disabled 1: Enabled bit02: Touch probe falling edge compensation 0: Disabled 1: Enabled bit03: Touch probe edge solution 0: New solution 1: Old solution (same as SV660N)	6	-	At stop	" H0A.40" on page 253

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0A.41	0x0A29	Forward position of software position limit	-2147483648 to 2147483647	2147483647	Encoder unit	At stop	" H0A.41" on page 253
H0A.43	0x0A2B	Reverse position of software position limit	-2147483648 to 2147483647	-2147483648	Encoder unit	At stop	" H0A.43" on page 254
H0A.49	0x0A31	Regenerative resistor overtemperature threshold	100°C to 175°C	140	°C	Immediately	" H0A.49" on page 254
H0A.50	0x0A32	Encoder communication fault tolerance threshold	0 to 31	5	-	Immediately	" H0A.50" on page 254
H0A.51	0x0A33	Phase loss detection filter times	3 ms to 36 ms	20	55 ms	Immediately	" H0A.51" on page 255
H0A.52	0x0A34	Encoder temperature protection threshold	0°C to 175°C	125	°C	Immediately	" H0A.52" on page 255
H0A.53	0x0A35	Touch probe DI ON compensation time	–3000 ns to 3000 ns	200	25 ns	Immediately	" H0A.53" on page 255
H0A.54	0x0A36	Touch probe DI OFF compensation time	–3000 ns to 3000 ns	1512	25 ns	Immediately	" H0A.54" on page 255
H0A.55	0x0A37	Runaway current threshold	100.0% to 400.0%	200	%	Immediately	" H0A.55" on page 256
H0A.56	0x0A38	Fault reset delay	0 ms to 60000 ms	10000	ms	Immediately	" H0A.56" on page 256
H0A.57	0x0A39	Runaway speed threshold	1 rpm to 1000 rpm	50	rpm	Immediately	" H0A.57" on page 256
H0A.58	0x0A3A	Runaway speed filter time	0.1 ms to 100.0 ms	2	ms	Immediately	" H0A.58" on page 256

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0A.59	0x0A3B	Runaway protection detection time	10 ms to 1000 ms	30	ms	Immediately	" H0A.59" on page 256
H0A.60	0x0A3C	Black box function mode	0: Disable 1: Any fault 2: Designated fault 3: Triggered based on designated condition	1	-	Immediately	" H0A.60" on page 257
H0A.61	0x0A3D	Designated fault code	0.0 to 6553.5	0	-	Immediately	" H0A.61" on page 257
H0A.62	0x0A3E	Trigger source	0 to 25	0	-	Immediately	" H0A.62" on page 257
H0A.63	0x0A3F	Trigger level	-2147483648 to 2147483647	0	-	Immediately	" H0A.63" on page 258
H0A.65	0x0A41	Trigger level	0: Rising edge 1: Equal 2: Falling edge 3: Edge-triggered	0	-	Immediately	" H0A.65" on page 258
H0A.66	0x0A42	Trigger position	0% to 100%	75	%	Immediately	" H0A.66" on page 258
H0A.67	0x0A43	Sampling frequency	0: Current loop 1: Position loop 2: Main cycle	0	-	Immediately	" H0A.67" on page 258
H0A.70	0x0A46	Overspeed threshold 2	0 rpm to 20000 rpm	0	rpm	Immediately	" H0A.70" on page 259
H0A.71	0x0A47	MS1 motor overload curve switchover	0 to 65535	4098	-	Immediately	" H0A.71" on page 259
H0A.72	0x0A48	Maximum stop time in ramp-to-stop	0 ms to 65535 ms	10000	ms	At stop	" H0A.72" on page 259
H0A.73	0x0A49	STO 24 V disconnection filter time	1 ms to 5 ms	5	ms	Immediately	" H0A.73" on page 260
H0A.74	0x0A4A	Filter time for two inconsistent STO channels	1 ms to 1000 ms	100	ms	Immediately	" H0A.74" on page 260
H0A.75	0x0A4B	Servo OFF delay after STO triggered	0 ms to 25 ms	20	ms	Immediately	" H0A.75" on page 260

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0A.90	0x0A5A	Moving average filter time for speed display values	0 ms to 100 ms	0	ms	Immediately	" H0A.90" on page 260
H0A.91	0x0A5B	Moving average filter time for torque display values	0 ms to 100 ms	0	ms	Immediately	" H0A.91" on page 261
H0A.92	0x0A5C	Moving average filter time for position display values	0 ms to 100 ms	0	ms	Immediately	" H0A.92" on page 261
H0A.93	0x0A5D	Low-pass filter time for voltage display values	0 ms to 250 ms	0	ms	Immediately	" H0A.93" on page 261
H0A.94	0x0A5E	Low-pass filter time for thermal display values	0 ms to 250 ms	0	ms	Immediately	" H0A.94" on page 261

5.12 Parameter Group H0b

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.00	0x0B00	Motor speed actual value	–32767 RPM to +32767 RPM	0	rpm	Unchangeable	" H0b.00" on page 262
H0b.01	0x0B01	Speed reference	–32767 RPM to +32767 RPM	0	rpm	Unchangeable	" H0b.01" on page 262
H0b.02	0x0B02	Internal torque reference	-500.0% to 500.0%	0	%	Unchangeable	" H0b.02" on page 262
H0b.03	0x0B03	Monitored DI status	0 to 65535	0	-	Unchangeable	" H0b.03" on page 263
H0b.05	0x0B05	Monitored DO status	0 to 65535	0	-	Unchangeable	" H0b.05" on page 263

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.07	0x0B07	Absolute position counter	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.07" on page 263
H0b.09	0x0B09	Mechanical angle	0.0° to 360.0°	0	°	Unchangeable	" H0b.09" on page 263
H0b.10	0x0B0A	Electrical angle	0.0° to 360.0°	0	°	Unchangeable	" H0b.10" on page 264
H0b.12	0x0B0C	Average load rate	0.0% to 800.0%	0	%	Unchangeable	" H0b.12" on page 264
H0b.13	0x0B0D	Input reference counter	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.13" on page 264
H0b.15	0x0B0F	Position following error (encoder unit)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.15" on page 265
H0b.17	0x0B11	Feedback pulse counter	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.17" on page 265
H0b.19	0x0B13	Total power-on time	0.0s to 429496729.5s	0	s	Unchangeable	" H0b.19" on page 265
H0b.21	0x0B16	Displayed AI1 voltage	-12.000 V to 12.000 V	0	V	Unchangeable	" H0b.21" on page 266
H0b.24	0x0B18	RMS value of phase current	0.0 A to 6553.5 A	0	A	Unchangeable	" H0b.24" on page 266
H0b.25	0x0B19	Angle obtained upon voltage injection auto-tuning	0.0° to 360.0°	0	°	Unchangeable	" H0b.25" on page 266
H0b.26	0x0B1A	Bus voltage	0.0 V to 6553.5 V	0	V	Unchangeable	" H0b.26" on page 266
H0b.27	0x0B1B	Module temperature	-20°C to 200°C	0	°C	Unchangeable	" H0b.27" on page 267

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.28	0x0B1C	Absolute encoder fault information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b.28" on page 267
H0b.29	0x0B1D	Axis status information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b.29" on page 267
H0b.30	0x0B1E	Axis fault information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b.30" on page 267
H0b.31	0x0B1F	Encoder fault information	0 to 65535	0	-	Immediately	" H0b.31" on page 268
H0b.33	0x0B21	Fault log	0: Present fault 1: Last fault 2: 2nd to last fault 3: 3rd to last fault 4: 4th to last fault 5: 5th to last fault 6: 6th to last fault 7: 7th to last fault 8: 8th to last fault 9: 9th to last fault 10: 10th to last fault 11: 11th to last fault 12: 12th to last fault 13: 13th to last fault 14: 14th to last fault 15: 15th to last fault 16: 16th to last fault 17: 17th to last fault 18: 18th to last fault 19: 19th to last fault	0	-	Immediately	" H0b.33" on page 268
H0b.34	0x0B22	Fault code of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.34" on page 269
H0b.35	0x0B23	Time stamp upon occurrence of the selected fault	0.0s to 429496729.5s	0	s	Unchangeable	" H0b.35" on page 269

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.37	0x0B25	Motor speed upon occurrence of the selected fault	–32767 RPM to +32767 RPM	0	rpm	Unchangeable	" H0b.37" on page 269
H0b.38	0x0B26	Motor phase U current upon occurrence of the selected fault	-3276.7 A to 3276.7 A	0	A	Unchangeable	" H0b.38" on page 269
H0b.39	0x0B27	Motor phase V current upon occurrence of the selected fault	-3276.7 A to 3276.7 A	0	A	Unchangeable	" H0b.39" on page 269
H0b.40	0x0B28	Bus voltage upon occurrence of the selected fault	0.0 V to 6553.5 V	0	V	Unchangeable	" H0b.40" on page 270
H0b.41	0x0B29	DI status upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.41" on page 270
H0b.43	0x0B2B	DO status upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.43" on page 270
H0b.45	0x0B2D	Internal fault code	0 to 65535	0	-	Unchangeable	" H0b.45" on page 270

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.46	0x0B2E	Absolute encoder error information given by FPGA upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.46" on page 271
H0b.47	0x0B2F	System status information given by FPGA upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.47" on page 271
H0b.48	0x0B30	System fault information given by FPGA upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.48" on page 271
H0b.49	0x0B31	Encoder fault information upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.49" on page 271
H0b.51	0x0B33	Internal fault code upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.51" on page 272

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.52	0x0B34	FPGA timeout fault standard bit upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b.52" on page 272
H0b.53	0x0B35	Position following error (reference unit)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.53" on page 272
H0b.55	0x0B37	Motor speed actual value	–2147483648 RPM to +2147483647 RPM	0	rpm	Unchangeable	" H0b.55" on page 273
H0b.57	0x0B39	Bus voltage of the control circuit	0.0 V to 6553.5 V	0	V	Unchangeable	" H0b.57" on page 273
H0b.58	0x0B3A	Mechanical absolute position (low 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.58" on page 273
H0b.60	0x0B3C	Mechanical absolute position (high 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.60" on page 273
H0b.63	0x0B3F	NotRdy state	1: Control circuit error 2: Main circuit power input error 3: Bus undervoltage 4: Soft start failed 5: Encoder initialization undone 6: Short circuit to ground failed 7: Others	0	-	Unchangeable	" H0b.63" on page 274
H0b.64	0x0B40	Real-time input position reference counter	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" H0b.64" on page 274
H0b.66	0x0B42	Encoder temperature	-32768°C to 32767°C	0	°C	Unchangeable	" H0b.66" on page 274
H0b.67	0x0B43	Load rate of regenerative resistor	0.0% to 200.0%	0	%	Unchangeable	" H0b.67" on page 275

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.70	0x0B46	Number of absolute encoder revolutions	0 Rev to 65535 Rev	0	Rev	Unchangeable	" H0b.70" on page 275
H0b.71	0x0B47	Single-turn position fed back by the absolute encoder	0 p to 2147483647 p	0	p	Unchangeable	" H0b.71" on page 275
H0b.74	0x0B4A	System fault information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b.74" on page 275
H0b.77	0x0B4D	Encoder position (low 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.77" on page 275
H0b.79	0x0B4F	Encoder position (high 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.79" on page 276
H0b.81	0x0B51	Single-turn position of the rotary load (low 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.81" on page 276
H0b.83	0x0B53	Single-turn position of the rotary load (high 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.83" on page 276
H0b.85	0x0B55	Single-turn position of the rotary load (reference unit)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b.85" on page 277
H0b.87	0x0B57	IGBT junction temperature	0 to 200	0	-	Unchangeable	" H0b.87" on page 277
H0b.90	0x0B5A	Group No. of the abnormal parameter	0 to 65535	0	-	Unchangeable	" H0b.90" on page 277

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0b.91	0x0B5B	Offset within the group of the abnormal parameter	0 to 65535	0	-	Unchangeable	" H0b.91" on page 277
H0b.93	0x0B5D	Closed loop state	0: Half closed loop 1: Fully closed loop	0	-	Unchangeable	" H0b.93" on page 278
H0b.94	0x0B5E	Individual power-on time	0.0s to 429496729.5s	0	s	Unchangeable	" H0b.94" on page 278
H0b.96	0x0B60	Individual power-on time upon occurrence of the selected fault	0.0s to 429496729.5s	0	s	Unchangeable	" H0b.96" on page 278

