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SV660ND Series Servo Drive

Function Guide

Industrial Automation | Intelligent Elevator | New Energy Vehicle | Industrial Robot | Rail Transit

Data code PS00005890A02

Preface

Introduction

Thank you for purchasing the SV660ND series servo drive developed by Inovance.

The SV660ND AC servo drive is a high performance multi-drive product. It comes with a capacity of 0.4 kW and 0.75 kW, as well as support for EtherCAT bus communication. It features STO (SIL3) one-key tuning and adaptive notch filters, which allow for easy use of the product. It offers quiet and stable operation and accurate position control by working with an MS1 series high-response servo motor with a 23-bit-turn absolute encoder.

Its high integration, bus support, small size, easy commissioning, and environment robustness make it a perfect match for equipment of cell phone manufacture, robots, machine tool, lithium battery, silicon semiconductor, touchscreen and LED.

This guide presents product functions and parameters, including function overview, basic servo functions, adjustment and parameter list.

- The drawings in the user guide are shown for illustration only and may be different from the product. Actual products may vary.
- The instructions are subject to changes due to product upgrade, specification modifications, and efforts to increase the accuracy and convenience of the user guide.

More information

Data name	Data code	Description
SV660ND Series Servo Drive Selection Guide	PS00005789	Provides instructions on product selection, including the list of supporting components, technical data on the drive and motor, and the selection guide of cables.
SV660ND Series Servo Drive installation Guide	PS00005790	Provides instructions on product installation, including installation steps, mechanical installation, and electrical installation.
SV660ND Series Servo Drive Hardware Guide	PS00005125	Provides electrical design guidance of the equipment, description of terminals, required certificates and standards, and solutions to common EMC problems.
SV660ND Series Servo Drive Commissioning Guide	PS00006000	Describes the parameters, troubleshooting, operating panel, commissioning software, and commissioning flow and steps.

Data name	Data code	Description
SV660ND Series Servo Drive Communication Guide	PS00006002	Introduces the functions and parameters of the servo drive, including EtherCAT communication configuration, parameter description, and communication application cases.
SV660ND Series Servo Drive Troubleshooting Guide	PS00006001	Introduces faults and fault levels, the troubleshooting process, warning codes, and fault codes.
SV660ND Series Servo Drive Maintenance Guide	PS00005791	Provides instructions on maintenance and repair of the equipment.
SV660ND Series Servo Drive Safety Guide	PS00005950	Introduces the safety function and related certifications and standards, wiring, commissioning process, troubleshooting, and functions.
SV660ND Series Servo Drive Manual Package	PS00005852	Describes model selection, installation, wiring, commissioning, functions, troubleshooting, and parameters.
SV660ND Series Servo Drive Function Guide	PS00005890	Introduces product functions and parameters, including function overview, basic servo functions, adjustment and parameter descriptions.

Revision history

Date	Version	Description
December 2024	A02	• Made minor corrections. • Added descriptions of parameters H0A.71 and H0C.71. • Updated the descriptions of 60FE.01h and 60FE.02h. • Updated the descriptions of 6040h and 6041h.
2024-03	A01	• Updated the LVD safety standard in the Safety Standards and Specifications section. • Updated the Suzhou address and added the My Inovance QR code on the cover page.
2022-06	A00	First issue.

Access to the guide

This guide is not delivered with the product. You can obtain the PDF version by the following methods:

- Perform keyword searching under Service and Support at http://www.inovance.com.
- Scan the QR code on the equipment to acquire more information.

- Scan the QR code below to install the My Inovance app, where you can search for and download user guides.



Warranty disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is caused by proper operation of the user. Maintenance fees will be charged after the warranty expires.

Within the warranty period, maintenance fees will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or unusual voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance fee is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

For detailed warranty descriptions, see the Product Warranty Card.

Table of Contents

Preface 1
Fundamental Safety Instructions 8
1 Function Overview 15
2 Basic Functions of the Servo Drive 17
2.1 Conversion Factor 18
2.2 Servo States 19
2.3 Operation Modes 22
2.4 Cyclic Synchronous Position (CSP) Mode 22
2.4.1 Function Block Diagram 23
2.4.2 Configuration Block Diagram 23
2.4.3 Recommended Configuration 23
2.4.4 Related Parameters 24
2.4.5 Related Function Settings 26
2.5 Cyclic Synchronous Torque Mode (CST) 26
2.5.1 Function Block Diagram 26
2.5.2 Configuration Block Diagram 27
2.5.3 Recommended Configuration 27
2.5.4 Related Parameters 27
2.5.5 Related Function Settings 29
2.6 Cyclic Synchronous Velocity Mode (CSV) 30
2.6.1 Function Block Diagram 31
2.6.2 Configuration Block Diagram 31
2.6.3 Recommended Configuration 31
2.6.4 Related Parameters 31
2.6.5 Related Function Settings 33
2.7 Profile Position (PP) Mode 33
2.7.1 Function Block Diagram 34
2.7.2 Configuration Block Diagram 34
2.7.3 Recommended Configuration 37
2.7.4 Related Parameters 37
2.7.5 Related Function Settings 40
2.8 Profile Torque (PT) Mode 41
2.8.1 Function Block Diagram 42
2.8.2 Configuration Block Diagram 42
2.8.3 Recommended Configuration 42
2.8.4 Related Parameters 43
2.8.5 Related Function Settings 45
2.9 Profile Velocity (PV) Mode 47

2.9.1 Function Block Diagram 47
2.9.2 Configuration Block Diagram 48
2.9.3 Recommended Configuration 48
2.9.4 Related Parameters 48
2.9.5 Related Function Settings 50
2.10 Homing Mode (HM) 51
2.10.1 Function Block Diagram 52
2.10.2 Configuration Block Diagram 52
2.10.3 Recommended Configuration 53
2.10.4 Related Parameters 53
2.10.5 Related Function Settings 55
2.10.6 Homing Operation 56
3 Applicable Scenarios 82
3.1 Absolute System 82
3.1.1 Overview 82
3.1.2 Related Parameters 82
3.1.3 Precautions 86
3.2 Software position limit 87
3.3 Position Comparison 88
3.4 Black Box 97
3.5 Touch Probe 102
3.6 EtherCAT-forced DO 105
4 STO Safety Function 108
4.1 Safety Overview 108
4.1.1 Terms and Abbreviations 108
4.1.2 Safety Standards and Specifications 108
4.1.3 Precautions 111
4.2 STO 115
4.2.1 Overview 115
4.2.2 Function Use and Monitoring 116
4.2.3 Fault reset 119
4.2.4 Safety Function Response Time 120
4.3 Acceptance 121
5 Description of Parameters 124
5.1 H00 Servo Motor Parameters 124
5.2 H01 Drive Parameters 136
5.3 H02 Basic Control Parameters 151
5.4 H03 Terminal Input Parameters 162
5.5 H04 Terminal Output Parameters 173

5.6 H05 Position Control Parameters 179
5.7 H06 Speed Control Parameters. 185
5.8 H07 Torque Control Parameters 195
5.9 H08 Gain Parameters. 202
5.10 H09 Auto-tuning Parameters 221
5.11 H0A Fault and Protection Parameters 235
5.12 H0b Monitoring Parameters 252
5.13 H0C Fault and Protection Parameters 2 268
5.14 H0d Auxiliary Function Parameters 269
5.15 H0E Communication Function Parameters 273
5.16 H18 Position Comparison Output. 282
5.17 H19 Target Position Parameters. 286
5.18 H1F Software Tool Parameters 326
5.19 H30 Related Variables Read through Communication. 328
5.20 H31 References Set Through Communication 329
5.21 1000h Object Dictionary 330
5.22 6000h Object Dictionary 347
6 List of Parameters 375
6.1 List of H00 Servo Motor Parameters 375
6.2 List of H01 Drive Parameters 377
6.3 List of H02 Basic Control Parameters. 381
6.4 List of H03 Terminal Input Parameters 386
6.5 List of H04 Terminal Output Parameters 390
6.6 List of H05 Position Control Parameters 392
6.7 List of H06 Speed Control Parameters 394
6.8 List of H07 Torque Control Parameters 397
6.9 List of H08 Gain Parameters 399
6.10 List of H09 Auto-adjust Parameters 405
6.11 List of H0A Fault and Protection Parameters 409
6.12 List of H0b Monitoring Parameters 414
6.13 Parameter Group H0C 419
6.14 List of H0d Auxiliary Function Parameters. 420
6.15 List of H0E Communication Function Parameters 421
6.16 List of H18 Position Comparison Output Parameters 424
6.17 List of H19 Target Position Parameters 425

6.18 List of H1F Software Tool Parameters 464
6.19 List of H30 Communication Read Parameters 465
6.20 List of H31 Communication Set Parameters 466
6.21 List of 1000h Object Dictionary 466
6.22 List of 6000h Object Dictionary 469
6.22.1 List of 6000h Object Dictionary 469
7 Appendix 475
7.1 Display of Monitoring Parameters 475
7.2 DIDO Function Assignment 483

Fundamental Safety Instructions

Safety Disclaimer

- This chapter provides essential safety instructions for proper use of the equipment. Before operating the equipment, read through the guide and comprehend all the safety instructions. Failure to observe the safety instructions may result in death, personal injuries, or equipment damage.
- "Danger", "Warning", and "Caution" items in this guide do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
- Use this product according to designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injury or property damage caused by improper use.

Safety Levels and Definitions



"DANGER" indicates that failure to comply with the notice can 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.

Safety Precautions

- Drawings in the guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified, and then perform operations in accordance with the user guide.
- Product illustrations in this guide are for reference only. Refer to the actual product for specific information.

Unpacking
 • 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.



- Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking.
- Unpack the package in sequence. Do not hit the package violently.
- Check whether there is damage, rust, or signs of bumping 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



- 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 that 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.
- Do not stand or stay below the equipment when it is being hoisted.
- 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.



- 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 strictly based on the requirements. Failure to comply may result in equipment damage.
- Do not store or transport the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Do not store the equipment for more than three months. If the storage duration exceeds this limit, enhance protective measures and conduct necessary inspections.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Do not transport the equipment with other devices or materials that may harm or have negative impacts on the equipment.

Installation



- Installation must be carried out by skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise. Non-professionals are not allowed to install the equipment.



- Read through the guide and safety instructions before installation.
- Do not install the 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 can result in mechanical hazards.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in electric shock.
- When installing the equipment in an enclosed 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 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 a terminal device, an protective enclosure against file, electrical disturbance, and mechanical damage 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 on an incombustible object such as metal and do not touch or attach the equipment to combustibles. Failure to comply can result in fire.



- 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 top of the equipment. Failure to comply can block ventilation holes, resulting in over-temperature caused by poor ventilation.
- Resonance may occur when the equipment operating at a constant speed switches to 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



- Equipment installation, wiring, maintenance, inspection, or component replacement must be performed only by professionals.
- Before wiring, disconnect all the power supplies of the equipment. Wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. Measure the DC voltage of the main circuit and ensure that the voltage is within the safety range. Failure to comply can result in electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power on. Failure to comply can result in electric shock.
- Ensure the equipment is grounded properly. Failure to comply can result in electric shock.



- Do not connect the input power supply to the output end of the equipment. Failure to comply can result in equipment damage or even 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.
- Tighten the terminal screws with the tightening torque specified in the guide. Failure to comply may result in overheat, damage to the connection parts, or fire.
- After wiring, 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 electric shock or equipment damage.



- Follow the electrostatic discharge (ESD) procedure and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or to the internal circuit.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding. Failure to comply can result in equipment malfunction.

Power-on



- Before powering on, check that the equipment is installed properly with secure wiring and the motor can be restarted.
- Check that the power supply meets equipment requirements before powering on to prevent equipment damage or fire.
- When the equipment is powered on, do not open the cabinet door or protective cover, touch any wiring terminal, or remove any component of the equipment. Failure to comply can result in electric shock.



- After wiring and parameter setting, perform a trial run to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage.
- Before powering on, check that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may result in fire.
- Before powering 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 can result in personal injuries or even death.
- During operation, do not touch any connecting terminals or disassemble any component of the equipment. Failure to comply can result in electric shock.