5.13 Parameter Group H0d

Param. No.	Address	Name	Setpoint	Default	Unit	Change	Page
H0d.00	0x0D00	Software reset	0: No operation 1: Enable	0	-	At stop	" H0d.00" on page 278
H0d.01	0x0D01	Fault reset	0: No operation 1: Enable	0	-	At stop	" H0d.01" on page 279
H0d.02	0x0D02	Inertia auto-tuning selection	0 to 65	0	-	At once	" H0d.02" on page 279
H0d.04	0x0D04	Read/write in encoder ROM	0: No operation 1: Write ROM 2: Read ROM 3: ROM failure	0	-	At stop	" H0d.04" on page 279
H0d.05	0x0D05	Emergency stop	0: No operation 1: Enable	0	-	At once	" H0d.05" on page 280
H0d.10	0x0D0A	Auto-tuning of analog channel	0: No operation 1: Adjust AI1	0	-	At stop	" H0d.10" on page 280
H0d.12	0x0D0C	Phase U/V current balance correction	0: Disable 1: Enable	0	-	At stop	" H0d.12" on page 280

Param. No.	Address	Name	Setpoint	Default	Unit	Change	Page
H0d.17	0x0D11	Forced DI/DO enable switch	bit 0: Forced DI enable switch 0: Disable 1: Enable bit 1: Forced DO enable switch 0: Disable 1: Enable	0	-	At once	" H0d.17" on page 281
H0d.18	0x0D12	Forced DI value	0 to 255	255	-	At once	" H0d.18" on page 281
H0d.19	0x0D13	Forced DO value	0 to 31	0	-	At once	" H0d.19" on page 281
H0d.20	0x0D14	Absolute encoder reset selection	0: No operation 1: Reset the fault 2: Reset the fault and multi-turn data 3: Reset Inovance 2nd encoder fault 4: Reset Inovance 2nd encoder fault and multi-turn data	0	-	At stop	" H0d.20" on page 282
H0d.23	0x0D17	Torque fluctuation auto-tuning	0 to 1	0	-	At stop	" H0d.23" on page 282
H0d.26	0x0D1A	Brake and dynamic brake started forcibly	0: Disable 1: Dynamic brake deactivated forcibly 2: Brake released forcibly 3: Dynamic brake deactivated and brake released forcibly	0	-	At stop	" H0d.26" on page 282

5.14 Parameter Group H0E

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0E.00	0x0E00	Node address	1 to 127	1	-	At stop	" H0E.00" on page 283
H0E.01	0x0E01	Save objects written through communication to EEPROM	0: Not save 1: Save parameters 2: Save object dictionaries 3: Save parameters and object dictionaries 4: Save object dictionaries written before communication (OP) 255: Determine through H0E03 and H0E04	1	-	Immediately	" H0E.01" on page 283

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0E.03	0x0E03	Save objects written through software (commissioning protocol) to e2prom	0: Do not save 1: Save	1	-	Immediately	" H0E.03" on page 283
H0E.04	0x0E04	Save objects written through communication to e2prom (excluding commissioning protocol)	0: Do not save 1: Save	0	-	Immediately	" H0E.04" on page 284
H0E.10	0x0E0A	CAN selection	0: Pulse/Axis control command 1: Enhanced axis control command	0	-	At stop	" H0E.10" on page 284
H0E.11	0x0E0B	CAN baud rate	0: 20 kbit/s 1: 50 kbit/s 2: 100 kbit/s 3: 125 kbit/s 4: 250 kbit/s 5: 500 kbit/s 7: 1 Mbps	5	-	At stop	" H0E.11" on page 284
H0E.80	0x0E50	Modbus baud rate	0: 300 bps 1: 600 bps 2: 1200 bps 3: 2400 bps 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps 8: 57600 bps 9: 115200 bps	9	-	Immediately	" H0E.80" on page 285
H0E.81	0x0E51	Modbus data format	0: No parity, 2 stop bits (N-2) 1: Even parity, 1 stop bit (E-1) 2: Odd parity, 1 stop bit (O-1) 3: No parity, 1 stop bit (N-1)	3	-	Immediately	" H0E.81" on page 285
H0E.82	0x0E52	Modbus response delay	0 ms to 20 ms	0	ms	Immediately	" H0E.82" on page 286
H0E.83	0x0E53	Modbus communication timeout	0 ms to 600 ms	0	ms	Immediately	" H0E.83" on page 286

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0E.84	0x0E54	Sequence of Modbus communication data bits	0: High bits before low bits 1: Low bits before high bits	1	-	Immediately	" H0E.84" on page 286
H0E.90	0x0E5A	Modbus version	0.00 to 655.35	0	-	Unchangeable	" H0E.90" on page 287
H0E.92	0x0E5C	CANlink version	0.00 to 655.35	0	-	Unchangeable	" H0E.92" on page 287
H0E.97	0x0E61	Communication monitoring parameter 1	0 to 65535	0	-	Immediately	" H0E.97" on page 287
H0E.98	0x0E62	Communication monitoring parameter 2	0 to 65535	0	-	Immediately	" H0E.98" on page 287

5.15 Parameter Group H0F

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0F.00	0x0F00	Encoder feedback mode	0: Internal encoder feedback 1: External encoder feedback 2: Inner/Outer loop switchover	0	-	Immediately	" H0F.00" on page 288
H0F.01	0x0F01	External encoder usage mode	0: Standard operating direction 1: Reverse operating direction	0	-	Immediately	" H0F.01" on page 288
H0F.02	0x0F02	External encoder absolute value	0: Incremental mode 1: Absolute linear mode	0	-	At stop	" H0F.02" on page 289
H0F.03	0x0F03	External encoder feedback type	0: Quadrature pulse	0	-	At stop	" H0F.03" on page 289
H0F.04	0x0F04	External encoder pulses per revolution	0 to 2147483647	10000	-	At stop	" H0F.04" on page 289

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0F.08	0x0F08	Excessive deviation threshold in compound control mode	0 to 2147483647	1000	-	Immediately	" H0F.08" on page 290
H0F.10	0x0F0A	Clear deviation in compound control mode	0 R to 100 R	1	R	Immediately	" H0F.10" on page 290
H0F.13	0x0F0D	Compound vibration suppression filter time	0.0 ms to 6553.5 ms	0	ms	At stop	" H0F.13" on page 291
H0F.16	0x0F10	Pulse deviation display in compound control mode	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" H0F.16" on page 291
H0F.18	0x0F12	Internal position pulse feedback display	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" H0F.18" on page 291
H0F.20	0x0F14	External position pulse feedback display	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" H0F.20" on page 292
H0F.22	0x0F16	External encoder phase Z detection invalid (quadrature pulse feedback)	0: Detected 1: Not detected	0	-	Immediately	" H0F.22" on page 292
H0F.25	0x0F19	Set the source of touch probe Z signal in fully closed-loop mode.	0: Motor Z signal 1: External feedback Z signal	0	-	Immediately	" H0F.25" on page 292

Param. No.	Commu nication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0F.45	0x0F2D	Positioning completed/ Position deviation threshold in fully closed-loop mode	0: Threshold scaled to outer loop unit 1: Same threshold used for inner and outer loops	0	-	At stop	" H0F.45" on page 292
H0F.46	0x0F2E	Fully closed-loop speed feedback selection	0: Internal encoder feedback 1: External encoder feedback	0	-	At stop	" H0F.46" on page 293

5.16 Parameter Group H11

Param. No.	Hexadeci mal Parame ters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.00	2011.01h	Multi-position operation mode	0: Single run (number of displacements selected in H11.01) 1: Cyclic operation (number of displacement selected in H11.01) 2: DI-based operation (selected by DI) 3: Sequential operation 5: Axis-controlled continuous operation	1	-	At stop	" H11.00" on page 293
H11.01	2011.02h	Number of displace ment references in multi-position mode	1 to 16	1	-	At stop	" H11.01" on page 297
H11.02	2011.03h	Starting displace ment No. after pause	0: Continue to execute the unexecuted displacements 1: Start from displacement 1	0	-	At stop	" H11.02" on page 297
H11.03	2011.04h	Interval time unit	0: ms 1: s	0	-	At stop	" H11.03" on page 298
H11.04	2011.05h	Displace ment reference type	0: Relative displacement reference 1: Absolute displacement reference	0	-	Immedi ately	" H11.04" on page 298

Param. No.	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.05	2011.06h	Starting displacement No. in sequential operation	0 to 16	0	-	At stop	" H11.05" on page 299
H11.09	2011.0Ah	Deceleration upon axis control OFF	0 ms to 65535 ms	65535	ms	Immediately	" H11.09" on page 299
H11.10	2011.0Bh	Starting speed of displacement 1	0 rpm to 10000 rpm	0	rpm	Immediately	" H11.10" on page 299
H11.11	2011.0Ch	Stop speed of displacement 1	0 rpm to 10000 rpm	0	rpm	Immediately	" H11.11" on page 300
H11.12	2011.0Dh	Displacement 1	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.12" on page 300
H11.14	2011.0Fh	Max. speed of displacement 1	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.14" on page 300
H11.15	2011.10h	Acc/Dec time of displacement 1	0 ms to 65535 ms	10	ms	Immediately	" H11.15" on page 300
H11.16	2011.11h	Interval time after displacement 1	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.16" on page 301
H11.17	2011.12h	Displacement 2	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.17" on page 301
H11.19	2011.14h	Max. speed of displacement 2	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.19" on page 302
H11.20	2011.15h	Acc/Dec time of displacement 2	0 ms to 65535 ms	10	ms	Immediately	" H11.20" on page 302
H11.21	2011.16h	Interval time after displacement 2	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.21" on page 302

Param. No.	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.22	2011.17h	Displacement 3	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.22" on page 302
H11.24	2011.19h	Max. speed of displacement 3	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.24" on page 303
H11.25	2011.1Ah	Acc/Dec time of displacement 3	0 ms to 65535 ms	10	ms	Immediately	" H11.25" on page 303
H11.26	2011.1Bh	Interval time after displacement 3	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.26" on page 303
H11.27	2011.1Ch	Displacement 4	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.27" on page 303
H11.29	2011.1Eh	Max. speed of displacement 4	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.29" on page 304
H11.30	2011.1Fh	Acc/Dec time of displacement 4	0 ms to 65535 ms	10	ms	Immediately	" H11.30" on page 304
H11.31	2011.20h	Interval time after displacement 4	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.31" on page 304
H11.32	2011.21h	Displacement 5	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.32" on page 304
H11.34	2011.23h	Max. speed of displacement 5	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.34" on page 305
H11.35	2011.24h	Acc/Dec time of displacement 5	0 ms to 65535 ms	10	ms	Immediately	" H11.35" on page 305
H11.36	2011.25h	Interval time after displacement 5	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.36" on page 305

Param. No.	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.37	2011.26h	Displacement 6	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.37" on page 305
H11.39	2011.28h	Max. speed of displacement 6	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.39" on page 306
H11.40	2011.29h	Acc/Dec time of displacement 6	0 ms to 65535 ms	10	ms	Immediately	" H11.40" on page 306
H11.41	2011.2Ah	Interval time after displacement 6	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.41" on page 306
H11.42	2011.2Bh	Displacement 7	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.42" on page 306
H11.44	2011.2Dh	Max. speed of displacement 7	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.44" on page 307
H11.45	2011.2Eh	Acc/Dec time of displacement 7	0 ms to 65535 ms	10	ms	Immediately	" H11.45" on page 307
H11.46	2011.2Fh	Interval time after displacement 7	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.46" on page 307
H11.47	2011.30h	Displacement 8	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.47" on page 307
H11.49	2011.32h	Max. speed of displacement 8	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.49" on page 308
H11.50	2011.33h	Acc/Dec time of displacement 8	0 ms to 65535 ms	10	ms	Immediately	" H11.50" on page 308
H11.51	2011.34h	Interval time after displacement 8	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.51" on page 308