WARNING

- Do not touch the equipment enclosure, fan, or resistor with bare hands. Failure to comply may result in burns.
- During operation, prevent metal or other objects from falling into the equipment. Failure to comply may result in fire or equipment damage.

Maintenance

DANGER

- Equipment installation, wiring, maintenance, inspection, or component replacement must be performed only by professionals.
- Do not maintain the equipment with power on. Failure to comply can result in electric shock.
- Before maintenance, disconnect all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.
- When a permanent magnet motor is used, do not touch the motor terminals immediately after power-off because the motor terminals can generate induced voltage during rotation even after the equipment is powered off. Failure to comply can result in electric shock.

WARNING

- Perform routine and periodic inspection and maintenance on the equipment in accordance with maintenance requirements and keep a record.

Repair

DANGER

- Equipment installation, wiring, maintenance, inspection, or component replacement must be performed only by professionals.
- Do not maintain the equipment with power on. Failure to comply can result in 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.



- Require for repair services in accordance with the product 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.
- Troubleshooting and repair must be performed by professionals according to the repair instructions, with repair records kept properly.
- Replace quick-wear parts of the equipment in accordance with the replacement instructions.
- Do not operate on damaged equipment. Failure to comply may result in death, personal injuries, or equipment damage.
- After the equipment is replaced, check the wiring and set parameters again.

Disposal



- 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

Precautions for dynamic brake

- Dynamic braking can only be used for emergency shutdown in case of equipment faults and sudden power failure. Do not trigger faults or power failure frequently.
- When the equipment is operating at high speed, ensure an interval of more than five minutes for the dynamic braking function. Failure to comply may result in damage to the internal dynamic braking circuit.
- Dynamic braking is common in rotary mechanical structures. When a motor is stopped by dynamic braking, the inertia of the load keeps making it rotate. This generates a short-circuit current that flows through the dynamic brake. If this situation continues, the drive, and even the motor, may be burned.

Precautions for grounding

When applications such as electric welders are involved, connect the PE cable of the motor to the screws of the die-cast structural component of the drive. Failure to comply may result in motor burnout.

Effects of electromagnetic fields on medical implants

- The motor is hazardous to persons wearing medical implants nearby the equipment.
- The electromagnetic field affects the function of medical implants being used (such as cardiac pacemakers), resulting in malfunctioning.

Safety Labels

To ensure safe operations, comply with safety signs on the equipment and do not damage or remove the safety labels. See the following table for descriptions of the safety labels:

Safety Labels	Description
	• Connect the PE terminal properly to prevent electric shock. Read through the guide and follow the safety instructions before use. • Do not touch terminals within 15 minutes after powering off to prevent electric shock. • Do not touch the heat sink with power on to prevent burns.

1 Function Overview

Functions of the servo drive are listed below. See details in corresponding chapters.

Function	Description
Cyclic synchronous position mode	The host controller generates position references and sends the references cyclically through the bus. The servo drive performs positioning control.
Cyclic synchronous velocity mode	The host controller generates speed references and sends the references cyclically through the bus. The servo drive performs speed control.
Cyclic synchronous torque mode	The host controller generates torque references and sends the references cyclically through the bus. The servo drive performs torque control.
Profile position mode	The host controller sets parameters through the bus, and the servo drive generates position references and performs positioning control.
Profile velocity mode	The host controller sets parameters through the bus, and the servo drive generates speed references and performs speed control.
Profile torque mode	The host controller sets parameters through the bus, and the servo drive generates torque references and performs torque control.
Homing mode	The host controller selects the homing mode through parameters, and the drive performs homing automatically with the position feedback set to the preset value.
Touch Probe	The servo drive latches the position information when an external DI signal or motor Z signal changes.
High-resolution encoder	The servo drive is equipped with a high-performance encoder with resolution up to 8388608 PPR.
Mechanical characteristics analysis	Used to analyze the resonance frequency and characteristics of the mechanical system through a PC installed with Inovance software tool.
Gain auto-tuning	The servo drive generates gain parameters automatically to match present working conditions through just one parameter.
Gain switchover	Used to apply different gains to different status (operating or stop) of the motor. Gains can also be switched by bit26 of OD 60FE during operation.
Torque disturbance observer	The servo drive estimates the disturbance torque suffered by the system to suppress vibration through compensation.
Resonance suppression	The servo drive sets filter characteristics automatically to suppress mechanical system vibration after detecting the resonance point.
Torque Reference Filter	Used to suppress the mechanical resonance that may be generated when the response speed is excessively high.

Function	Description
Position first-order low-pass filter	Used to achieve smooth acceleration and deceleration.
Torque limit	The servo drive limits the output torque of the servo motor.
Speed limit	The servo drive limits the servo motor speed.
External regenerative resistor	Used in case of insufficient braking capacity of the built-in regenerative resistor.
DI signal assignment	DI functions such as emergency stop can be assigned to corresponding pins.
Fault log	Used to record the latest twenty faults/warnings, which can also be cleared.
Status display	Used to display the drive status through the LED on the keypad.
External I/O display	Used to display ON/OFF status of external I/O signals.
Forced DO	Used to output signals not related to the drive status forcibly or used to check the wiring of output signals.
Trial run mode	Used to enable the motor through the keypad without a start signal.
Inovance software tool	Used to set parameters, perform trial run, and check status through a PC.
Warning code output	Used to output a four-bit warning code when a warning occurs.
Position Comparison	The servo drive outputs a DO signal with designated width after reaching the preset target position.
Black box	The servo drive captures the data before and after the designated condition and cooperates with the software tool to read the data for further analysis.

2 Basic Functions of the Servo Drive

The servo system consists of three major parts, the servo drive, servo motor, and feedback encoder.

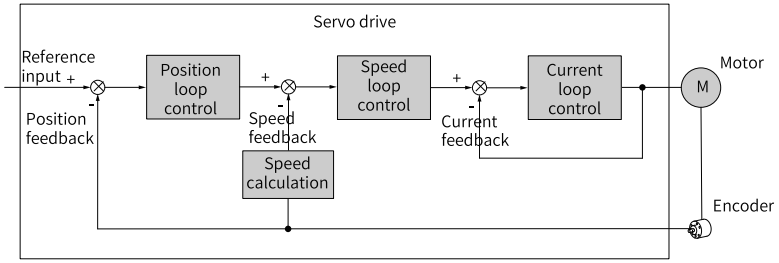


Figure 2-1 Structure of a basic servo system

As the control core of the servo system, the servo drive performs accurate position, speed, torque, or hybrid control on the servo motor by processing the input signals and feedback signals. Position control is the most important mode of a servo system.

Descriptions of the control modes are as follows:

- Position control In the position control mode, the target position of a motor is determined by the sum of position references, and the motor speed is determined by the position reference frequency. The servo drive performs quick and accurate position control and speed control through the feedback encoder installed on the motor. The position control mode mainly applies to applications requiring positioning control, such as manipulators, SMT machines, engraving and milling machines, and CNC machine tools.
- Speed control In the speed control mode, the servo drive performs quick and accurate speed control through the speed reference sent through communication. The speed control mode mainly applies to application requiring speed control or where a host controller is used for position control or the commands sent from the host controller are used as the speed references for the servo drive, such as the engraving and milling machine.
- In the torque control mode, the motor current is in linear relation with the torque. Therefore, torque control is implemented through current control. The servo drive controls the motor output torque based on torque references. The torque reference can be set through communication. This control mode is mainly applicable to the winding and unwinding devices with strict tension requirements. In these scenarios, the torque always changes with the winding radius so that the tension will not change along with the change of the winding radius.

2.1 Conversion Factor

Gear ratio refers to the motor displacement (unit) to the load shaft displacement of one reference unit.

The gear ratio is comprised of the numerator 6091.01h and the denominator 6091.02h. It determines the proportional relation between the load shaft displacement (reference unit) and the motor displacement (encoder unit), as shown below.

Motor displacement = Load shaft displacement x Gear ratio

The motor is connected to the load through the reducer and other mechanical transmission mechanism. The gear ratio is related to the mechanical reduction ratio, mechanical dimensions and motor resolution.

The calculation formula is as follows.

$$\text{Gear ratio} = \frac{\text{Motor encoder resolution}}{\text{Load shaft resolution}}$$

☆Related parameters:

For details, see *"6091_en.01h" on page 361*.

For details, see *"6091_en.02h" on page 361*.

Take the load ball screw as an example:

Minimum reference unit f_C = 1 mm

Lead P_B = 10 mm/r

Reduction ratio n = 5:1

Resolution of Inovance 23-bit motor (P) = 8388608 PPR

The position factor is calculated as follows:

Position factor:

$$\text{Position factor} = \frac{\text{Motor resolution P} \times \text{n}}{P_B} = \frac{8388608 \times 5}{10} = \frac{41943040}{10} = 4194304$$

Therefore, 6091.01h = 33554432; 6091.02h = 1. That means when the load shaft displacement is 1 mm, the motor displacement is 33554432.

Reduce the values of 6091.01h and 6091.02h to a point where there is no common divisor, and take the final value.

2.2 Servo States

Follow the process stipulated in the CiA402 protocol when operating the servo drive. Otherwise, the servo drive cannot run in the designated status.

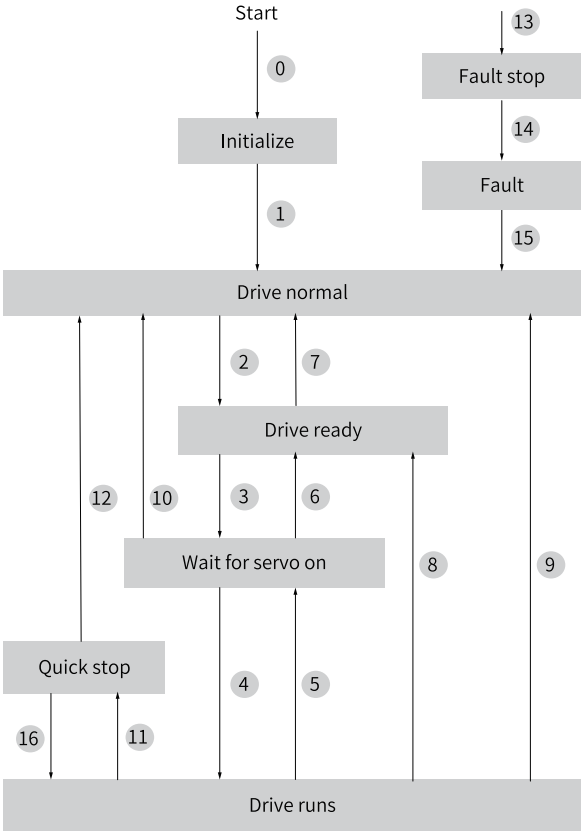


Figure 2-2 Switchover of CiA402 state machine

The following table describes different states.

Initialization	Initialization of the servo drive and internal self-inspection are completed. Parameters cannot be set and the driving function cannot be executed.
No fault	No fault exists in the servo drive or the fault has been cleared. Parameters can be set.
Ready to switch on	The servo drive is ready to run. Parameters can be set.
Wait for the S-ON signal	The servo drive is waiting for the S-ON signal. Parameters can be set.
Servo operating	The servo drive is operating properly and a certain operation mode has been enabled. The motor is energized and starts rotating when the speed reference value inputted is not 0. Only parameters whose "Setting Condition" is "During running" can be set.
Quick stop	Quick stop is activated and the servo drive is in the process of quick stop. Only parameters whose "Setting Condition" is "During running" can be set.
Stop at fault	A fault occurs and the servo drive is in the process of stop. Only parameters whose "Setting Condition" is "During running" can be set.
Fault	The stop process is done and all the drive functions are disabled. Parameters can be modified for troubleshooting purpose.

The following table describes the control commands and status switchover.