Param. No.	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.52	2011.35h	Displacement 9	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.52" on page 308
H11.54	2011.37h	Max. speed of displacement 9	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.54" on page 309
H11.55	2011.38h	Acc/Dec time of displacement 9	0 ms to 65535 ms	10	ms	Immediately	" H11.55" on page 309
H11.56	2011.39h	Interval time after displacement 9	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.56" on page 309
H11.57	2011.3Ah	Displacement 10	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.57" on page 309
H11.59	2011.3Ch	Max. speed of displacement 10	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.59" on page 310
H11.60	2011.3Dh	Acc/Dec time of displacement 10	0 ms to 65535 ms	10	ms	Immediately	" H11.60" on page 310
H11.61	2011.3Eh	Interval time after displacement 10	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.61" on page 310
H11.62	2011.3Fh	Displacement 11	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.62" on page 310
H11.64	2011.41h	Max. speed of displacement 11	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.64" on page 311
H11.65	2011.42h	Acc/Dec time of displacement 11	0 ms to 65535 ms	10	ms	Immediately	" H11.65" on page 311
H11.66	2011.43h	Interval time after displacement 11	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.66" on page 311

Param. No.	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.67	2011.44h	Displacement 12	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.67" on page 311
H11.69	2011.46h	Max. speed of displacement 12	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.69" on page 312
H11.70	2011.47h	Acc/Dec time of displacement 12	0 ms to 65535 ms	10	ms	Immediately	" H11.70" on page 312
H11.71	2011.48h	Interval time after displacement 12	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.71" on page 312
H11.72	2011.49h	Displacement 13	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.72" on page 312
H11.74	2011.4Bh	Max. speed of displacement 13	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.74" on page 313
H11.75	2011.4Ch	Acc/Dec time of displacement 13	0 ms to 65535 ms	10	ms	Immediately	" H11.75" on page 313
H11.76	2011.4Dh	Interval time after displacement 13	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.76" on page 313
H11.77	2011.4Eh	Displacement 14	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.77" on page 313
H11.79	2011.50h	Max. speed of displacement 14	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.79" on page 314
H11.80	2011.51h	Acc/Dec time of displacement 14	0 ms to 65535 ms	10	ms	Immediately	" H11.80" on page 314
H11.81	2011.52h	Interval time after displacement 14	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.81" on page 314

Param. No.	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H11.82	2011.53h	Displacement 15	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.82" on page 314
H11.84	2011.55h	Max. speed of displacement 15	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.84" on page 315
H11.85	2011.56h	Acc/Dec time of displacement 15	0 ms to 65535 ms	10	ms	Immediately	" H11.85" on page 315
H11.86	2011.57h	Interval time after displacement 15	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.86" on page 315
H11.87	2011.58h	Displacement 16	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11.87" on page 315
H11.89	2011.5Ah	Max. speed of displacement 16	1 rpm to 10000 rpm	200	rpm	Immediately	" H11.89" on page 316
H11.90	2011.5Bh	Acc/Dec time of displacement 16	0 ms to 65535 ms	10	ms	Immediately	" H11.90" on page 316
H11.91	2011.5Ch	Interval time after displacement 16	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11.91" on page 316

5.17 Parameter Group H12

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H12.00	0x1200	Multi-speed operation mode	0: Stop after running for one cycle (number of speeds defined by H12.01) 1: Cyclic operation (number of speeds defined by H12.01) 2: DI-based operation	1	-	At stop	" H12.00" on page 316
H12.01	0x1201	Number of speed references in multi-speed mode	1 to 16	16	-	At stop	" H12.01" on page 318
H12.02	0x1202	Operating time unit	0: s 1: min	0	-	At stop	" H12.02" on page 319
H12.03	0x1203	Acceleration time 1	0 ms to 65535 ms	10	ms	Immediately	" H12.03" on page 319
H12.04	0x1204	Deceleration time 1	0 ms to 65535 ms	10	ms	Immediately	" H12.04" on page 320
H12.05	0x1205	Acceleration time 2	0 ms to 65535 ms	50	ms	Immediately	" H12.05" on page 320
H12.06	0x1206	Deceleration time 2	0 ms to 65535 ms	50	ms	Immediately	" H12.06" on page 320
H12.07	0x1207	Acceleration time 3	0 ms to 65535 ms	100	ms	Immediately	" H12.07" on page 321
H12.08	0x1208	Deceleration time 3	0 ms to 65535 ms	100	ms	Immediately	" H12.08" on page 321
H12.09	0x1209	Acceleration time 4	0 ms to 65535 ms	150	ms	Immediately	" H12.09" on page 321
H12.10	0x120A	Deceleration time 4	0 ms to 65535 ms	150	ms	Immediately	" H12.10" on page 322
H12.20	0x1214	1st speed reference	–10000 RPM to +10000 RPM	0	rpm	Immediately	" H12.20" on page 322
H12.21	0x1215	Operating time of speed 1	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.21" on page 322

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H12.22	0x1216	1st speed rise/drop and curve smoothing parameter time	bit0-bit7: Speed rise and drop time 0: Zero acc and dec time 1: Acc and dec time 1 2: Acc and dec time 2 3: Acc and dec time 3 4: Acc and dec time 4 bit8-bit15: S curve smoothing parameter 1: Smoothing parameter 1 2: Smoothing parameter 2 3: Smoothing parameter 3 4: Smoothing parameter 4 5: Smoothing parameter 5 6: Smoothing parameter 6 7: Smoothing parameter 7 8: Smoothing parameter 8	256	-	Immedi ately	*" H12.22" on page 323*
H12.23	0x1217	Speed reference for speed 2	–10000 RPM to +10000 RPM	100	rpm	Immedi ately	*" H12.23" on page 325*
H12.24	0x1218	Operating time of speed 2	0.0s(m) to 6553.5s(m)	5	s (m)	Immedi ately	*" H12.24" on page 326*
H12.25	0x1219	2nd speed rise/drop and curve smoothing parameter time	See *" H12.22" on page 323* for details.	0	-	Immedi ately	*" H12.25" on page 326*
H12.26	0x121A	3rd speed reference	–10000 RPM to +10000 RPM	300	rpm	Immedi ately	*" H12.26" on page 326*
H12.27	0x121B	Operating time of speed 3	0.0s(m) to 6553.5s(m)	5	s (m)	Immedi ately	*" H12.27" on page 326*
H12.28	0x121C	3rd speed rise/drop and curve smoothing parameter time	See *" H12.22" on page 323* for details.	0	-	Immedi ately	*" H12.28" on page 327*
H12.29	0x121D	Speed reference for speed 4	–10000 RPM to +10000 RPM	500	rpm	Immedi ately	*" H12.29" on page 327*
H12.30	0x121E	Operating time of speed 4	0.0s(m) to 6553.5s(m)	5	s (m)	Immedi ately	*" H12.30" on page 327*

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H12.31	0x121F	4th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.31" on page 327
H12.32	0x1220	Speed reference for speed 5	–10000 RPM to +10000 RPM	700	rpm	Immediately	" H12.32" on page 328
H12.33	0x1221	Operating time of speed 5	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.33" on page 328
H12.34	0x1222	5th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.34" on page 328
H12.35	0x1223	Speed reference for speed 6	–10000 RPM to +10000 RPM	900	rpm	Immediately	" H12.35" on page 328
H12.36	0x1224	Operating time of speed 6	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.36" on page 329
H12.37	0x1225	6th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.37" on page 329
H12.38	0x1226	Speed reference for speed 7	–10000 RPM to +10000 RPM	600	rpm	Immediately	" H12.38" on page 329
H12.39	0x1227	Operating time of speed 7	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.39" on page 329
H12.40	0x1228	7th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.40" on page 330
H12.41	0x1229	Speed reference for speed 8	–10000 RPM to +10000 RPM	300	rpm	Immediately	" H12.41" on page 330

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H12.42	0x122A	8th speed rise/drop and curve smoothing parameter time	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.42" on page 330
H12.43	0x122B	Acceleration/ Deceleration time of speed 8	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.43" on page 330
H12.44	0x122C	Speed reference for speed 9	–10000 RPM to +10000 RPM	100	rpm	Immediately	" H12.44" on page 331
H12.45	0x122D	Operating time of speed 9	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.45" on page 331
H12.46	0x122E	9th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.46" on page 331
H12.47	0x122F	Speed reference for speed 10	–10000 RPM to +10000 RPM	-100	rpm	Immediately	" H12.47" on page 331
H12.48	0x1230	Operating time of speed 10	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.48" on page 332
H12.49	0x1231	10th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.49" on page 332
H12.50	0x1232	Speed reference for speed 11	–10000 RPM to +10000 RPM	-300	rpm	Immediately	" H12.50" on page 332
H12.51	0x1233	Operating time of speed 11	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.51" on page 332

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H12.52	0x1234	11th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.52" on page 333
H12.53	0x1235	Speed reference for speed 12	–10000 RPM to +10000 RPM	-500	rpm	Immediately	" H12.53" on page 333
H12.54	0x1236	Operating time of speed 12	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.54" on page 333
H12.55	0x1237	12th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.55" on page 333
H12.56	0x1238	Speed reference for speed 13	–10000 RPM to +10000 RPM	-700	rpm	Immediately	" H12.56" on page 334
H12.57	0x1239	Operating time of speed 13	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.57" on page 334
H12.58	0x123A	13th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.58" on page 334
H12.59	0x123B	Speed reference for speed 14	–10000 RPM to +10000 RPM	-900	rpm	Immediately	" H12.59" on page 334
H12.60	0x123C	Operating time of speed 14	0.0s(m) to 6553.5s(m)	5	s (m)	Immediately	" H12.60" on page 335
H12.61	0x123D	14th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immediately	" H12.61" on page 335
H12.62	0x123E	Speed reference for speed 15	–10000 RPM to +10000 RPM	-600	rpm	Immediately	" H12.62" on page 335

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H12.63	0x123F	Operating time of speed 15	0.0s(m) to 6553.5s(m)	5	s (m)	Immedi ately	" H12.63" on page 335
H12.64	0x1240	15th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immedi ately	" H12.64" on page 336
H12.65	0x1241	Speed reference for speed 16	–10000 RPM to +10000 RPM	-300	rpm	Immedi ately	" H12.65" on page 336
H12.66	0x1242	Operating time of speed 16	0.0s(m) to 6553.5s(m)	5	s (m)	Immedi ately	" H12.66" on page 336
H12.67	0x1243	16th speed rise/drop and curve smoothing parameter time	See " H12.22" on page 323 for details.	0	-	Immedi ately	" H12.67" on page 336

5.18 Parameter Group H17

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H17.90	0x175A	Communication VDI enabling	0: Disable 1: Enable	0	-	At stop	" H17.90" on page 337
H17.91	0x175B	VDI default value upon power-on	0: No default 1: VDI1 default value 2: VDI2 default value 4: VDI3 default value 8: VDI4 default value 16: VDI5 default value 32: VDI6 default value 64: VDI7 default value 128: VDI8 default value 256: VDI9 default value 512: VDI10 default value 1024: VDI11 default value 2048: VDI12 default value 4096: VDI13 default value 8092: VDI14 default value 16384: VDI15 default value 32768: VDI16 default value	0	-	Immediately	" H17.91" on page 337
H17.00	0x1700	VDI1 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.00" on page 338
H17.01	0x1701	VDI1 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.01" on page 339
H17.02	0x1702	VDI2 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.02" on page 340
H17.03	0x1703	VDI2 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.03" on page 340
H17.04	0x1704	VDI3 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.04" on page 340
H17.05	0x1705	VDI3 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.05" on page 341
H17.06	0x1706	VDI4 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.06" on page 341
H17.07	0x1707	VDI4 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.07" on page 341
H17.08	0x1708	VDI5 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.08" on page 341

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H17.09	0x1709	VDI5 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.09" on page 342
H17.10	0x170A	VDI6 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.10" on page 342
H17.11	0x170B	VDI6 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.11" on page 342
H17.12	0x170C	VDI7 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.12" on page 343
H17.13	0x170D	VDI7 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.13" on page 343
H17.14	0x170E	VDI8 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.14" on page 343
H17.15	0x170F	VDI8 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.15" on page 343
H17.16	0x1710	VDI9 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.16" on page 344
H17.17	0x1711	VDI9 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.17" on page 344
H17.18	0x1712	VDI10 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.18" on page 344
H17.19	0x1713	VDI10 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.19" on page 345
H17.20	0x1714	VDI11 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.20" on page 345
H17.21	0x1715	VDI11 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.21" on page 345
H17.22	0x1716	VDI12 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.22" on page 345
H17.23	0x1717	VDI12 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.23" on page 346
H17.24	0x1718	VDI13 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.24" on page 346

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H17.25	0x1719	VDI13 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.25" on page 346
H17.26	0x171A	VDI14 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.26" on page 347
H17.27	0x171B	VDI14 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.27" on page 347
H17.28	0x171C	VDI15 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.28" on page 347
H17.29	0x171D	VDI15 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.29" on page 347
H17.30	0x171E	VDI16 function selection	See " H17.00" on page 338 for details.	0	-	Immediately	" H17.30" on page 348
H17.31	0x171F	VDI16 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	" H17.31" on page 348
H17.92	0x175C	Communication VDO enabling	0: Disable 1: Enable	0	-	At stop	" H17.92" on page 348
H17.93	0x175D	VDO default value upon power-on	0: No default 1: VDO1 default value 2: VDO2 default value 4: VDO3 default value 8: VDO4 default value 16: VDO5 default value 32: VDO6 default value 64: VDO7 default value 128: VDO8 default value 256: VDO9 default value 512: VDO10 default value 1024: VDO11 default value 2048: VDO12 default value 4096: VDO13 default value 8192: VDO14 default value 16384: VDO15 default value 32768: VDO16 default value	0	-	At stop	" H17.93" on page 349
H17.32	0x1720	VDO virtual level	0 to 65535	0	-	Unchangeable	" H17.32" on page 349
H17.33	0x1721	VDO1 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.33" on page 350

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H17.34	0x1722	VDO1 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.34" on page 351
H17.35	0x1723	VDO2 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.35" on page 351
H17.36	0x1724	VDO2 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.36" on page 351
H17.37	0x1725	VDO3 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.37" on page 351
H17.38	0x1726	VDO3 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.38" on page 352
H17.39	0x1727	VDO4 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.39" on page 352
H17.40	0x1728	VDO4 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.40" on page 352
H17.41	0x1729	VDO5 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.41" on page 353
H17.42	0x172A	VDO5 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.42" on page 353
H17.43	0x172B	VDO6 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.43" on page 353
H17.44	0x172C	VDO6 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.44" on page 353
H17.45	0x172D	VDO7 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.45" on page 354
H17.46	0x172E	VDO7 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.46" on page 354
H17.47	0x172F	VDO8 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.47" on page 354
H17.48	0x1730	VDO8 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.48" on page 355
H17.49	0x1731	VDO9 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.49" on page 355
H17.50	0x1732	VDO9 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.50" on page 355
H17.51	0x1733	VDO10 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.51" on page 355

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H17.52	0x1734	VDO10 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.52" on page 356
H17.53	0x1735	VDO11 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.53" on page 356
H17.54	0x1736	VDO11 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.54" on page 356
H17.55	0x1737	VDO12 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.55" on page 357
H17.56	0x1738	VDO12 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.56" on page 357
H17.57	0x1739	VDO13 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.57" on page 357
H17.58	0x173A	VDO13 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.58" on page 357
H17.59	0x173B	VDO14 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.59" on page 358
H17.60	0x173C	VDO14 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.60" on page 358
H17.61	0x173D	VDO15 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.61" on page 358
H17.62	0x173E	VDO15 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.62" on page 359
H17.63	0x173F	VDO16 function selection	See " H17.33" on page 350 for details.	0	-	Immediately	" H17.63" on page 359
H17.64	0x1740	VDO16 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17.64" on page 359

5.19 Parameter Group H18

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H18.00	0x1800	Position comparison output selection	0: Disable 1: Enable (rising edge-triggered)	0	-	Immediately	" H18.00" on page 359
H18.01	0x1801	Position comparison output feedback source	0: Motor encoder feedback 1: Fully closed-loop position feedback	0	-	Immediately	" H18.01" on page 360
H18.02	0x1802	Position comparison resolution	0: 24-bit 1: 23-bit 2: 22-bit 3: 21-bit 4: 20-bit 5: 19-bit 6: 18-bit 7: 17-bit	0	-	Immediately	" H18.02" on page 360
H18.03	0x1803	Position comparison mode	0: Individual comparison mode 1: Cyclic comparison mode 2: Fixed cyclic comparison mode	0	-	Immediately	" H18.03" on page 360
H18.04	0x1804	Current position as zero	0: Disable 1: Enable (rising edge-triggered) Note: This function needs to be used when the comparison state is inactive, otherwise the comparison logic may malfunction.	0	-	Immediately	" H18.04" on page 361
H18.05	0x1805	Position comparison output width	0.1 ms to 204.7 ms	0.1	ms	Immediately	" H18.05" on page 361
H18.06	0x1806	Position comparison output ABZ port polarity	Bit 0: OCZ output logic 0: Positive, output high level upon active logic 1: Negative, output low level upon active logic Bit 1: Z port output logic 0: Positive, output high level upon active logic 1: Negative, output low level upon active logic bit2: A/B output logic 0: Positive, output high level upon active logic 1: Negative, output low level upon active logic	0	-	Immediately	" H18.06" on page 361

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H18.07	0x1807	Start point of position comparison	0 to 40	0	-	Immedi ately	" H18.07" on page 362
H18.08	0x1808	End point of position comparison	0 to 40	0	-	Immedi ately	" H18.08" on page 362
H18.09	0x1809	Current status of position comparison	0 to 1024	0	-	Unchange able	" H18.09" on page 362
H18.10	0x180A	Real-time position of position comparison	-2147483648 to 2147483647	0	-	Unchange able	" H18.10" on page 363
H18.12	0x180C	Zero offset of position comparison	-2147483648 to 2147483647	0	-	Immedi ately	" H18.12" on page 363
H18.14	0x180E	Position comparison output delay compensa tion	–12.00 µs to +12.00 µs	0	us	Immedi ately	" H18.14" on page 363
H18.15	0x180F	Fixed cyclic comparison	1 to 65535	1	-	Immedi ately	" H18.15" on page 363
H18.16	0x1810	ABZ output function setting	Bit 0: OCZ output function 0: Frequency-division output 1: Position comparison Bit 1: Z port output function 0: Frequency-division output 1: Position comparison bit2: A/B port output function 0: Frequency-division output 1: Position comparison	0	-	Immedi ately	" H18.16" on page 364
H18.17	0x1811	Number of fixed mode cycles	0 to 65535	1	-	Unchange able	" H18.17" on page 364

5.20 Parameter Group H19

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.00	0x1900	Target value of position comparison 1	-2147483648 to 2147483647	0	-	Immediately	" H19.00" on page 365
H19.02	0x1902	Attribute value of position comparison 1	Bit 0: Current position changes from "less than" to "more than" the comparison point Bit 1: Current position changes from "more than" to "less than" the comparison point bit2 to bit6: Reserved bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: DO5 output bit12: Frequency-division A output bit13: Frequency-division B output bit14: Frequency-division Z output bit15: Frequency-division OCZ output	0	-	Immediately	" H19.02" on page 365
H19.03	0x1903	Target value of position comparison 2	-2147483648 to 2147483647	0	-	Immediately	" H19.03" on page 366
H19.05	0x1905	Attribute value of position comparison 2	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.05" on page 366
H19.06	0x1906	Target value of position comparison 3	-2147483648 to 2147483647	0	-	Immediately	" H19.06" on page 366
H19.08	0x1908	Attribute value of position comparison 3	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.08" on page 366
H19.09	0x1909	Target value of position comparison 4	-2147483648 to 2147483647	0	-	Immediately	" H19.09" on page 366
H19.11	0x190B	Attribute value of position comparison 4	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.11" on page 367

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.12	0x190C	Target value of position comparison 5	-2147483648 to 2147483647	0	-	Immediately	" H19.12" on page 367
H19.14	0x190E	Attribute value of position comparison 5	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.14" on page 367
H19.15	0x190F	Target value of position comparison 6	-2147483648 to 2147483647	0	-	Immediately	" H19.15" on page 367
H19.17	0x1911	Attribute value of position comparison 6	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.17" on page 368
H19.18	0x1912	Target value of position comparison 7	-2147483648 to 2147483647	0	-	Immediately	" H19.18" on page 368
H19.20	0x1914	Attribute value of position comparison 7	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.20" on page 368
H19.21	0x1915	Target value of position comparison 8	-2147483648 to 2147483647	0	-	Immediately	" H19.21" on page 368
H19.23	0x1917	Attribute value of position comparison 8	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.23" on page 369
H19.24	0x1918	Target value of position comparison 9	-2147483648 to 2147483647	0	-	Immediately	" H19.24" on page 369
H19.26	0x191A	Attribute value of position comparison 9	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.26" on page 369
H19.27	0x191B	Target value of position comparison 10	-2147483648 to 2147483647	0	-	Immediately	" H19.27" on page 369
H19.29	0x191D	Attribute value of position comparison 10	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.29" on page 370

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.30	0x191E	Target value of position comparison 11	-2147483648 to 2147483647	0	-	Immediately	" H19.30" on page 370
H19.32	0x1920	Attribute value of position comparison 11	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.32" on page 370
H19.33	0x1921	Target value of position comparison 12	-2147483648 to 2147483647	0	-	Immediately	" H19.33" on page 370
H19.35	0x1923	Attribute value of position comparison 12	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.35" on page 371
H19.36	0x1924	Target value of position comparison 13	-2147483648 to 2147483647	0	-	Immediately	" H19.36" on page 371
H19.38	0x1926	Attribute value of position comparison 13	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.38" on page 371
H19.39	0x1927	Target value of position comparison 14	-2147483648 to 2147483647	0	-	Immediately	" H19.39" on page 371
H19.41	0x1929	Attribute value of position comparison 14	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.41" on page 372
H19.42	0x192A	Target value of position comparison 15	-2147483648 to 2147483647	0	-	Immediately	" H19.42" on page 372
H19.44	0x192C	Attribute value of position comparison 15	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.44" on page 372

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.45	0x192D	Target value of position comparison 16	-2147483648 to 2147483647	0	-	Immediately	" H19.45" on page 372
H19.47	0x192F	Attribute value of position comparison 16	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.47" on page 373
H19.48	0x1930	Target value of position comparison 17	-2147483648 to 2147483647	0	-	Immediately	" H19.48" on page 373
H19.50	0x1932	Attribute value of position comparison 17	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.50" on page 373
H19.51	0x1933	Target value of position comparison 18	-2147483648 to 2147483647	0	-	Immediately	" H19.51" on page 373
H19.53	0x1935	Attribute value of position comparison 18	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.53" on page 374
H19.54	0x1936	Target value of position comparison 19	-2147483648 to 2147483647	0	-	Immediately	" H19.54" on page 374
H19.56	0x1938	Attribute value of position comparison 19	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.56" on page 374
H19.57	0x1939	Target value of position comparison 20	-2147483648 to 2147483647	0	-	Immediately	" H19.57" on page 374
H19.59	0x193B	Attribute value of position comparison 20	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.59" on page 375

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.60	0x193C	Target value of position comparison 21	-2147483648 to 2147483647	0	-	Immediately	*" H19.60" on page 375*
H19.62	0x193E	Attribute value of position comparison 21	See *" H19.02" on page 365* for details.	0	-	Immediately	*" H19.62" on page 375*
H19.63	0x193F	Target value of position comparison 22	-2147483648 to 2147483647	0	-	Immediately	*" H19.63" on page 375*
H19.65	0x1941	Attribute value of position comparison 22	See *" H19.02" on page 365* for details.	0	-	Immediately	*" H19.65" on page 376*
H19.66	0x1942	Target value of position comparison 23	-2147483648 to 2147483647	0	-	Immediately	*" H19.66" on page 376*
H19.68	0x1944	Attribute value of position comparison 23	See *" H19.02" on page 365* for details.	0	-	Immediately	*" H19.68" on page 376*
H19.69	0x1945	Target value of position comparison 24	-2147483648 to 2147483647	0	-	Immediately	*" H19.69" on page 376*
H19.71	0x1947	Attribute value of position comparison 24	See *" H19.02" on page 365* for details.	0	-	Immediately	*" H19.71" on page 377*
H19.72	0x1948	Target value of position comparison 25	-2147483648 to 2147483647	0	-	Immediately	*" H19.72" on page 377*
H19.74	0x194A	Attribute value of position comparison 25	See *" H19.02" on page 365* for details.	0	-	Immediately	*" H19.74" on page 377*