CiA402 state switchover		Control word 6040h	bit0 to bit9 [1] of status word 6041h
0	Power-on → Initialization	Natural transition, control command not required	0x0000
1	Initialization → No fault	Natural transition, control command not required If an error occurs during initialization, the servo drive directly enters status 13.	0x0250/0x270
2	No fault → Servo ready	0x0006	0x0231
3	Servo ready → Waiting for the S-ON signal	0x0007	0x0233
4	Waiting for the S-ON signal → Servo running	0x000F	0x0237

CiA402 state switchover		Control word 6040h	bit0 to bit9 [1] of status word 6041h
5	Servo running → Waiting for the S-ON signal	0x0007	0x0233
6	Waiting for the S-ON signal → Servo ready	0x0006	0x0231
7	Servo ready → No fault	0x0000	0x0250
8	Servo running → Servo ready	0x0006	0x0231
9	Servo running → No fault	0x0000	0x0250
10	Waiting for the S-ON signal → No fault	0x0000	0x0250
11	Servo running → Quick stop	0x0002	0x0217
12	Quick stop → No fault	Set 605A to a value between 0 and 3. Natural transition applies after stop and no control command is required.	0x0250
13	→ Stop at fault	If a fault occurs in any status other than "fault", the servo drive automatically switches to the stop-at-fault state, without the need for a control command.	0x021F
14	Stop at fault → Fault	Natural transition applies after stop and no control command is required.	0x0218
15	Fault → No fault	0x80 Bit7 is rising edge-triggered. bit7 is maintained at 1, and other control commands are ineffective.	0x0250
16	Quick stop → Servo running	Set 605A to a value between 5 and 7. 0x0F will be sent after stop.	0x0237

Note

[1]: bit10 to bit15 of 6041h are related to the operating state of the servo drive, and their values are represented as "0" in the preceding table. For details on the status of these bits, check the operation mode of the servo drive.

☆Related parameters:

For details, see *" 6040h" on page 347*.

For details, see *" 6041h" on page 347*.

2.3 Operation Modes

Introduction to servo operation modes

SV660ND series servo drives support 7 servo modes. The pre-operational mode is set in 6060h. The current operation mode of the servo drive can be viewed in 6061h.

☆Related parameters

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

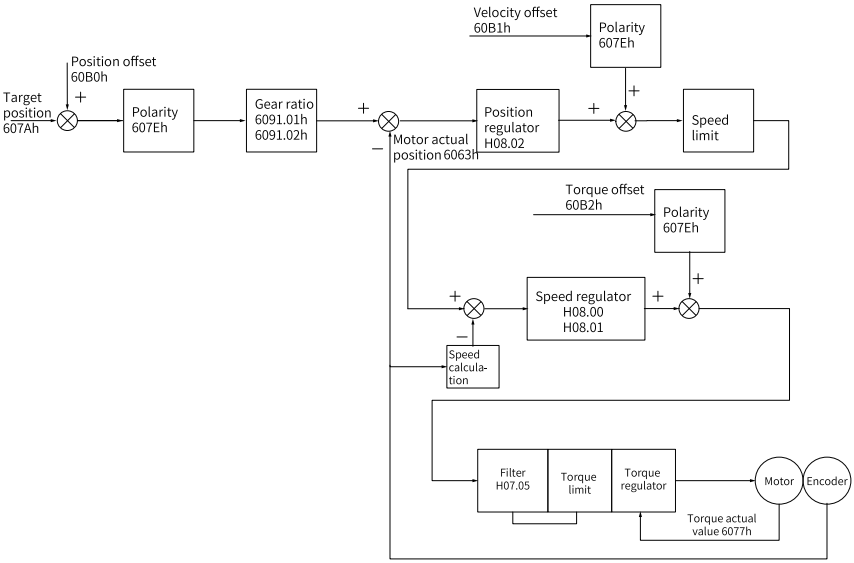
Communication cycle supported by each mode

SV660ND series servo drives support a synchronization cycle of 1 ms or an integer multiple of 1 ms. The maximum synchronization cycle is 20 ms.

2.4 Cyclic Synchronous Position (CSP) Mode

In CSP mode, the host controller generates the position references and sends the target position to the servo drive cyclically. The servo drive executes position control, speed control, and torque control.

2.4.1 Function Block Diagram



2.4.2 Configuration Block Diagram

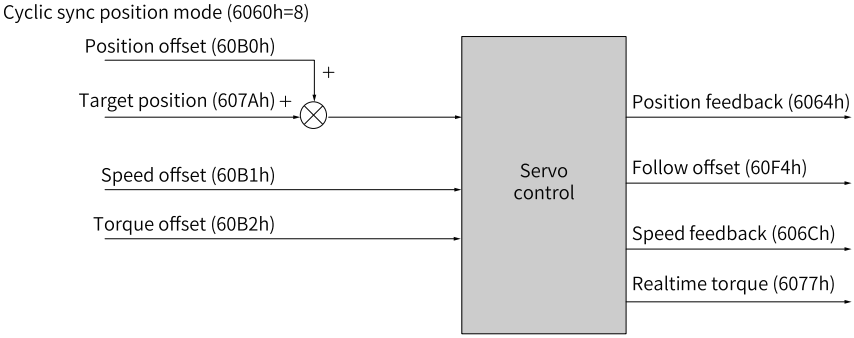


Figure 2-3 Cyclic synchronous position mode

2.4.3 Recommended Configuration

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
607Ah: target position	6064h: position actual value	Mandatory
6060h: modes of operation	6061h: modes of operation display	Optional

2.4.4 Related Parameters

6040h **Control word**

Communication address:	0x3502		
Min.:	0	Unit:	-
Max.:	65535	Data type:	Uint16
Default:	-	Change mode:	Real time
Access:	RW	Mapping:	RPDO

Value range

0 to 65535

Description

Defines the control command:

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Enable operation	Enable operation	1: Active; 0: Inactive

The CSP mode only supports absolute position references.

6041h **Status word**

Communication address:	0x3504		
Min.:	-	Unit:	-
Max.:	-	Data type:	Uint16
Default:	-	Change mode:	-
Access:	RO	Mapping:	TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	Switch on	Switch on	1: Active; 0: Inactive
2	Enable operation	Operation enabled	1: Active; 0: Inactive
3	Fault	Fault	1: Active; 0: Inactive

bit	Parameter		Description
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	Not supported, always being 1
11	Internal limit active	Internal limit active	0: Position reference within the limit 1: Position reference beyond the limit
12	Drive follows the command value	Drive follows the command value	Not supported, always being 1
13	Following error	Following error	0: EB00.0 (Excessive position deviation) not reported 1: EB00.0 (Excessive position deviation) reported
14	Manufacturer specific	Manufacturer specific	Undefined
15	Home find	Home find	0: Home not found 1: Home found

☆Related parameters:

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

For details, see *" 6064h" on page 352*.

For details, see *" 6066h" on page 353*.

For details, see *" 606Ch" on page 354*.

For details, see *" 6077h" on page 356*.

For details, see *" 607Ah" on page 357*.

For details, see *" 607Eh" on page 358*.

For details, see *" 60B0h" on page 364*.

For details, see *" 60B1h" on page 364*.

For details, see *" 60B2h" on page 365*.

For details, see *" 60F4h" on page 371*.

2.4.5 Related Function Settings

Position deviation monitoring function

☆Related parameters:

For details, see *" 6065h" on page 353*.

For details, see *" 6066h" on page 353*.

Position reference polarity

You can change the position reference direction through setting the position reference polarity.

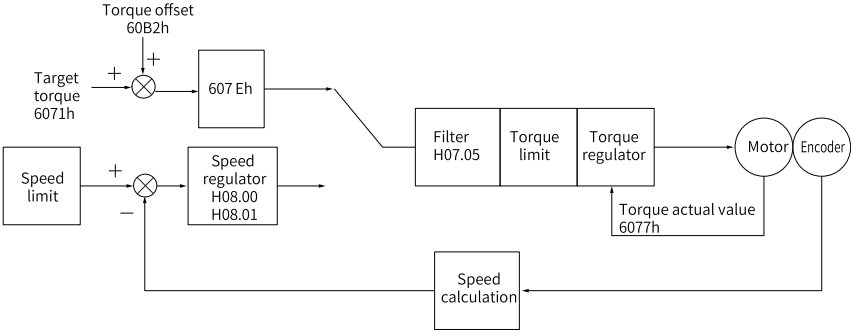
☆Related parameters:

For details, see *" 607Eh" on page 358*.

2.5 Cyclic Synchronous Torque Mode (CST)

In CST mode, the host controller sends the target torque to the servo drive through cyclic synchronization. The servo drive executes torque control.

2.5.1 Function Block Diagram



2.5.2 Configuration Block Diagram

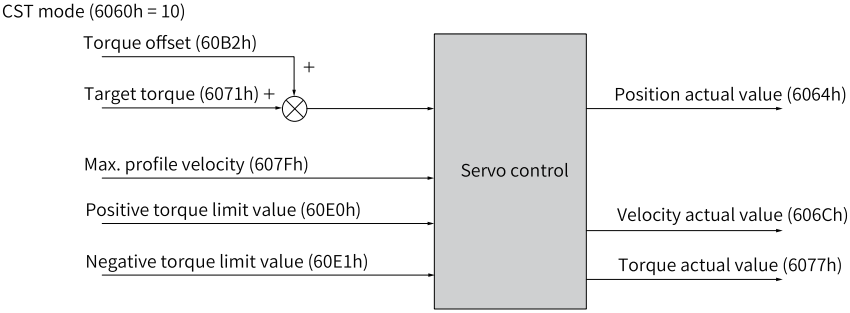


Figure 2-4 CST mode

2.5.3 Recommended Configuration

The basic configuration for the CST mode is described in the following table.

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
6071h: target torque	-	Mandatory
-	6064h: position actual value	Optional
-	606Ch: velocity actual value	Optional
-	6077h: torque actual value	Optional
6060h: modes of operation	6061h: modes of operation display	Optional

2.5.4 Related Parameters

6040h **Control word**

Communication address:	0x3502		
Min.:	0	Unit:	-
Max.:	65535	Data type:	Uint16
Default:	-	Change mode:	Real time
Access:	RW	Mapping:	RPDO

Value range

0 to 65535

Description

Defines the control command.

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Servo running	Enable operation	1: Active; 0: Inactive

6041h **Status word**

Commu-nication address: 0x3504

Min.:	-	Unit:	-
Max.:	-	Data type:	Uint16
Default:	-	Change mode:	-
Access:	RO	Mapping:	TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	S-ON	Switch on	1: Active; 0: Inactive
2	Operation enabled	Operation enabled	1: Active; 0: Inactive
3	Fault	Fault	1: Active; 0: Inactive
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	Not supported, always being 1
11	Internal limit active	Internal limit active	0: Position reference within the limit 1: Position reference beyond the limit
12	Drive follows the command value	Drive follows the command value	Not supported, always being 1
13	-	N/A	N/A

bit	Parameter		Description
14	Manufacturer specific	Manufacturer specific	Undefined
15	-	N/A	N/A

☆Related parameters:

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

For details, see *" 6071h" on page 356*.

For details, see *" 6072h" on page 356*.

For details, see *" 6074h" on page 356*.

For details, see *" 6077h" on page 356*.

For details, see *" 607Eh" on page 358*.

For details, see *" 607Fh" on page 359*.

For details, see *" 60B2h" on page 365*.

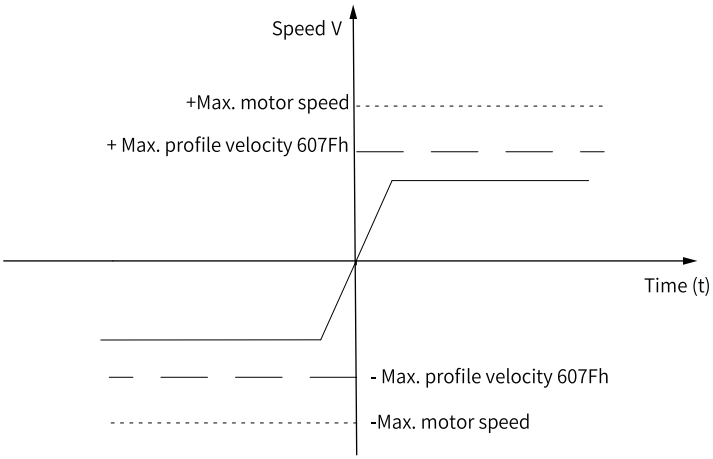
For details, see *" 60E0h" on page 370*.

For details, see *" 60E1h" on page 371*.

2.5.5 Related Function Settings

Speed limit in torque control mode

In torque mode, 607Fh can be used to limit the maximum speed in forward/reverse running, but its value must not exceed the maximum allowable speed of the motor.

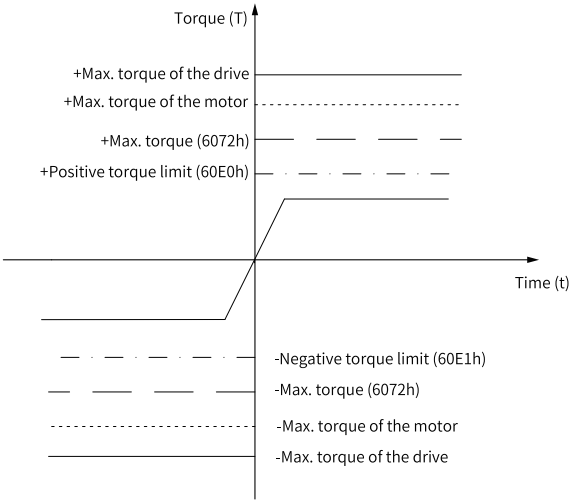


☆Related parameters:

For details, see *" 607Fh" on page 359*.

Torque limit

To protect mechanical devices, you can limit the torque reference in the position, speed, and torque control modes by setting 6072h (Maximum torque), 60E0h (Positive torque limit value), and 60E1h (Negative torque limit value). Note that the maximum torque allowed by the servo drive cannot be exceeded.



☆Related parameters:

For details, see *" 6072h" on page 356*.

For details, see *" 60E0h" on page 370*.

For details, see *" 60E1h" on page 371*.

Torque reference polarity

You can change the torque reference direction through setting the torque reference polarity.

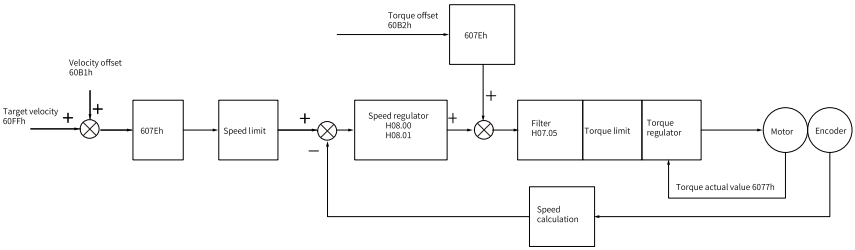
☆Related parameters:

For details, see *" 607Eh" on page 358*.

2.6 Cyclic Synchronous Velocity Mode (CSV)

In this mode, the host controller sends the target speed to the servo drive synchronously. Speed control and torque control are performed by the servo drive.

2.6.1 Function Block Diagram



2.6.2 Configuration Block Diagram

Cyclic sync speed mode (6060h=9)

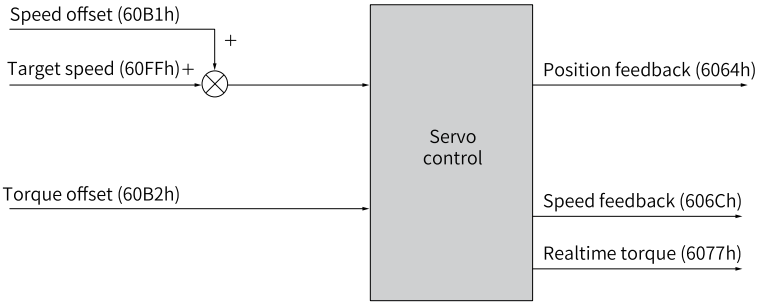


Figure 2-5 CSV mode

2.6.3 Recommended Configuration

The basic configuration for CSV mode is described in the following table.

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
60FFh: target velocity	-	Mandatory
-	6064h: position actual value	Optional
-	606Ch: velocity actual value	Optional
6060h: modes of operation	6061h: modes of operation display	Optional

2.6.4 Related Parameters

6040h **Control word**

Commu- 0x3502
nication
address:

Min.: 0 Unit: -
Max.: 65535 Data type: Uint16
Default: - Change mode: Real time
Access: RW Mapping: RPDO

Value range

0 to 65535

Description

Defines the control command:

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Enable operation	Enable operation	1: Active; 0: Inactive

6041h Status word

Communication address: 0x3504
Min.: - Unit: -
Max.: - Data type: Uint16
Default: - Change mode: -
Access: RO Mapping: TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	Switch on	Switch on	1: Active; 0: Inactive
2	Enable operation	Operation enabled	1: Active; 0: Inactive
3	Fault	Fault	1: Active; 0: Inactive
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined

bit	Parameter		Description
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	Not supported, always being 1
11	Internal limit active	Internal limit active	0: Position reference within the limit 1: Position reference beyond the limit
12	Drive follows the command value	Drive follows the command value	Not supported, always being 1
13	-	N/A	N/A
14	Manufacturer specific	Manufacturer specific	Undefined
15	-	N/A	N/A

☆Related parameters:

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

For details, see *" 6064h" on page 352*.

For details, see *" 606Ch" on page 354*.

For details, see *" 6077h" on page 356*.

For details, see *" 607Eh" on page 358*.

For details, see *" 60B1h" on page 364*.

For details, see *" 60B2h" on page 365*.

For details, see *" 60FFh" on page 372*.

2.6.5 Related Function Settings

Velocity reference polarity

You can change the speed reference direction through setting the speed reference polarity.

☆Related parameters:

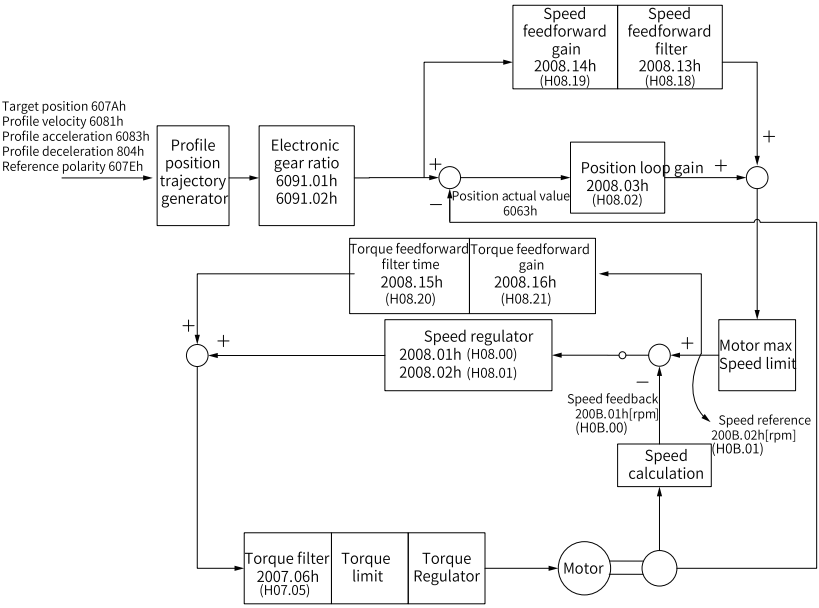
For details, see *" 607Eh" on page 358*.

2.7 Profile Position (PP) Mode

The PP mode mainly applies to point-to-point positioning. In PP mode, the host controller defines the target position, operating speed, and acceleration/ deceleration rate. The position profile generator inside the servo drive generates

the position profile based on settings, and the servo drive executes position control, speed control, and torque control.

2.7.1 Function Block Diagram



2.7.2 Configuration Block Diagram

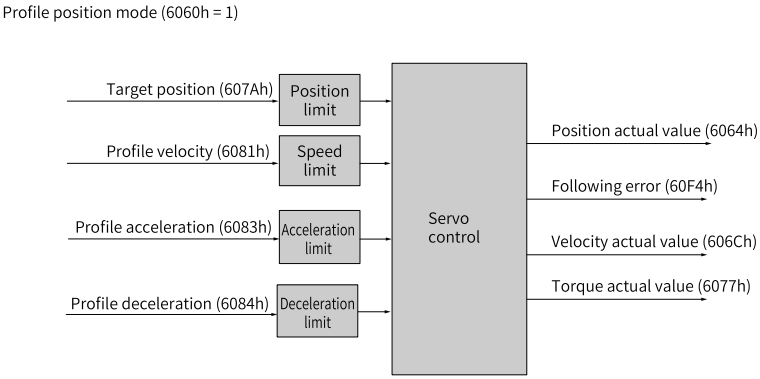


Figure 2-6 Profile position mode

In profile position mode, the target position is triggered and activated based on the time sequence of the new set-point (bit4 of the control word) and set-point acknowledge (bit12 of the status word).

The controller sets the New set-point bit (bit4 of the control word) to 1 to inform the servo drive of the new target position. The servo drive, after receiving the new target position, sets the Set-point acknowledge bit (bit12 of the status word) to 1. After the controller sets the New set-point to 0, if the servo drive can receive the new target position, the Set-point acknowledge bit will be set to 0. Otherwise, it is kept to 1.

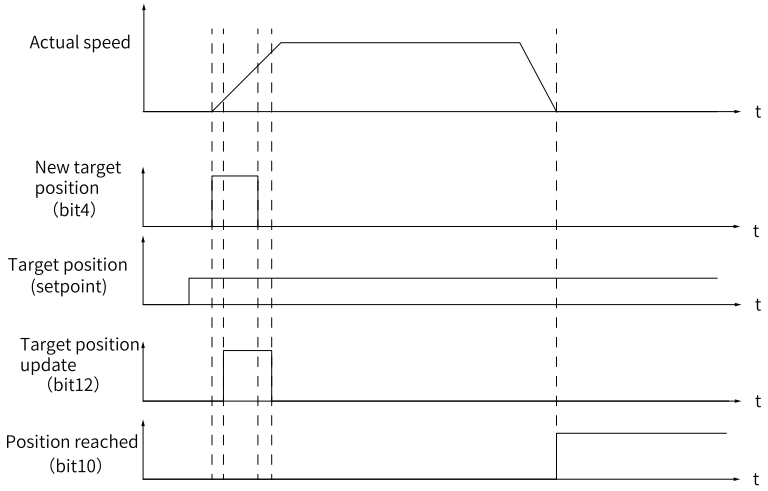


Figure 2-7 Sequence in sequential mode

The linkage mode of position references is determined by bit5 (Change set immediately) of the control word. When bit5 is set to 1 (Sequential mode), sequential linkage applies between position references, which is called sequential mode. When bit5 is set to 0 (Single-point mode), zero-cross linkage applies to position references, which is called single-point mode.

Sequential mode:

The target position of present segment is in the process of positioning. After the new target position is generated, the controller sets bit4 (New set-point) of the control word to 1, and the servo drive executes positioning towards the new target position.

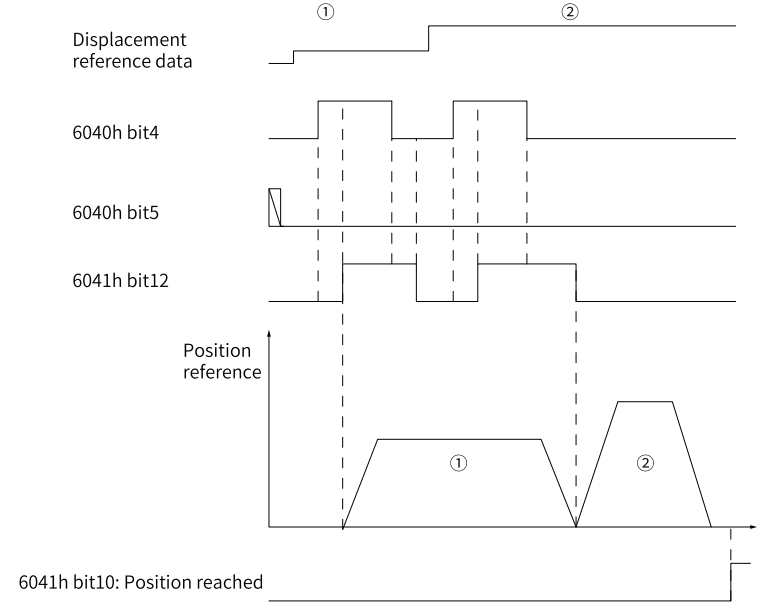
In sequential mode, the sequence diagram of bit4 of the control word (New set-point) and bit12 of the status word (Set-point acknowledge) is as follows.