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.75	0x194B	Target value of position comparison 26	-2147483648 to 2147483647	0	-	Immediately	" H19.75" on page 377
H19.77	0x194D	Attribute value of position comparison 26	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.77" on page 378
H19.78	0x194E	Target value of position comparison 27	-2147483648 to 2147483647	0	-	Immediately	" H19.78" on page 378
H19.80	0x1950	Attribute value of position comparison 27	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.80" on page 378
H19.81	0x1951	Target value of position comparison 28	-2147483648 to 2147483647	0	-	Immediately	" H19.81" on page 378
H19.83	0x1953	Attribute value of position comparison 28	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.83" on page 379
H19.84	0x1954	Target value of position comparison 29	-2147483648 to 2147483647	0	-	Immediately	" H19.84" on page 379
H19.86	0x1956	Attribute value of position comparison 29	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.86" on page 379
H19.87	0x1957	Target value of position comparison 30	-2147483648 to 2147483647	0	-	Immediately	" H19.87" on page 379
H19.89	0x1959	Attribute value of position comparison 30	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.89" on page 380

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.90	0x195A	Target value of position comparison 31	-2147483648 to 2147483647	0	-	Immediately	" H19.90" on page 380
H19.92	0x195C	Attribute value of position comparison 31	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.92" on page 380
H19.93	0x195D	Target value of position comparison 32	-2147483648 to 2147483647	0	-	Immediately	" H19.93" on page 380
H19.95	0x195F	Attribute value of position comparison 32	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.95" on page 381
H19.96	0x1960	Target value of position comparison 33	-2147483648 to 2147483647	0	-	Immediately	" H19.96" on page 381
H19.98	0x1962	Attribute value of position comparison 33	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.98" on page 381
H19.99	0x1963	Target value of position comparison 34	-2147483648 to 2147483647	0	-	Immediately	" H19.99" on page 381
H19.101	0x1965	Attribute value of position comparison 34	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.101" on page 382
H19.102	0x1966	Target value of position comparison 35	-2147483648 to 2147483647	0	-	Immediately	" H19.102" on page 382
H19.104	0x1968	Attribute value of position comparison 35	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.104" on page 382

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H19.105	0x1969	Target value of position comparison 36	-2147483648 to 2147483647	0	-	Immediately	" H19.105" on page 382
H19.107	0x196B	Attribute value of position comparison 36	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.107" on page 383
H19.108	0x196C	Target value of position comparison 37	-2147483648 to 2147483647	0	-	Immediately	" H19.108" on page 383
H19.110	0x196E	Attribute value of position comparison 37	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.110" on page 383
H19.111	0x196F	Target value of position comparison 38	-2147483648 to 2147483647	0	-	Immediately	" H19.111" on page 383
H19.113	0x1971	Attribute value of position comparison 38	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.113" on page 384
H19.114	0x1972	Target value of position comparison 39	-2147483648 to 2147483647	0	-	Immediately	" H19.114" on page 384
H19.116	0x1974	Attribute value of position comparison 39	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.116" on page 384
H19.117	0x1975	Target value of position comparison 40	-2147483648 to 2147483647	0	-	Immediately	" H19.117" on page 384
H19.119	0x1977	Attribute value of position comparison 40	See " H19.02" on page 365 for details.	0	-	Immediately	" H19.119" on page 385

5.21 Parameter Group H1F

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H1F.90	0x1F5A	DI function state 1 read through communication	0 to 65535	0	-	Unchangeable	" H1F.90" on page 385
H1F.91	0x1F5B	DI function state 2 read through communication	0 to 65535	0	-	Unchangeable	" H1F.91" on page 385
H1F.92	0x1F5C	DI function state 3 read through communication	0 to 65535	0	-	Unchangeable	" H1F.92" on page 386
H1F.93	0x1F5D	DI function state 4 read through communication	0 to 65535	0	-	Unchangeable	" H1F.93" on page 386
H1F.94	0x1F5E	DO function state 1 read through communication	0 to 65535	0	-	Unchangeable	" H1F.94" on page 386
H1F.95	0x1F5F	DO function state 2 read through communication	0 to 65535	0	-	Unchangeable	" H1F.95" on page 387
H1F.96	0x1F60	DO function state 3 read through communication	0 to 65535	0	-	Unchangeable	" H1F.96" on page 387
H1F.97	0x1F61	DO function state 4 read through communication	0 to 65535	0	-	Unchangeable	" H1F.97" on page 388

5.22 Parameter Group H22

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H22.00	0x2200	Process segment command trigger	0 to 1000	0	-	Immediately	" H22.00" on page 388
H22.01	0x2201	Process segment triggered by the event rising edge	0 to 65535	0	-	Immediately	" H22.01" on page 389
H22.02	0x2202	Process segment triggered by the event falling edge	0 to 65535	0	-	Immediately	" H22.02" on page 389
H22.03	0x2203	Acceleration/ Deceleration time upon process segment pause	0: Acceleration/Deceleration time 1: Acceleration/Deceleration time 1 2: Acceleration/Deceleration time 2 3: Acceleration/Deceleration time 3 4: Acceleration/Deceleration time 4 5: Acceleration/Deceleration time 5 6: Acceleration/Deceleration time 6 7: Acceleration/Deceleration time 7	0	-	Immediately	" H22.03" on page 390
H22.04	0x2204	Positive software position limit	-2147483648 to 2147483647	2147483647	Reference unit	Immediately	" H22.04" on page 390
H22.06	0x2206	Negative software position limit	-2147483648 to 2147483647	-2147483648	Reference unit	Immediately	" H22.06" on page 391
H22.08	0x2208	Process segment number	0 to 65535	0	-	Unchangeable	" H22.08" on page 391
H22.19	0x2213	Target speed	0.1 rpm to 6000.0 rpm	50	rpm	Immediately	" H22.19" on page 391
H22.20	0x2214	Target speed 1	0.1 rpm to 6000.0 rpm	200	rpm	Immediately	" H22.20" on page 392
H22.21	0x2215	Target speed 2	0.1 rpm to 6000.0 rpm	500	rpm	Immediately	" H22.21" on page 392
H22.22	0x2216	Target speed 3	0.1 rpm to 6000.0 rpm	1000	rpm	Immediately	" H22.22" on page 392
H22.23	0x2217	Target speed 4	0.1 rpm to 6000.0 rpm	1500	rpm	Immediately	" H22.23" on page 392

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H22.24	0x2218	Target speed 5	0.1 rpm to 6000.0 rpm	2000	rpm	Immediately	" H22.24" on page 393
H22.25	0x2219	Target speed 6	0.1 rpm to 6000.0 rpm	2500	rpm	Immediately	" H22.25" on page 393
H22.26	0x221A	Target speed 7	0.1 rpm to 6000.0 rpm	3000	rpm	Immediately	" H22.26" on page 393
H22.35	0x2223	Acceleration/ Deceleration time	0 ms to 65535 ms	50	ms	Immediately	" H22.35" on page 393
H22.36	0x2224	Acceleration/ Deceleration time 1	0 ms to 65535 ms	200	ms	Immediately	" H22.36" on page 394
H22.37	0x2225	Acceleration/ Deceleration time 2	0 ms to 65535 ms	500	ms	Immediately	" H22.37" on page 394
H22.38	0x2226	Acceleration/ Deceleration time 3	0 ms to 65535 ms	1000	ms	Immediately	" H22.38" on page 394
H22.39	0x2227	Acceleration/ Deceleration time 4	0 ms to 65535 ms	1500	ms	Immediately	" H22.39" on page 394
H22.40	0x2228	Acceleration/ Deceleration time 5	0 ms to 65535 ms	2000	ms	Immediately	" H22.40" on page 395
H22.41	0x2229	Acceleration/ Deceleration time 6	0 ms to 65535 ms	2500	ms	Immediately	" H22.41" on page 395
H22.42	0x222A	Acceleration/ Deceleration time 7	0 ms to 65535 ms	3000	ms	Immediately	" H22.42" on page 395
H22.51	0x2233	Delay after completion of the process segment	0 ms to 65535 ms	0	ms	Immediately	" H22.51" on page 395
H22.52	0x2234	Delay time 1 after completion of the process segment	0 ms to 65535 ms	50	ms	Immediately	" H22.52" on page 396
H22.53	0x2235	Delay time 2 after completion of the process segment	0 ms to 65535 ms	200	ms	Immediately	" H22.53" on page 396

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H22.54	0x2236	Delay time 3 after completion of the process segment	0 ms to 65535 ms	500	ms	Immediately	" H22.54" on page 396
H22.55	0x2237	Delay time 4 after completion of the process segment	0 ms to 65535 ms	1000	ms	Immediately	" H22.55" on page 396
H22.56	0x2238	Delay time 5 after completion of the process segment	0 ms to 65535 ms	1500	ms	Immediately	" H22.56" on page 397
H22.57	0x2239	Delay time 6 after completion of the process segment	0 ms to 65535 ms	2000	ms	Immediately	" H22.57" on page 397
H22.58	0x223A	Delay time 7 after completion of the process segment	0 ms to 65535 ms	3000	ms	Immediately	" H22.58" on page 397
H22.70	0x2246	Homing mode	-32768 to 32767	-2	-	Immediately	" H22.70" on page 397
H22.71	0x2247	Speed in high-speed searching for the home switch signal	0 rpm to 3000 rpm	100	rpm	Immediately	" H22.71" on page 398
H22.72	0x2248	Speed in low-speed searching for the home switch signal	0 rpm to 1000 rpm	10	rpm	Immediately	" H22.72" on page 398
H22.73	0x2249	Acceleration/ Deceleration time during homing	0 ms to 1000 ms	1000	ms	Immediately	" H22.73" on page 398
H22.74	0x224A	Homing time limit	0 ms to 65535 ms	10000	ms	Immediately	" H22.74" on page 399

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H22.75	0x224B	Mechanical home offset	–2147483648 to +2147483647	0	Reference unit	Immediately	" H22.75" on page 399
H22.79	0x224F	Relative/ Absolute homing	0 to 65535	0	-	Immediately	" H22.79" on page 399

5.23 Parameter Group H23

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H23.00	0x2300	Definition of homing	0 to 4294967295	0	-	Immediately	" H23.00" on page 400
H23.02	0x2302	Homing data	-2147483648 to 2147483647	0	-	Immediately	" H23.02" on page 400
H23.04	0x2304	Definition of process segment 1	0 to 4294967295	0	-	Immediately	" H23.04" on page 400
H23.06	0x2306	Data of process segment 1	-2147483648 to 2147483647	0	-	Immediately	" H23.06" on page 401
H23.08	0x2308	Definition of process segment 2	0 to 4294967295	0	-	Immediately	" H23.08" on page 401
H23.10	0x230A	Data of process segment 2	-2147483648 to 2147483647	0	-	Immediately	" H23.10" on page 401
H23.12	0x230C	Definition of process segment 3	0 to 4294967295	0	-	Immediately	" H23.12" on page 401
H23.14	0x230E	Data of process segment 3	-2147483648 to 2147483647	0	-	Immediately	" H23.14" on page 402
H23.16	0x2310	Definition of process segment 4	0 to 4294967295	0	-	Immediately	" H23.16" on page 402
H23.18	0x2312	Data of process segment 4	-2147483648 to 2147483647	0	-	Immediately	" H23.18" on page 402
H23.20	0x2314	Definition of process segment 5	0 to 4294967295	0	-	Immediately	" H23.20" on page 402

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H23.22	0x2316	Data of process segment 5	-2147483648 to 2147483647	0	-	Immediately	" H23.22" on page 402
H23.24	0x2318	Definition of process segment 6	0 to 4294967295	0	-	Immediately	" H23.24" on page 403
H23.26	0x231A	Data of process segment 6	-2147483648 to 2147483647	0	-	Immediately	" H23.26" on page 403
H23.28	0x231C	Definition of process segment 7	0 to 4294967295	0	-	Immediately	" H23.28" on page 403
H23.30	0x231E	Data of process segment 7	-2147483648 to 2147483647	0	-	Immediately	" H23.30" on page 403
H23.32	0x2320	Definition of process segment 8	0 to 4294967295	0	-	Immediately	" H23.32" on page 404
H23.34	0x2322	Data of process segment 8	-2147483648 to 2147483647	0	-	Immediately	" H23.34" on page 404
H23.36	0x2324	Definition of process segment 9	0 to 4294967295	0	-	Immediately	" H23.36" on page 404
H23.38	0x2326	Data of process segment 9	-2147483648 to 2147483647	0	-	Immediately	" H23.38" on page 404
H23.40	0x2328	Definition of process segment 10	0 to 4294967295	0	-	Immediately	" H23.40" on page 405
H23.42	0x232A	Data of process segment 10	-2147483648 to 2147483647	0	-	Immediately	" H23.42" on page 405
H23.44	0x232C	Definition of process segment 11	0 to 4294967295	0	-	Immediately	" H23.44" on page 405
H23.46	0x232E	Data of process segment 11	-2147483648 to 2147483647	0	-	Immediately	" H23.46" on page 405
H23.48	0x2330	Definition of process segment 12	0 to 4294967295	0	-	Immediately	" H23.48" on page 406