Single-point mode:

The target position of present segment is in the process of positioning. After the new target position is generated, the controller sets the bit4 (New set-point) of the control

word to 1, and the servo drive executes positioning towards the new target position after the position reference of present segment is done transmitting.

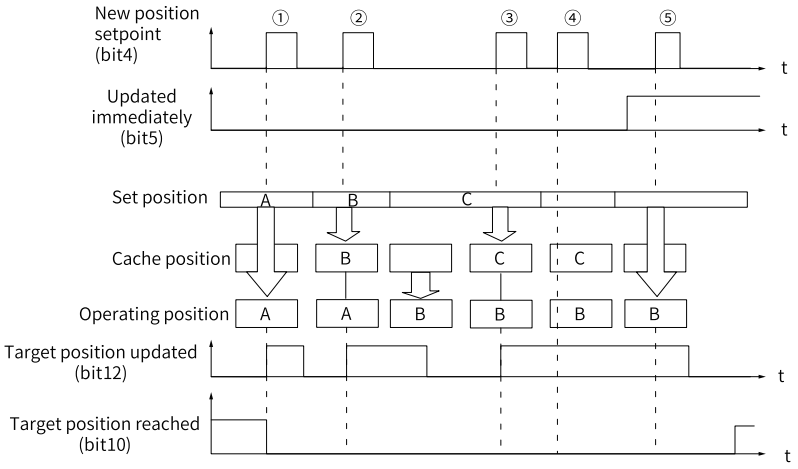
The time sequence diagram of the new set-point (bit4 of the control word) and the set-point acknowledge (bit12 of the status word) is as follows.



Note: If you need to change any parameter of the displacement reference, send the trigger signal again.

Figure 2-8 Sequence in single-point mode

In single-point mode, the servo drive caches one target position, which is to cache a new segment of target position when current target position is under execution. The sequence diagram is as follows.



- ① If the cache position is empty, the set position will be immediately executed.
- ②③ If a position reference is currently under execution, the new position setpoint will be saved in the cache. After the current position reference is transmitted, the cached setpoint will be executed, after which a new setpoint can be received.
- ④⑤ The new setpoints cannot be received if the cache is exhausted. In this case, you can set the attribute bit of the setpoint to 1 (Change set immediately) to activate the setpoint.

2.7.3 Recommended Configuration

The basic configuration for the PP mode is described in the following table.

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
607Ah: target position	6064h: position actual value	Mandatory
6081h: profile velocity	-	Mandatory
6083h: profile acceleration	-	Optional
6084h: profile deceleration	-	Optional
6060h: modes of operation	6061h: modes of operation display	Optional

2.7.4 Related Parameters

6040h **Control word**

Commu- 0x3502
nication
address:

Min.: 0
Max.: 65535
Default: -
Access: RW
Unit: -
Data type: Uint16
Change mode: Real time
Mapping: RPDO

Value range

0 to 65535

Description

Defines the control command:

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Enable operation	Enable operation	1: Active; 0: Inactive
4	New set-point	New set-point	0→1: Trigger new target position 1→0: Clear bit12 of the status word
5	Change set immediately	Change set immediately	0: Target set-point cannot be updated immediately 1: Target set-point can be updated immediately
6	Abs/Rel	Abs/Rel	0: Target position being absolute 1: Target position being relative
8	Halt	Halt	0: Keep present operating state 1: Halt

6041h Status word

Communication address: 0x3504
Min.: -
Max.: -
Default: -
Access: RO
Unit: -
Data type: Uint16
Change mode: -
Mapping: TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	Switch on	Switch on	1: Active; 0: Inactive
2	Enable operation	Operation enabled	1: Active; 0: Inactive
3	Fault	Fault	1: Active; 0: Inactive
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	0: Target position not reached 1: Target position reached
11	Internal limit active	Internal limit active	0: Position reference within the limit 1: Position reference beyond the limit
12	Set-point acknowledge	Set-point acknowledge	0: Set-point can be updated 1: Set-point cannot be updated
13	Following error	Following error	0: EB00.0 (Excessive position deviation) not reported 1: EB00.0 (Excessive position deviation) reported
14	Manufacturer specific	Manufacturer specific	Undefined
15	Home find	Home find	0: Home not found 1: Home found

☆Related parameters:

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

For details, see *" 6064h" on page 352*.

For details, see *" 6065h" on page 353*.

For details, see *" 6066h" on page 353*.

For details, see *" 6067h" on page 353*.

For details, see *" 6068h" on page 354*.

For details, see *" 607Ah" on page 357*.

For details, see *" 607Eh" on page 358*.

For details, see *" 607Fh" on page 359*.

For details, see *" 6081h" on page 359*.

For details, see *" 6083h" on page 359*.

For details, see *" 6084h" on page 360*.

2.7.5 Related Function Settings

Positioning completed

Positioning completed: When position deviation fulfills the set condition, the positioning process is completed. In this case, the servo drive sets bit10 of the status word, and the host controller, once receives the signal, acknowledges that positioning is completed.

☆Related parameters:

For details, see *" 6067h" on page 353*.

For details, see *" 6068h" on page 354*.

Position deviation monitoring function

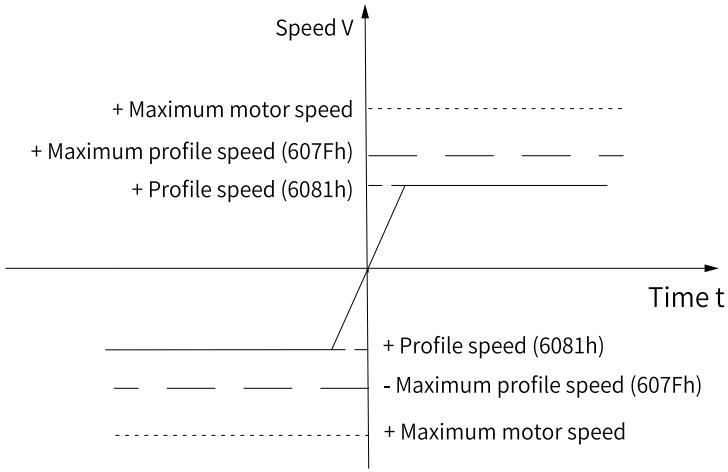
☆Related parameters:

For details, see *" 6065h" on page 353*.

For details, see *" 6066h" on page 353*.

Speed limit

In profile position mode, 607Fh can be used to limit the maximum speed in forward/ reverse running, but its value must not exceed the max. allowable speed of the motor.



☆Related parameters:

For details, see *" 607Fh" on page 359*.

Acceleration and deceleration limits

In profile position mode, the change rate of position references can be limited through the acceleration and deceleration limits.

☆Related parameters:

For details, see *" 6083h" on page 359*.

For details, see *" 6084h" on page 360*.

Polarity

You can change the position reference direction through setting the position reference polarity.

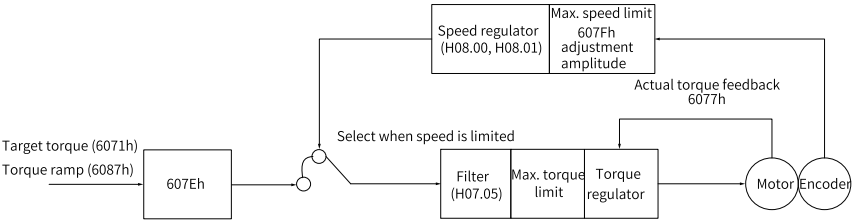
☆Related parameters:

For details, see *" 607Eh" on page 358*.

2.8 Profile Torque (PT) Mode

In PT mode, the host controller sends the target torque in 6071h and torque slope in 6087h to the servo drive. The servo drive profiles the torque reference curve and executes torque control.

2.8.1 Function Block Diagram



2.8.2 Configuration Block Diagram

Profile torque mode (6060h = 4)

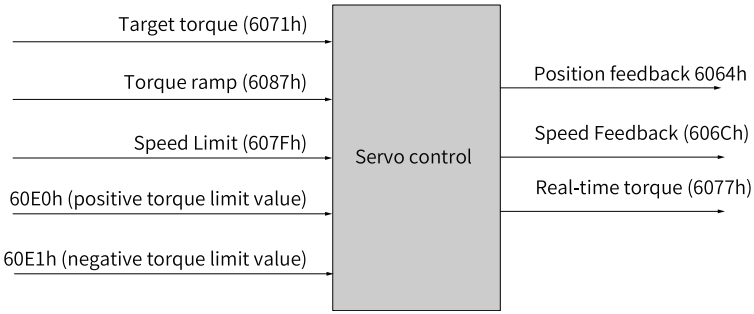


Figure 2-9 PT mode

2.8.3 Recommended Configuration

The basic configuration for the profile torque mode is described in the following table.

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
6071h: target torque	-	Mandatory
6087h: Torque slope	-	Optional
-	6064h: position actual value	Optional
-	606Ch: velocity actual value	Optional
-	6077h: torque actual value	Optional
6060h: modes of operation	6061h: modes of operation display	Optional

2.8.4 Related Parameters

6040h **Control word**

Communication address:	0x3502		
Min.:	0	Unit:	-
Max.:	65535	Data type:	Uint16
Default:	-	Change mode:	Real time
Access:	RW	Mapping:	RPDO

Value range

0 to 65535

Description

Defines the control command.

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Enable operation	Enable operation	1: Active; 0: Inactive
8	Halt	Halt	0: Keep present operating state, 1: Halt

6041h **Status word**

Communication address:	0x3504		
Min.:	-	Unit:	-
Max.:	-	Data type:	Uint16
Default:	-	Change mode:	-
Access:	RO	Mapping:	TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	S-ON	Switch on	1: Active; 0: Inactive
2	Servo running	Operation enabled	1: Active; 0: Inactive

bit	Parameter		Description
3	Fault	Fault	1: Active; 0: Inactive
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	0: Target velocity not reached 1: Target velocity reached
11	Internal limit active	Internal limit active	0: Position feedback within the limit 1: Position feedback beyond the limit
12 to 14	No assignment	N/A	No assignment, always being 0
15	-	N/A	N/A

☆Related parameters:

For details, see *" H07_en.17" on page 198*.

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

For details, see *" 6064h" on page 352*.

For details, see *" 6072h" on page 356*.

For details, see *" 6074h" on page 356*.

For details, see *" 6077h" on page 356*.

For details, see *" 607Eh" on page 358*.

For details, see *" 607Fh" on page 359*.

For details, see *" 6087h" on page 360*.

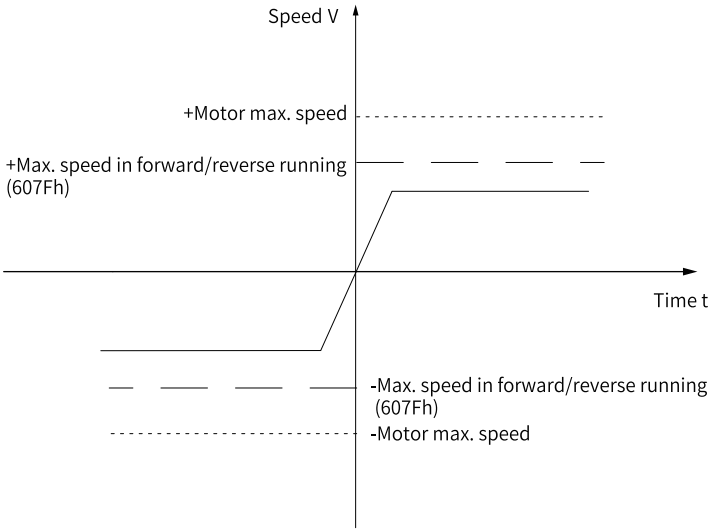
For details, see *" 60E0h" on page 370*.

For details, see *" 60E1h" on page 371*.

2.8.5 Related Function Settings

Speed limit in torque control mode

In torque mode, 607Fh can be used to limit the maximum speed in forward/reverse running, but its value must not exceed the maximum allowable speed of the motor.

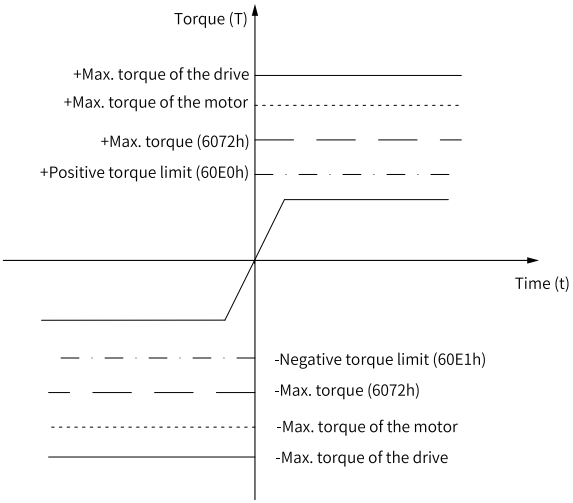


☆Related parameters:

For details, see *" 6087h" on page 360*.

Torque limit

To protect mechanical devices, you can limit the torque reference in position, speed, and torque control modes by setting 6072h (Maximum torque), 60E0h (Positive torque limit value), and 60E1h (Negative torque limit value). Note that the maximum torque allowed by the servo drive cannot be exceeded.



☆Related parameters:

For details, see *" 6072h" on page 356*.

For details, see *" 60E0h" on page 370*.

For details, see *" 60E1h" on page 371*.

Torque reference polarity

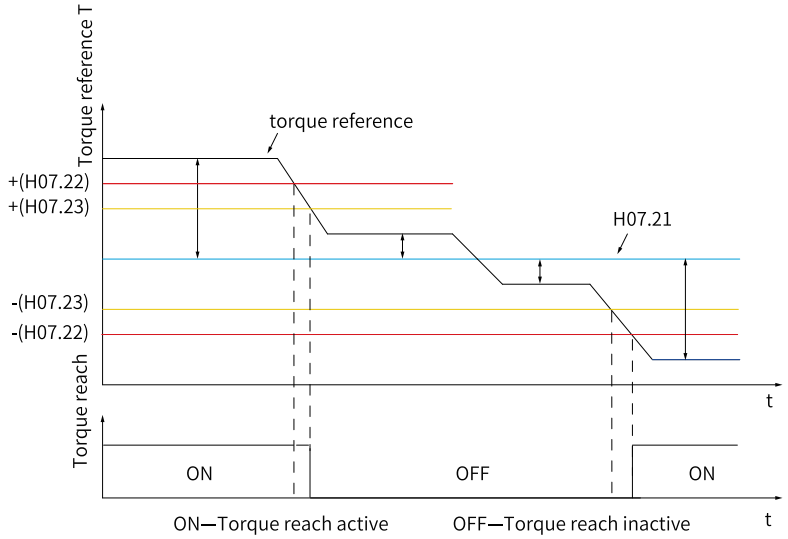
You can change the torque reference direction through setting the torque reference polarity.

☆Related parameters:

For details, see *" 607Fh" on page 359*.

Monitoring on torque reach

The torque reach function is used to determine whether the torque reference value reaches the set torque base value. If yes, a corresponding torque reach signal will be output to the host controller.

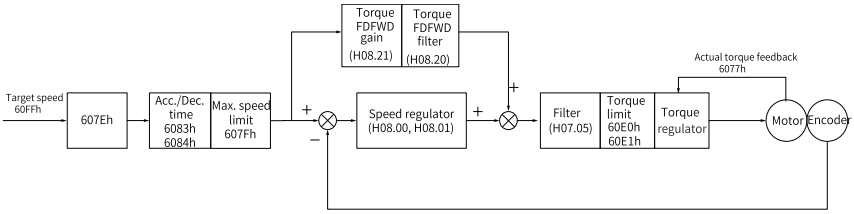


If the absolute difference between the torque reference and H07.21 (Base value for torque reach) is higher than H07.22 (Threshold for valid torque reach), the torque reach signal is active. Otherwise, the original status applies.

2.9 Profile Velocity (PV) Mode

In PV mode, the host controller sends the target speed, acceleration, and deceleration to the servo drive. The servo drive profiles the speed reference curve and executes speed control and torque control.

2.9.1 Function Block Diagram



2.9.2 Configuration Block Diagram

Profile velocity mode (6060h = 3)

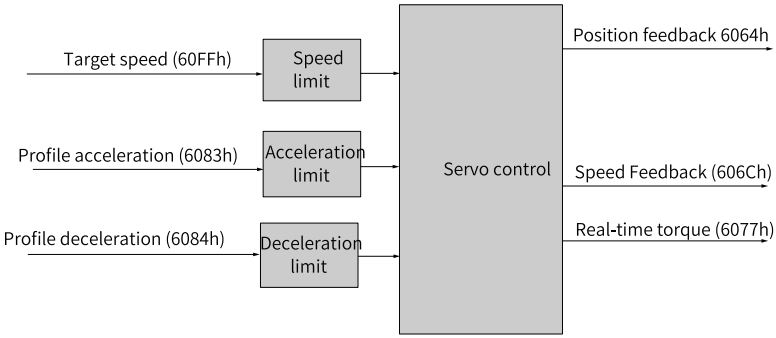


Figure 2-10 PV mode

2.9.3 Recommended Configuration

The basic configuration for the PV mode is described in the following table.

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
60FFh: target velocity	-	Mandatory
-	6064h: position actual value	Optional
-	606Ch: velocity actual value	Optional
6083h: profile acceleration	-	Optional
6084h: profile deceleration	-	Optional
6060h: modes of operation	6061h: modes of operation display	Optional

2.9.4 Related Parameters

6040h **Control word**

Communication address:	0x3502		
Min.:	0	Unit:	-
Max.:	65535	Data type:	Uint16
Default:	-	Change mode:	Real time
Access:	RW	Mapping:	RPDO

Value range

0 to 65535

Description

Defines the control command:

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Enable operation	Enable operation	1: Active; 0: Inactive
8	Halt	Halt	0: Keep present operating state, 1: Halt

6041h **Status word**

Communication address:	0x3504		
Min.:	-	Unit:	-
Max.:	-	Data type:	Uint16
Default:	-	Change mode:	-
Access:	RO	Mapping:	TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	Switch on	Switch on	1: Active; 0: Inactive
2	Operation enabled	Operation enabled	1: Active; 0: Inactive
3	Fault	Fault	1: Active; 0: Inactive
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	0: Target velocity not reached 1: Target velocity reached

bit	Parameter		Description
11	Internal limit active	Internal limit active	0: Position feedback within the limit 1: Position feedback beyond the limit
12	Speed	Speed	0: Speed not being 0 1: Speed being 0
13	-	N/A	N/A
14	Manufacturer specific	Manufacturer specific	Undefined
15	-	N/A	N/A

☆Related parameters:

For details, see *" 606Ch" on page 354*.

For details, see *" 606Dh" on page 354*.

For details, see *" 606Eh" on page 355*.

For details, see *" 606Fh" on page 355*.

For details, see *" 6070h" on page 355*.

For details, see *" 607Eh" on page 358*.

For details, see *" 607Fh" on page 359*.

For details, see *" 6083h" on page 359*.

For details, see *" 6084h" on page 360*.

For details, see *" 60FFh" on page 372*.

2.9.5 Related Function Settings

Monitoring on speed reach status

This function is used to check whether the speed reference of the servo drive is consistent with the motor speed feedback.

☆Related parameters:

For details, see *" 606Dh" on page 354*.

For details, see *" 606Eh" on page 355*.

Monitoring on zero speed

This function is used to check whether the absolute value of motor speed feedback is lower than the set threshold. If yes, the motor is close to a standstill (zero speed) and bit12 of the status word is set to 1.

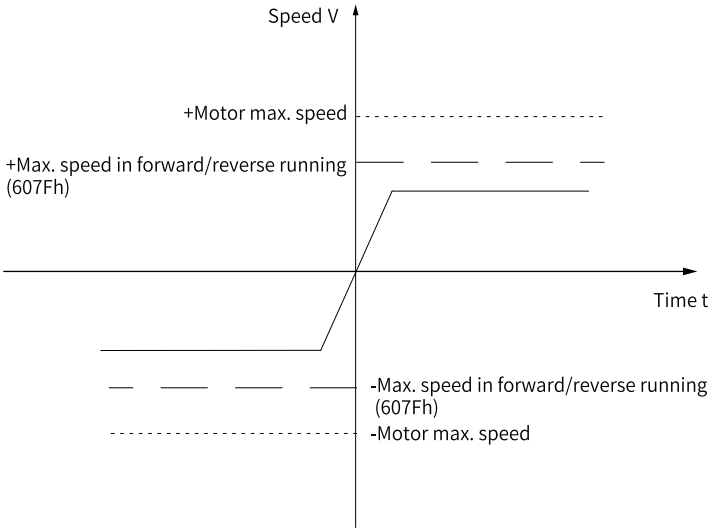
☆Related parameters:

For details, see *" 606Fh" on page 355*.

For details, see *" 6070h" on page 355*.

Speed limit

In profile velocity mode, 607Fh can be used to limit the maximum speed in forward/reverse running, but its value must not exceed the maximum allowable speed of the motor.



☆Related parameters:

For details, see *" 607Fh" on page 359*.

Acceleration and deceleration limits

In profile velocity mode, the change rate of speed references can be limited through acceleration and deceleration limits.

☆Related parameters:

For details, see *" 60C5h" on page 369*.

For details, see *" 60C6h" on page 369*.

Polarity

You can change the speed reference direction through setting the speed reference polarity.

☆Related parameters:

For details, see *" 607Eh" on page 358*.

2.10 Homing Mode (HM)

The homing mode is used to search for the mechanical home and determine the position relation between the mechanical home and mechanical zero.

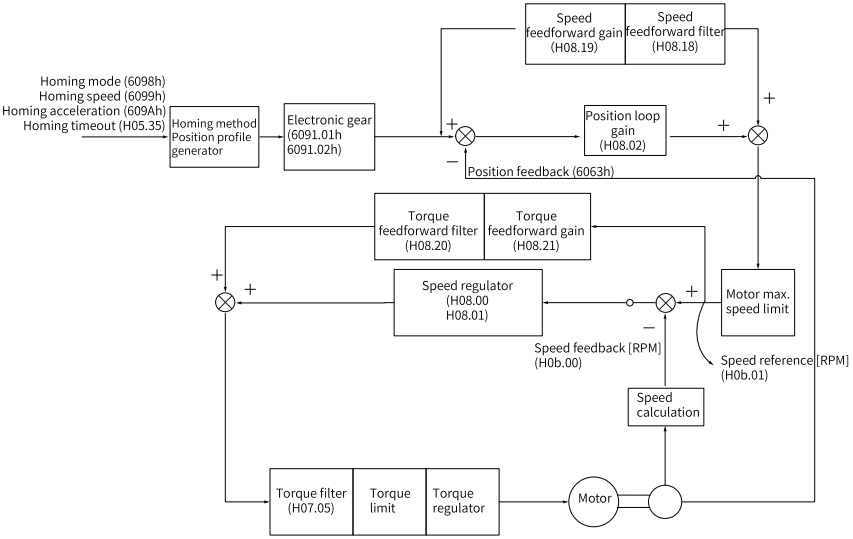
- Home: mechanical home reference point, that is, the motor Z signal.
- Mechanical zero: absolute zero point on the machine

After homing is done, the motor stops at the mechanical home. The relation between the mechanical home and mechanical zero can be set in 607Ch.