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H23.50	0x2332	Data of process segment 12	-2147483648 to 2147483647	0	-	Immediately	" H23.50" on page 406
H23.52	0x2334	Definition of process segment 13	0 to 4294967295	0	-	Immediately	" H23.52" on page 406
H23.54	0x2336	Data of process segment 13	-2147483648 to 2147483647	0	-	Immediately	" H23.54" on page 406
H23.56	0x2338	Definition of process segment 14	0 to 4294967295	0	-	Immediately	" H23.56" on page 407
H23.58	0x233A	Data of process segment 14	-2147483648 to 2147483647	0	-	Immediately	" H23.58" on page 407
H23.60	0x233C	Definition of process segment 15	0 to 4294967295	0	-	Immediately	" H23.60" on page 407
H23.62	0x233E	Data of process segment 15	-2147483648 to 2147483647	0	-	Immediately	" H23.62" on page 407

5.24 Parameter Group H30

Param. No.	Comm. Address	Name	Setpoint	Default	Unit	Change	Page
H30.00	0x3000	Servo status read through communication	0 to 65535	0	-	Unchangeable	" H30.00" on page 408
H30.01	0x3001	DO function state 1 read through communication	0 to 65535	0	-	Unchangeable	" H30.01" on page 408
H30.02	0x3002	DO function state 2 read through communication	0 to 65535	0	-	Unchangeable	" H30.02" on page 408
H30.03	0x3003	Input pulse reference sampling value read through communication	0 to 65535	0	-	Unchangeable	" H30.03" on page 409

5.25 Parameter Group H31

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H31.00	0x3100	VDI virtual level set through communication	0 to 65535	0	-	Immediately	" H31.00" on page 409
H31.04	0x3104	DO state set through communication	0 to 65535	0	-	Immediately	" H31.04" on page 410
H31.05	0x3105	AO set through communication	-10000 mV to 10000 mV	0	mV	Immediately	" H31.05" on page 410
H31.09	0x3109	Speed reference set through communication	–10000 RPM to +10000 RPM	0	rpm	Immediately	" H31.09" on page 410
H31.11	0x310B	Torque reference set through communication	-100.000% to 100.000%	0	%	Immediately	" H31.11" on page 410

5.26 Parameter Group 1000h

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
1000h	-	Device type	-	0x20192	-	Unchangeable	" 1000h" on page 411
1005h	0x2D00	SYNC message COB-ID	128 to 4294967295	128	-	Immediately	" 1005h" on page 411
1006h	0x2D02	Synchronization cycle	0us to 2147483647us	0	us	Immediately	" 1006h" on page 411
1008h	-	Device manufacturer name	-	SV680C	-	Unchangeable	" 1008h" on page 412
100Ch	0x2D04	Node guarding time	0 ms to 65535 ms	0	ms	Immediately	" 100Ch" on page 412

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
100dh	0x2D05	Life factor	0 to 255	0	-	Immediately	" 100dh" on page 412
1014h	0x2D06	Emergency message COB-ID	0 to 4294967295	0	-	Immediately	" 1014h" on page 412
1016.01h	0x2D08	Consumer heartbeat time 1	0 to 2147483647	0	-	Immediately	" 1016.01h" on page 413
1016.02h	0x2D0A	Consumer heartbeat time 2	0 to 2147483647	0	-	Immediately	" 1016.02h" on page 413
1016.03h	0x2D0C	Consumer heartbeat time 3	0 to 2147483647	0	-	Immediately	" 1016.03h" on page 413
1016.04h	0x2D0E	Consumer heartbeat time 4	0 to 2147483647	0	-	Immediately	" 1016.04h" on page 414
1016.05h	0x2D10	Consumer heartbeat time 5	0 to 2147483647	0	-	Immediately	" 1016.05h" on page 414
1017h	0x2D12	Producer heartbeat time	0 ms to 65535 ms	0	ms	Immediately	" 1017h" on page 414
1018.01h	-	Vendor ID	-	0x3B9	-	Unchangeable	" 1018.01h" on page 414
1018.02h	-	Device code	-	0xD0117	-	Unchangeable	" 1018.02h" on page 414
1018.03h	-	Device revision	-	0x20001	-	Unchangeable	" 1018.03h" on page 415
1400.01h	0x2D14	COB-ID of RPDO1	0 to 4294967295	512	-	Immediately	" 1400.01h" on page 415
1400.02h	0x2D16	Transmission type of RPDO1	0 to 255	255	-	Immediately	" 1400.02h" on page 415
1401.01h	0x2D17	COB-ID of RPDO2	0 to 4294967295	0	-	Immediately	" 1401.01h" on page 416
1401.02h	0x2D19	Transmission type of RPDO2	0 to 255	255	-	Immediately	" 1401.02h" on page 416
1402.01h	0x2D1A	COB-ID of RPDO3	0 to 4294967295	0	-	Immediately	" 1402.01h" on page 416
1402.02h	0x2D1C	Transmission type of RPDO3	0 to 255	255	-	Immediately	" 1402.02h" on page 416
1403.01h	0x2D1D	COB-ID of RPDO4	0 to 4294967295	0	-	Immediately	" 1403.01h" on page 417
1403.02h	0x2D1F	Transmission type of RPDO4	0 to 255	255	-	Immediately	" 1403.02h" on page 417
1600.00h	0x2D20	Number of valid mapped objects in RPDO1	0 to 8	1	-	Immediately	" 1600.00h" on page 417
1600.01h	0x2D21	1st mapped object in RPDO1	0 to 2147483647	1614807056	-	Immediately	" 1600.01h" on page 417

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
1600.02h	0x2D23	2nd mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.02h" on page 418
1600.03h	0x2D25	3rd mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.03h" on page 418
1600.04h	0x2D27	4th mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.04h" on page 418
1600.05h	0x2D29	5th mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.05h" on page 419
1600.06h	0x2D2B	6th mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.06h" on page 419
1600.07h	0x2D2D	7th mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.07h" on page 419
1600.08h	0x2D2F	8th mapped object in RPDO1	0 to 2147483647	0	-	Immediately	" 1600.08h" on page 419
1601.00h	0x2D31	Number of valid mapped objects in RPDO2	0 to 8	2	-	Immediately	" 1601.00h" on page 419
1601.01h	0x2D32	1st mapped object in RPDO2	0 to 2147483647	1614807056	-	Immediately	" 1601.01h" on page 420
1601.02h	0x2D34	2nd mapped object in RPDO2	0 to 2147483647	1616904200	-	Immediately	" 1601.02h" on page 420
1601.03h	0x2D36	3rd mapped object in RPDO2	0 to 2147483647	0	-	Immediately	" 1601.03h" on page 420
1601.04h	0x2D38	4th mapped object in RPDO2	0 to 2147483647	0	-	Immediately	" 1601.04h" on page 421
1601.05h	0x2D3A	5th mapped object in RPDO2	0 to 2147483647	0	-	Immediately	" 1601.05h" on page 421
1601.06h	0x2D3C	6th mapped object in RPDO2	0 to 2147483647	0	-	Immediately	" 1601.06h" on page 421
1601.07h	0x2D3E	7th mapped object in RPDO2	0 to 2147483647	0	-	Immediately	" 1601.07h" on page 421
1601.08h	0x2D40	8th mapped object in RPDO2	0 to 2147483647	0	-	Immediately	" 1601.08h" on page 422
1602.00h	0x2D42	Number of valid mapped objects in RPDO3	0 to 8	2	-	Immediately	" 1602.00h" on page 422
1602.01h	0x2D43	1st mapped object in RPDO3	0 to 2147483647	1614807056	-	Immediately	" 1602.01h" on page 422
1602.02h	0x2D45	2nd mapped object in RPDO3	0 to 2147483647	1618608160	-	Immediately	" 1602.02h" on page 423
1602.03h	0x2D47	3rd mapped object in RPDO3	0 to 2147483647	0	-	Immediately	" 1602.03h" on page 423

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
1602.04h	0x2D49	4th mapped object in RPDO3	0 to 2147483647	0	-	Immediately	"1602.04h" on page 423
1602.05h	0x2D4B	5th mapped object in RPDO3	0 to 2147483647	0	-	Immediately	"1602.05h" on page 423
1602.06h	0x2D4D	6th mapped object in RPDO3	0 to 2147483647	0	-	Immediately	"1602.06h" on page 423
1602.07h	0x2D4F	7th mapped object in RPDO3	0 to 2147483647	0	-	Immediately	"1602.07h" on page 424
1602.08h	0x2D51	8th mapped object in RPDO3	0 to 2147483647	0	-	Immediately	"1602.08h" on page 424
1603.00h	0x2D53	Number of valid mapped objects in RPDO4	0 to 8	2	-	Immediately	"1603.00h" on page 424
1603.01h	0x2D54	1st mapped object in RPDO4	0 to 2147483647	1614807056	-	Immediately	"1603.01h" on page 424
1603.02h	0x2D56	2nd mapped object in RPDO4	0 to 2147483647	1627324448	-	Immediately	"1603.02h" on page 425
1603.03h	0x2D58	3rd mapped object in RPDO4	0 to 2147483647	0	-	Immediately	"1603.03h" on page 425
1603.04h	0x2D5A	4th mapped object in RPDO4	0 to 2147483647	0	-	Immediately	"1603.04h" on page 425
1603.05h	0x2D5C	5th mapped object in RPDO4	0 to 2147483647	0	-	Immediately	"1603.05h" on page 426
1603.06h	0x2D5E	6th mapped object in RPDO4	0 to 2147483647	0	-	Immediately	"1603.06h" on page 426
1603.07h	0x2D60	7th mapped object in RPDO4	0 to 2147483647	0	-	Immediately	"1603.07h" on page 426
1603.08h	0x2D62	8th mapped object in RPDO4	0 to 2147483647	0	-	Immediately	"1603.08h" on page 426
1800.01h	0x2E00	COB-ID of TPDO1	0 to 4294967295	0	-	Immediately	"1800.01h" on page 427
1800.02h	0x2E02	Transmission type of TPDO1	0 to 255	255	-	Immediately	"1800.02h" on page 427
1800.03h	0x2E03	Inhibit time of TPDO1	0 us to 65535 us	500	100us	Immediately	"1800.03h" on page 427
1800.05h	0x2E04	Event counter of TPDO1	0 ms to 65535 ms	0	ms	Immediately	"1800.05h" on page 428
1801.01h	0x2E05	COB-ID of TPDO2	0 to 4294967295	0	-	Immediately	"1801.01h" on page 428
1801.02h	0x2E07	Transmission type of TPDO2	0 to 255	255	-	Immediately	"1801.02h" on page 428
1801.03h	0x2E08	Inhibit time of TPDO2	0 us to 65535 us	500	100us	Immediately	"1801.03h" on page 428