Mechanical home = Mechanical zero + 607Ch (Home offset)

When 607Ch = 0, the zero is the same as the home.

2.10.1Function Block Diagram



2.10.2Configuration Block Diagram

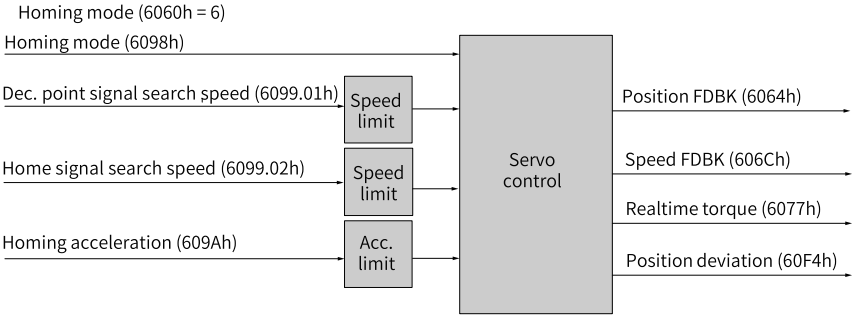


Figure 2-11 Homing mode

2.10.3Recommended Configuration

The basic configuration for the homing mode is shown in the following table.

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
6098h: homing method	-	Optional
6099.01h: speed during search for switch	-	Optional
6099.02h: speed during search for zero	-	Optional
609Ah: homing acceleration	-	Optional
-	6064h: position actual value	Optional
6060h: modes of operation	6061h: modes of operation display	Optional

2.10.4Related Parameters

6040h **Control word**

Communication address:	0x3502		
Min.:	0	Unit:	-
Max.:	65535	Data type:	Uint16
Default:	-	Change mode:	Real time
Access:	RW	Mapping:	RPDO

Value range

0 to 65535

Description

Defines the control command:

bit	Parameter		Description
0	Switch on	Switch on	1: Active; 0: Inactive
1	Enable voltage	Enable voltage	1: Active; 0: Inactive
2	Quick stop	Quick stop	0: Active; 1: Inactive
3	Enable operation	Enable operation	1: Active; 0: Inactive
4	Enable homing	Enable homing	0→1: Start, 1→0: Stop
8	Halt	Halt	0: Keep present operating state, 1: Halt

6041h **Status word**

Commu-nication address: 0x3504

Min.: -
Max.: -
Default: -
Access: RO
Unit: -
Data type: Uint16
Change mode: -
Mapping: TPDO

Value range

-

Description

Indicates the servo drive status.

bit	Parameter		Description
0	Ready to switch on	Ready to switch on	1: Active; 0: Inactive
1	Switch on	Switch on	1: Active; 0: Inactive
2	Enable operation	Operation enabled	1: Active; 0: Inactive
3	Fault	Fault	1: Active; 0: Inactive
4	Voltage enabled	Voltage enabled	1: Active; 0: Inactive
5	Quick stop	Quick stop	0: Active; 1: Inactive
6	Switch on disabled	Switch on disabled	1: Active; 0: Inactive
7	Warning	Warning	1: Active; 0: Inactive
8	Manufacturer specific	Manufacturer specific	Undefined
9	Remote	Remote	1: Active, control word activated 0: Inactive
10	Target reach	Target reach	1: Home located or homing interrupted 0: Disabled or home is not found
12	Homing attained	Homing attained	0: Home signal not found 1: Home signal found
13	Homing error	Homing error	0: Homing error not occurred 1: Homing error occurred
15	Home find	Home find	0: Home not found 1: Home found

☆Related parameters:

For details, see *" 6060h" on page 350*.

For details, see *" 6061h" on page 351*.

For details, see *" 6065h" on page 353*.

For details, see *" 6066h" on page 353*.

For details, see *" 6098h" on page 362*.

For details, see *" 6099_en.01h" on page 363*.

For details, see *" 6099_en.02h" on page 363*.

For details, see *" 609Ah" on page 364*.

For details, see *" 607Ch" on page 357*.

For details, see *" 607Fh" on page 359*.

For details, see *" 60C5h" on page 369*.

2.10.5Related Function Settings

Homing timeout

When the homing duration exceeds the value defined by H05.35 (Homing time limit), the servo drive reports E601.0 (Homing timeout).

E601.0 can be used to determine whether the homing speed, the acceleration setpoint are proper and whether the deceleration point signal and home signal are connected properly.

☆Related parameters:

For details, see *" H05_en.35" on page 181*.

Actual position calculation method

After homing, the calculation method for current mechanical position can be set in 60E6h.

☆Related parameters:

For details, see *" 607Fh" on page 359*.

For details, see *" 609Ah" on page 364*.

Position deviation monitoring function

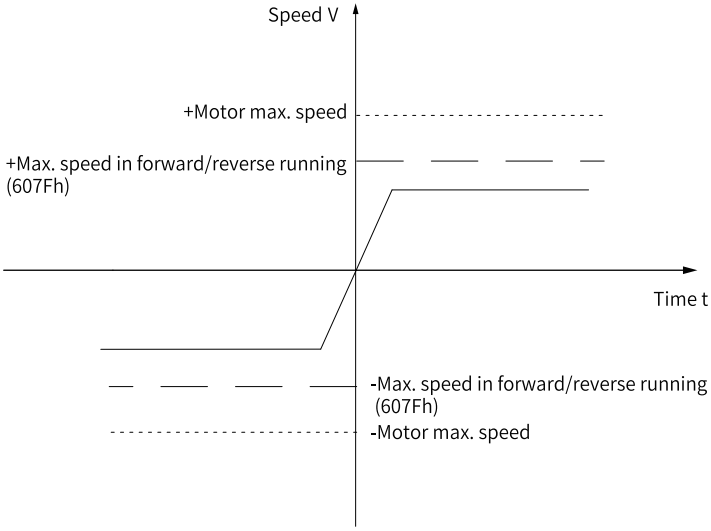
☆Related parameters:

For details, see *" 6065h" on page 353*.

For details, see *" 6066h" on page 353*.

Speed limit

In torque mode, 607Fh can be used to limit the maximum speed in forward/reverse running, but its value must not exceed the maximum allowable speed of the motor.



☆Related parameters:

For details, see *" 607Fh" on page 359*.

Acceleration limit

In homing mode, the change rate of position references can be limited through the acceleration limit.

☆Related parameters:

For details, see *" 60C5h" on page 369*.

2.10.6Homing Operation

6098h = 1

Mechanical home: motor Z signal

Deceleration point: negative limit switch

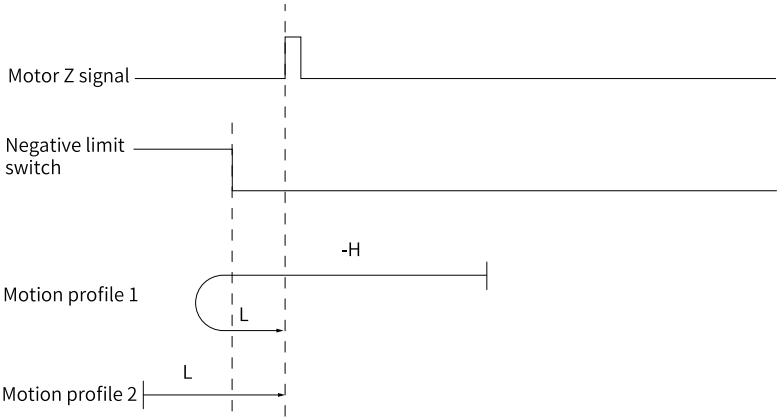


Figure 2-12 Motor running curve and speed in mode 1

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

Note

In the figure, "H" represents high speed 6099.01h, and "L" represents low speed 6099.02h, and “-” indicates reverse run.

6098h = 2

Home: Z signal

Deceleration point: positive limit switch

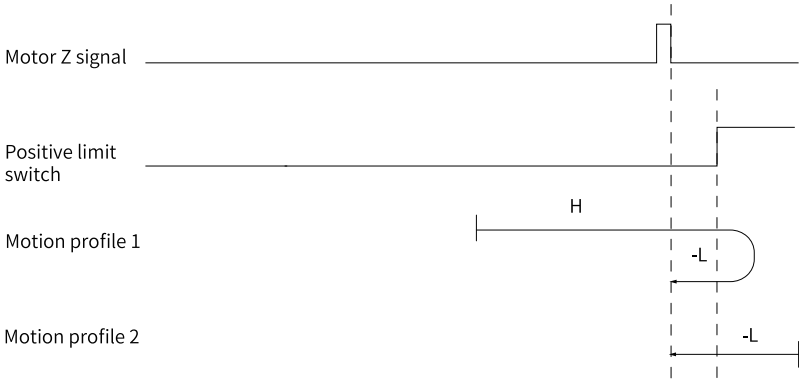


Figure 2-13 Motor running curve and speed in mode 2

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.

- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 3

Home: Z signal

Deceleration point: home switch (HW)

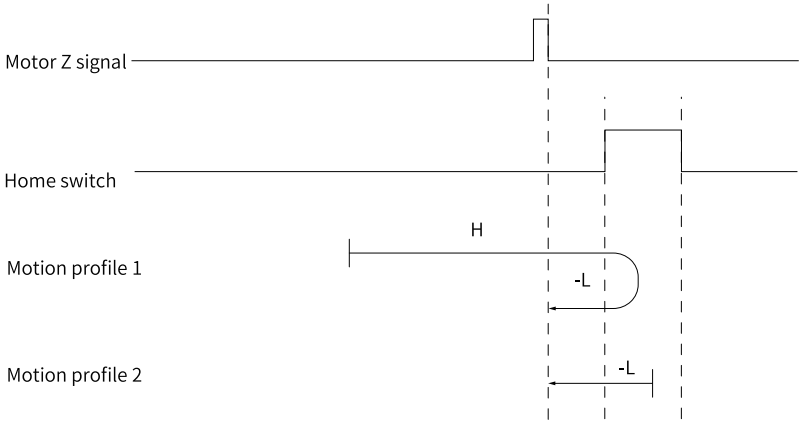


Figure 2-14 Motor running curve and speed in mode 3

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 4

Home: Z signal

Deceleration point: home switch (HW)

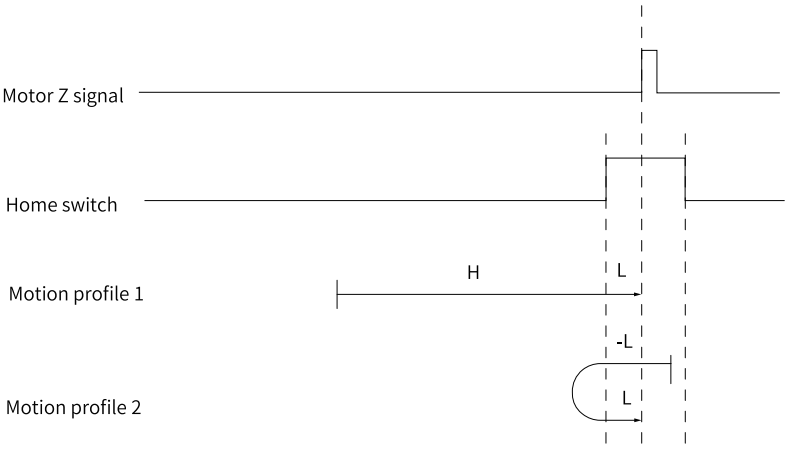


Figure 2-15 Motor running curve and speed in mode 4

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 5

Home: Z signal

Deceleration point: home switch (HW)