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
1801.05h	0x2E09	Event counter of TPDO2	0 ms to 65535 ms	0	ms	Immediately	" 1801.05h" on page 429
1802.01h	0x2E0A	COB-ID of TPDO3	0 to 4294967295	0	-	Immediately	" 1802.01h" on page 429
1802.02h	0x2E0C	Transmission type of TPDO3	0 to 255	255	-	Immediately	" 1802.02h" on page 429
1802.03h	0x2E0D	Inhibit time of TPDO3	0 us to 65535 us	500	100us	Immediately	" 1802.03h" on page 429
1802.05h	0x2E0E	Event counter of TPDO3	0 ms to 65535 ms	0	ms	Immediately	" 1802.05h" on page 430
1803.01h	0x2E0F	COB-ID of TPDO4	0 to 4294967295	0	-	Immediately	" 1803.01h" on page 430
1803.02h	0x2E11	Transmission type of TPDO4	0 to 255	255	-	Immediately	" 1803.02h" on page 430
1803.03h	0x2E12	Inhibit time of TPDO4	0 us to 65535 us	500	100us	Immediately	" 1803.03h" on page 430
1803.05h	0x2E13	Event counter of TPDO4	0 ms to 65535 ms	0	ms	Immediately	" 1803.05h" on page 431
1A00.00h	0x2E14	Number of valid mapped objects in TPDO1	0 to 8	1	-	Immediately	" 1A00.00h" on page 431
1A00.01h	0x2E15	1st mapped object in TPDO1	0 to 2147483647	1614872592	-	Immediately	" 1A00.01h" on page 431
1A00.02h	0x2E17	2nd mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.02h" on page 432
1A00.03h	0x2E19	3rd mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.03h" on page 432
1A00.04h	0x2E1B	4th mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.04h" on page 432
1A00.05h	0x2E1D	5th mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.05h" on page 432
1A00.06h	0x2E1F	6th mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.06h" on page 432
1A00.07h	0x2E21	7th mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.07h" on page 433
1A00.08h	0x2E23	8th mapped object in TPDO1	0 to 2147483647	0	-	Immediately	" 1A00.08h" on page 433
1A01.00h	0x2E25	Number of valid mapped objects in TPDO2	0 to 8	2	-	Immediately	" 1A01.00h" on page 433
1A01.01h	0x2E26	1st mapped object in TPDO2	0 to 2147483647	1614872592	-	Immediately	" 1A01.01h" on page 433

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
1A01.02h	0x2E28	2nd mapped object in TPDO2	0 to 2147483647	1616969736	-	Immediately	" 1A01.02h" on page 434
1A01.03h	0x2E2A	3rd mapped object in TPDO2	0 to 2147483647	0	-	Immediately	" 1A01.03h" on page 434
1A01.04h	0x2E2C	4th mapped object in TPDO2	0 to 2147483647	0	-	Immediately	" 1A01.04h" on page 434
1A01.05h	0x2E2E	5th mapped object in TPDO2	0 to 2147483647	0	-	Immediately	" 1A01.05h" on page 435
1A01.06h	0x2E30	6th mapped object in TPDO2	0 to 2147483647	0	-	Immediately	" 1A01.06h" on page 435
1A01.07h	0x2E32	7th mapped object in TPDO2	0 to 2147483647	0	-	Immediately	" 1A01.07h" on page 435
1A01.08h	0x2E34	8th mapped object in TPDO2	0 to 2147483647	0	-	Immediately	" 1A01.08h" on page 435
1A02.00h	0x2E36	Number of valid mapped objects in TPDO3	0 to 8	2	-	Immediately	" 1A02.00h" on page 436
1A02.01h	0x2E37	1st mapped object in TPDO3	0 to 2147483647	1614872592	-	Immediately	" 1A02.01h" on page 436
1A02.02h	0x2E39	2nd mapped object in TPDO3	0 to 2147483647	1617166368	-	Immediately	" 1A02.02h" on page 436
1A02.03h	0x2E3B	3rd mapped object in TPDO3	0 to 2147483647	0	-	Immediately	" 1A02.03h" on page 437
1A02.04h	0x2E3D	4th mapped object in TPDO3	0 to 2147483647	0	-	Immediately	" 1A02.04h" on page 437
1A02.05h	0x2E3F	5th mapped object in TPDO3	0 to 2147483647	0	-	Immediately	" 1A02.05h" on page 437
1A02.06h	0x2E41	6th mapped object in TPDO3	0 to 2147483647	0	-	Immediately	" 1A02.06h" on page 437
1A02.07h	0x2E43	7th mapped object in TPDO3	0 to 2147483647	0	-	Immediately	" 1A02.07h" on page 437
1A02.08h	0x2E45	8th mapped object in TPDO3	0 to 2147483647	0	-	Immediately	" 1A02.08h" on page 438
1A03.00h	0x2E47	Number of valid mapped objects in TPDO4	0 to 8	2	-	Immediately	" 1A03.00h" on page 438
1A03.01h	0x2E48	1st mapped object in TPDO4	0 to 2147483647	1614872592	-	Immediately	" 1A03.01h" on page 438
1A03.02h	0x2E4A	2nd mapped object in TPDO4	0 to 2147483647	1617690656	-	Immediately	" 1A03.02h" on page 439
1A03.03h	0x2E4C	3rd mapped object in TPDO4	0 to 2147483647	0	-	Immediately	" 1A03.03h" on page 439

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
1A03.04h	0x2E4E	4th mapped object in TPDO4	0 to 2147483647	0	-	Immediately	" 1A03.04h" on page 439
1A03.05h	0x2E50	5th mapped object in TPDO4	0 to 2147483647	0	-	Immediately	" 1A03.05h" on page 439
1A03.06h	0x2E52	6th mapped object in TPDO4	0 to 2147483647	0	-	Immediately	" 1A03.06h" on page 440
1A03.07h	0x2E54	7th mapped object in TPDO4	0 to 2147483647	0	-	Immediately	" 1A03.07h" on page 440
1A03.08h	0x2E56	8th mapped object in TPDO4	0 to 2147483647	0	-	Immediately	" 1A03.08h" on page 440

5.27 Parameter Group 6000h

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
603Fh	0x3500	Error Code	0 to 65535	0	-	Unchangeable	" 603Fh" on page 440
6040h	0x3502	Control word	0 to 65535	0	-	Immediately	" 6040h" on page 441
6041h	0x3504	Status word	0 to 65535	0	-	Unchangeable	" 6041h" on page 441
605Ah	0x3536	Quick stop option code	0: Coast to stop, keeping de-energized state 1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state 2: Ramp to stop as defined by 6085h, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state 6: Ramp to stop as defined by 6085h, keeping position lock state 7: Stop at emergency stop torque, keeping position lock state	2	-	At stop	" 605Ah" on page 441

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
605Ch	0x353A	Stop mode at S-ON OFF	–4: Ramp to stop as defined by 6085h, keeping dynamic braking state –3: Stop at zero speed, keeping dynamic braking state –2: Ramp to stop as defined by 6084h/ 609Ah, keeping dynamic braking state –1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Ramp to stop as defined by 6084h/ 609Ah, keeping de-energized state 2: Dynamic braking stop, keeping de-energized state	0	-	At stop	*" 605Ch" on page 442*
605Dh	0x353C	Stop option code	1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state 2: Ramp to stop as defined by 6085h, keeping position lock state 3: Stop at emergency stop torque, keeping position lock state	1	-	At stop	*" 605Dh" on page 443*

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
605Eh	0x353E	Stop mode at No.2 fault	–5: Stop at zero speed, keeping dynamic braking state –4: Stop at emergency stop torque, keeping dynamic braking state –3: Ramp to stop as defined by 6085h, keeping dynamic braking state –2: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping dynamic braking state –1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping de-energized state 2: Ramp to stop as defined by 6085h, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 4: Dynamic braking stop, keeping de-energized state	2	-	At stop	*" 605Eh" on page 443*
6060h	0x3542	Modes of operation	1: Profile position (PP) mode 3: Profile velocity (PV) mode 4: Profile torque (PT) mode 6: Homing (HM) mode 7: Interpolation (IP) mode	0	-	Immediately	*" 6060h" on page 444*
6061h	0x3544	Operation mode display	1: Profile position (PP) mode 3: Profile velocity (PV) mode 4: Profile torque (PT) mode 6: Homing (HM) mode 7: Interpolation (IP) mode	0	-	Unchangeable	*" 6061h" on page 444*
6062h	0x3546	Position reference	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 6062h" on page 445*
6063h	0x3548	Position actual value	–2147483648 to +2147483647	0	Pulse	Unchangeable	*" 6063h" on page 445*
6064h	0x354A	Position actual value	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 6064h" on page 445*
6065h	0x354C	Following error window	0 to 4294967295	27486951	Reference unit	Immediately	*" 6065h" on page 446*

Param. No.	Communi cation Address	Name	Setpoint	Default	Unit	Change Method	Page
6066h	0x354E	Following error time out	0 ms to 65535 ms	0	ms	Immedi ately	" 6066h" on page 446
6067h	0x3550	Position window	0 to 4294967295	5872	Refer ence unit	Immedi ately	" 6067h" on page 446
6068h	0x3552	Position window time	0 ms to 65535 ms	0	ms	Immedi ately	" 6068h" on page 447
606Ch	0x355A	Actual speed	–2147483648 to +2147483647	0	Refer ence unit/s	Unchange able	" 606Ch" on page 447
606Dh	0x355C	Velocity window	0 to 65535	10	rpm	Immedi ately	" 606Dh" on page 447
606Eh	0x355E	Velocity window time	0 ms to 65535 ms	0	ms	Immedi ately	" 606Eh" on page 448
606Fh	0x3560	Velocity threshold	0 to 65535	10	rpm	Immedi ately	" 606Fh" on page 448
6070h	0x3562	Velocity threshold time	0 ms to 65535 ms	0	ms	Immedi ately	" 6070h" on page 449
6071h	0x3564	Target torque	-40000 to 40000	0	0.001	Immedi ately	" 6071h" on page 449
6072h	0x3566	Max. torque	0 to 40000	3500	0.001	Immedi ately	" 6072h" on page 450
6074h	0x356A	Torque reference	-40000 to 40000	0	0.001	Unchange able	" 6074h" on page 450
6077h	0x3570	Torque actual value	-40000 to 40000	0	0.001	Unchange able	" 6077h" on page 450
607Ah	0x3576	Target position	-2147483648 to 2147483647	0	Refer ence unit	Immedi ately	" 607Ah" on page 450
607Ch	0x357A	Home offset	-2147483648 to 2147483647	0	Refer ence unit	Immedi ately	" 607Ch" on page 451
607D.01h	0x3700	Min. position limit	-2147483648 to 2147483647	-214748364 8	Refer ence unit	Immedi ately	" 607D.01h" on page 451
607D.02h	0x3800	Max. position limit	-2147483648 to 2147483647	214748364 7	Refer ence unit	Immedi ately	" 607D.02h" on page 452
607Eh	0x357E	Reference polarity	0 to 128	0	-	Immedi ately	" 607Eh" on page 452
607Fh	0x3580	Max. profile velocity	0 to 4294967295	838860800	Refer ence unit/s	Immedi ately	" 607Fh" on page 452

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
6081h	0x3584	Profile velocity	0 to 4294967295	13981013	Reference unit/s	Immediately	" 6081h" on page 453
6083h	0x3588	Profile acceleration	0 reference unit/s^2 to 4294967295 reference units/s^2	1398101333	Reference unit/s^2	Immediately	" 6083h" on page 453
6084h	0x358A	Profile deceleration	0 reference unit/s^2 to 4294967295 reference units/s^2	1398101333	Reference unit/s^2	Immediately	" 6084h" on page 453
6085h	0x358C	Quick stop deceleration	0 reference unit/s^2 to 4294967295 reference units/s^2	2147483647	Reference unit/s^2	Immediately	" 6085h" on page 454
6087h	0x3590	Torque slope	0%/S to 4294967295%/s	4294967295	0.1%/s	Immediately	" 6087h" on page 454
6091.01h	0x3714	Motor revolutions	1 to 4294967295	1	-	At stop	" 6091.01h" on page 454
6091.02h	0x3814	Shaft revolutions	1 to 4294967295	1	-	At stop	" 6091.02h" on page 455
6098h	0x35B2	Homing method	-3 to 35	1	-	Immediately	" 6098h" on page 455
6099.01h	0x371C	Speed during search for switch	0 to 4294967295	13981013	Reference unit/s	At stop	" 6099.01h" on page 457
6099.02h	0x381C	Speed during search for zero	0 to 4294967295	1398101	Reference unit/s	At stop	" 6099.02h" on page 457
609Ah	0x35B6	Homing acceleration	0 reference unit/s^2 to 4294967295 reference units/s^2	1398101333	Reference unit/s^2	Immediately	" 609Ah" on page 457
60B8h	0x35F2	Touch probe function	0 to 65535	0	-	Immediately	" 60B8h" on page 458
60B9h	0x35F4	Touch probe status	0 to 65535	0	-	Unchangeable	" 60B9h" on page 458
60BAh	0x35F6	Touch probe 1 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 60BAh" on page 458
60BBh	0x35F8	Touch probe 1 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 60BBh" on page 459
60BCh	0x35FA	Touch probe 2 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 60BCh" on page 459
60BDh	0x35FC	Touch probe 2 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 60BDh" on page 459

Param. No.	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
60C1.01h	0x3744	Interpolation displacement	-2147483648 to 2147483647	0	Reference unit	Immediately	" 60C1.01h" on page 459
60C2.01h	0x3745	Interpolation time period	1 to 20	1	-	Immediately	" 60C2.01h" on page 460
60C2.02h	0x3845	Interpolation time units	0 to 253	253	-	Immediately	" 60C2.02h" on page 460
60C5h	0x360C	Max. acceleration	0 reference unit/s^2 to 4294967295 reference units/s^2	4294967295	Reference unit/s^2	Immediately	" 60C5h" on page 460
60C6h	0x360E	Max. deceleration	0 reference unit/s^2 to 4294967295 reference units/s^2	4294967295	Reference unit/s^2	Immediately	" 60C6h" on page 461
60D5h	0x362C	Touch probe 1 positive edge counter	0 to 65535	0	-	Unchangeable	" 60D5h" on page 461
60D6h	0x362E	Touch probe 1 negative edge counter	0 to 65535	0	-	Unchangeable	" 60D6h" on page 461
60D7h	0x3630	Touch probe 2 positive edge counter	0 to 65535	0	-	Unchangeable	" 60D7h" on page 461
60D8h	0x3632	Touch probe 2 negative edge counter	0 to 65535	0	-	Unchangeable	" 60D8h" on page 462
60E0h	0x3642	Positive torque limit value	0 to 40000	3500	0.001	Immediately	" 60E0h" on page 462
60E1h	0x3644	Negative torque limit value	0 to 40000	3500	0.001	Immediately	" 60E1h" on page 462
60F4h	0x366A	Position deviation	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 60F4h" on page 462
60FCh	0x367A	Position reference	–2147483648 to +2147483647	0	Pulse	Unchangeable	" 60FCh" on page 463
60FDh	0x367C	DI state	0 to 4294967295	0	-	Unchangeable	" 60FDh" on page 463
60FFh	0x3680	Target velocity	–2147483648 to +2147483647	0	Reference unit/s	Immediately	" 60FFh" on page 464
60FE.01h	0x3781	Physical outputs	0 to 4294967295	0	-	Immediately	" 60FE.01h" on page 464
60FE.02h	0x3881	Bitmask	0 to 4294967295	0	-	Immediately	" 60FE.02h" on page 465

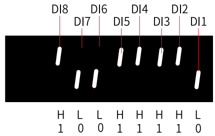
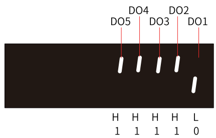
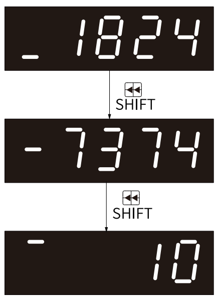
6 Appendix

6.1 Display of Monitoring Parameters

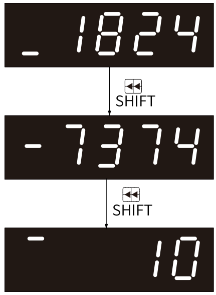
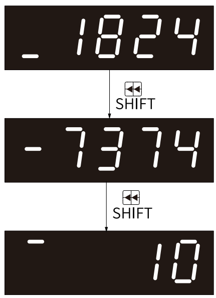
- Group H0B: Displays parameters used to monitor the operating state of the servo drive.
- Set H02.32 (Default keypad display) properly. After the motor operates normally, the keypad switches from status display to parameter display. The parameter group number is H0b and the offset within the group is the setpoint of H02.32.
- For example, if H02.32 is set to 00 and the motor speed is not 0 rpm, the keypad displays the value of H0b.00.

The following table describes the monitoring parameters in group H0b.

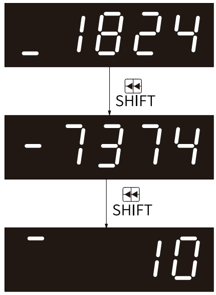
Param. No.	Name	Unit	Meaning	Example of Display
H0b.00	Motor speed actual value	rpm	Displays the actual value of the motor speed after round-off, which can be accurate to 1rpm.	3000 rpm:  -3000 rpm: 
H0b.01	Speed reference	rpm	Displays the present speed reference of the servo drive.	3000 rpm:  -3000 rpm: 
H0b.02	Internal torque reference	0.10%	Displays the ratio of actual torque output of the motor to the rated torque of the motor.	Display of 100.0%:  Display of -100.0%: 

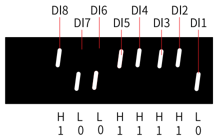
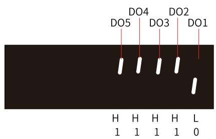
Param. No.	Name	Unit	Meaning	Example of Display
H0b.03	Monitored DI status	-	Displays the optocoupler status of DI1 to DI8: Upper LED segments turned on: The optocoupler is switched off (indicated by "1"). Lower LED segments turned on: The optocoupler is switched on (indicated by "0"). The value of H0b.03 read in the software tool is a decimal.	For example, if DI1 is low level and DI2 to DI8 are high level, the corresponding binary value is "10011110", and the value of H0b.03 read in the software tool is 158. The keypad displays as follows: 
H0b.05	Monitored DO status	-	Displays the optocoupler status of DO1 to DO5: Upper LED segments turned on: The optocoupler is switched off (indicated by "1"). Lower LED segments turned on: The optocoupler is switched on (indicated by "0"). The value of H0b.05 read in the software tool is a decimal.	For example, if DO1 is low level and DO2 to DO5 are high level, then, the binary value is "11110", and the value of H0b.05 read in the software tool is 30. The keypad displays as follows: 
H0b.07	Absolute position counter (32-bit decimal)	Reference unit	Displays current absolute position of the motor (reference unit).	Display of 1073741824 in reference unit: 

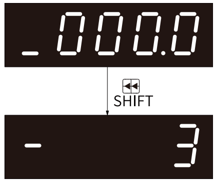
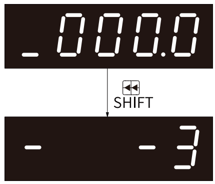
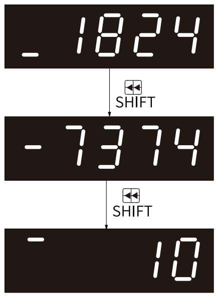
Param. No.	Name	Unit	Meaning	Example of Display
H0b.09	Mechanical angle (pulses starting from the home)	p	Indicates the current mechanical angle (p) of the motor. The value 0 indicates that the mechanical angle is 0°. Maximum value of H0b.09 for an incremental encoder: Number of encoder pulses per revolution x 4 - 1. For example, the maximum value of H0b.09 for a 2500-PPR incremental encoder is 9999. Maximum value of H0b.09 for an absolute encoder is 65535. The actual mechanical angle is calculated using the following formula: $\text{Actual mechanical angle} = \frac{\text{H0b.09}}{\text{H0b.09 max. value} + 1} \times 360.0°$	Display of 10000 p: 
H0b.10	Rotation angle (electrical angle)	0.1°	Displays current electrical angle of the motor.	Display of 360.0°: 
H0b.11	Speed correspond ing to the input position reference	rpm	Displays the speed corresponding to the position reference per control cycle of the servo drive.	3000 rpm:  -3000 rpm: 
H0b.12	Average load rate	0.10%	Displays the ratio of the average load torque to the rated torque of the motor.	Display of 100.0%: 

Param. No.	Name	Unit	Meaning	Example of Display
H0b.13	Input position reference counter (32-bit decimal)	Reference unit	Counts and displays the number of input position references.	Display of 1073741824 in reference unit: 
H0b.15	Encoder position deviation counter (32-bit decimal)	Encoder unit	Encoder position deviation = Sum of input position references (encoder unit) – Sum of pulses fed back by the encoder (encoder unit)	Display of 10000 in encoder unit: 
H0b.17	Feedback pulse counter (32-bit decimal)	Encoder unit	Counts and displays the number of pulses fed back by the encoder (encoder unit).	Display of 1073741824 in encoder unit: 
H0b.19	Total power-on time (32-bit decimal)	0.1s	Counts and displays the total power-on time of the servo drive.	Display of 429496729.5s: 

Param. No.	Name	Unit	Meaning	Example of Display
H0b.24	RMS value of phase current	0.01 A	Displays the RMS value of the phase current of the servo motor.	Display of 4.60 A: 
H0b.26	Bus voltage	0.1 V	Displays the DC bus voltage of the main circuit.	Display of 311.0 V rectified from 220 VAC:  Display of 537.0 V rectified from 380 VAC: 
H0b.27	Module temperature	°C	Displays the temperature of the power module inside the servo drive.	Display of 27°C: 
H0b.33	Fault log	-	Used to select the previous fault to be viewed. 0: Present fault 1: Last fault 2: 2nd to last fault ... 20: 20th to last fault	0: Display of present fault: 
H0b.34	Fault code of the selected fault	-	Displays the code of the fault selected in H0b.33. When no fault occurs, the value of H0b.34 is 0.	If H0b.33 is 0, and H0b.34 is E941.0, the current fault code is 941.0. Corresponding display: 

Param. No.	Name	Unit	Meaning	Example of Display
H0b.35	Time stamp upon occurrence of the selected fault	s	Displays the total operating time of the servo drive when the fault displayed in H0b.34 occurred. When no fault occurs, the value of H0b.35 is 0.	If H0b.34 is E941.0 and H0b.35 is 1073741824, the current fault code is 941 and the total operating time of the servo drive is 1073741824s when the fault occurs. 
H0b.37	Motor speed upon occurrence of the selected fault	rpm	Displays the speed of the servo motor when the fault displayed in H0b.34 occurred. When no fault occurs, the value of H0b.37 is 0.	3000 rpm:  -3000 rpm: 
H0b.38	Motor phase U current upon occurrence of the selected fault	0.01 A	Displays the RMS value of motor phase U winding current when the fault displayed in H0b.34 occurred. When no fault occurs, the value of H0b.38 is 0.	Display of 4.60 A: 
H0b.39	Motor phase V current upon occurrence of the selected fault	0.01 A	Displays the RMS value of motor phase V winding current when the fault displayed in H0b.34 occurred. When no fault occurs, the value of H0b.39 is 0.	Display of 4.60 A: 

Param. No.	Name	Unit	Meaning	Example of Display
H0b.40	Bus voltage upon occurrence of the selected fault	V	Displays the DC bus voltage of the main circuit when the fault displayed in H0b.34 occurred. When no fault occurs, the value of H0b.40 is 0.	Display of 311.0 V rectified from 220 VAC:  Display of 537.0 V rectified from 380 VAC: 
H0b.41	DI status upon occurrence of the selected fault	-	Displays the high/low level status of DI1 to DI8 when the fault displayed in H0b.34 occurred. The method for determining the DI level status is the same as that of H0b.03. When no fault occurs, all DIs are displayed as low level in H0b.41 (indicated by the decimal value 0).	Display of H0b.41 = 158: 
H0b.42	DO status upon occurrence of the selected fault	-	Displays the high/low level status of DO1 to DO5 when the fault displayed in H0b.34 occurred. The method for determining the DO level status is the same as that of H0b.05. When no fault occurs, all DOs are displayed as low level in H0b.42 (indicated by the decimal value 0).	Display of H0b.42 = 15: 

Param. No.	Name	Unit	Meaning	Example of Display
H0b.53	Position deviation counter (32-bit decimal)	Reference unit	Position deviation = Sum of input position references (reference unit) - Sum of pulses fed back by the encoder (reference unit)	Display of 10000 in reference unit: 
H0b.55	Motor speed actual value	0.1 rpm	Displays the actual value of the motor speed, which can be accurate to 0.1 RPM.	Display of 3000.0rpm:  Display of –3000.0 RPM: 
H0b.64	Real-time input position reference counter	Reference unit	Displays the value of the position reference counter before being divided or multiplied by the electronic gear ratio. This value is independent of the servo drive status and the control mode.	Display of 1073741824 in reference unit: 

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