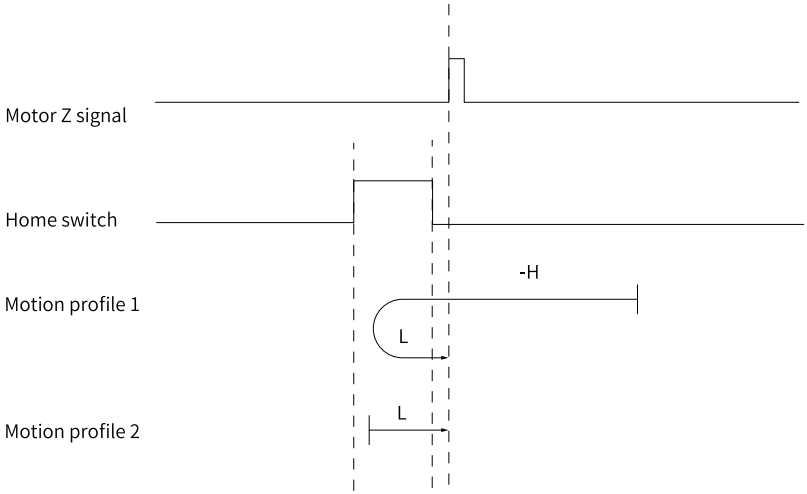


Figure 2-16 Motor running curve and speed in mode 5

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 6

Home: Z signal

Deceleration point: home switch (HW)

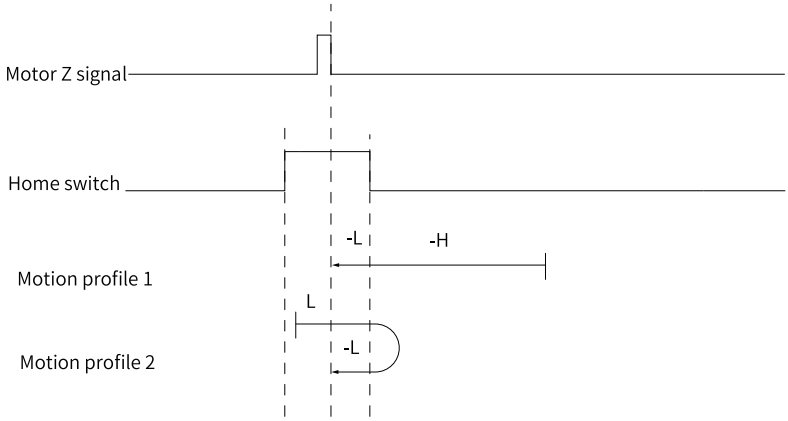


Figure 2-17 Motor running curve and speed in mode 6

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 7

Home: Z signal

Deceleration point: home switch (HW)

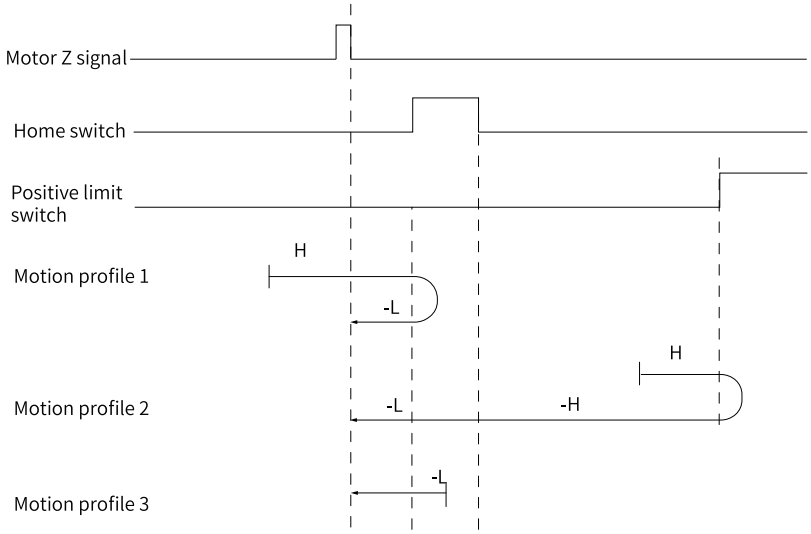


Figure 2-18 Motor running curve and speed in mode 7

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.

- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 8

Home: Z signal

Deceleration point: home switch (HW)

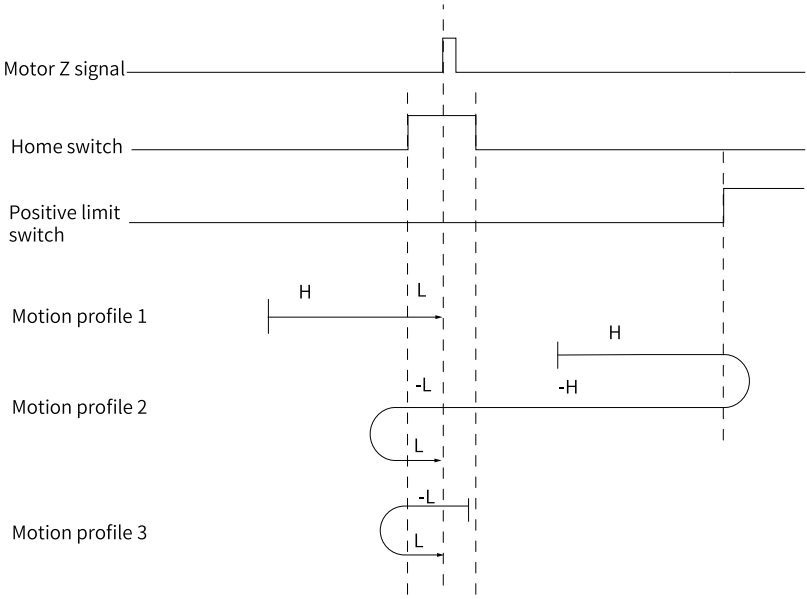


Figure 2-19 Motor running curve and speed in mode 8

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 9

Home: Z signal

Deceleration point: home switch (HW)

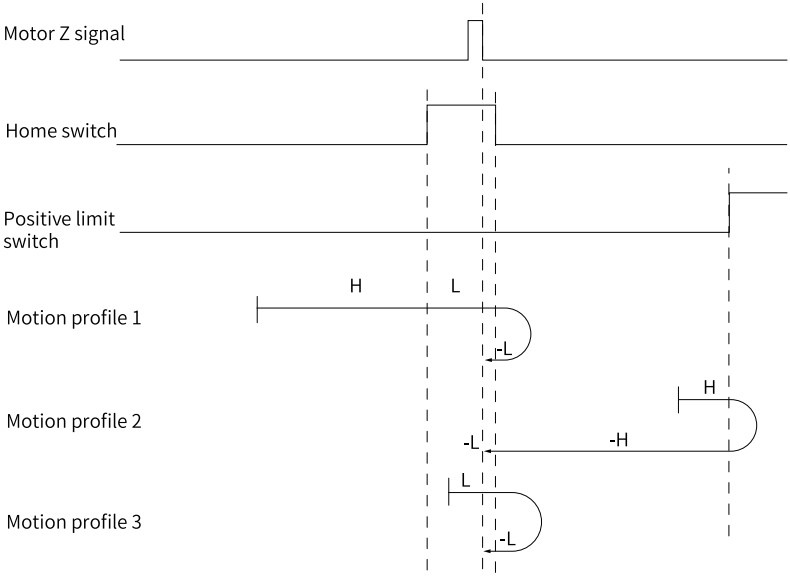


Figure 2-20 Motor running curve and speed in mode 9

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 10

Home: Z signal

Deceleration point: home switch (HW)

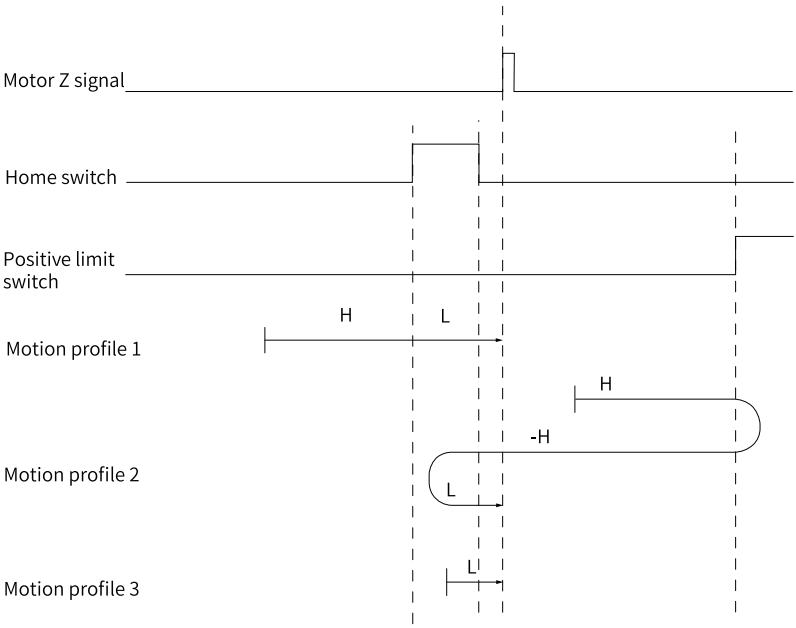


Figure 2-21 Motor running curve and speed in mode 10

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 11

Home: Z signal

Deceleration point: home switch (HW)

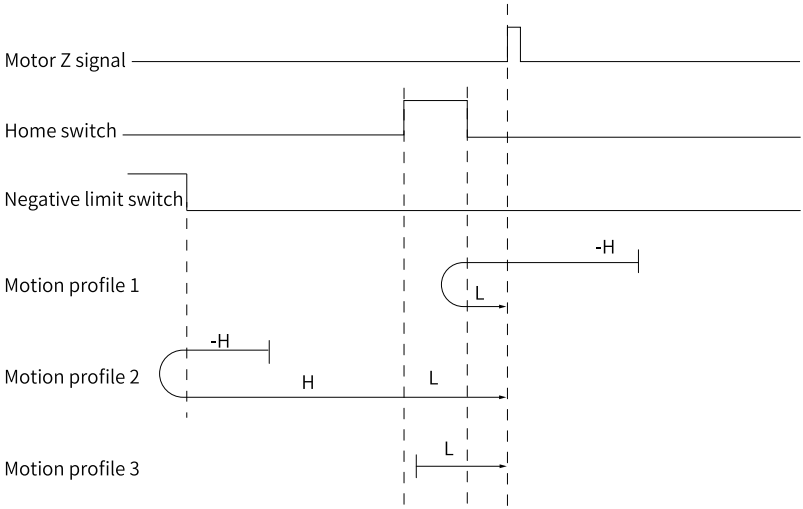


Figure 2-22 Motor running curve and speed in mode 11

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 12

Home: Z signal

Deceleration point: home switch (HW)

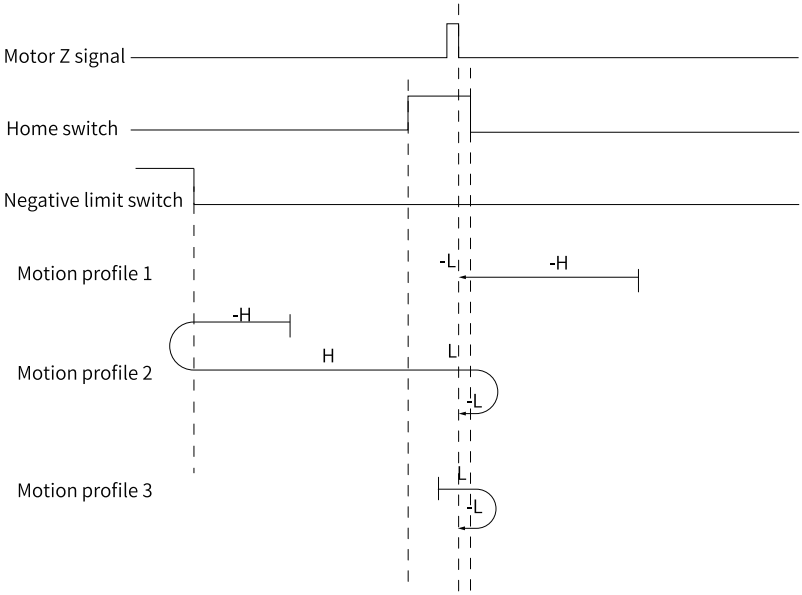


Figure 2-23 Motor running curve and speed in mode 12

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 13

Home: Z signal

Deceleration point: home switch (HW)

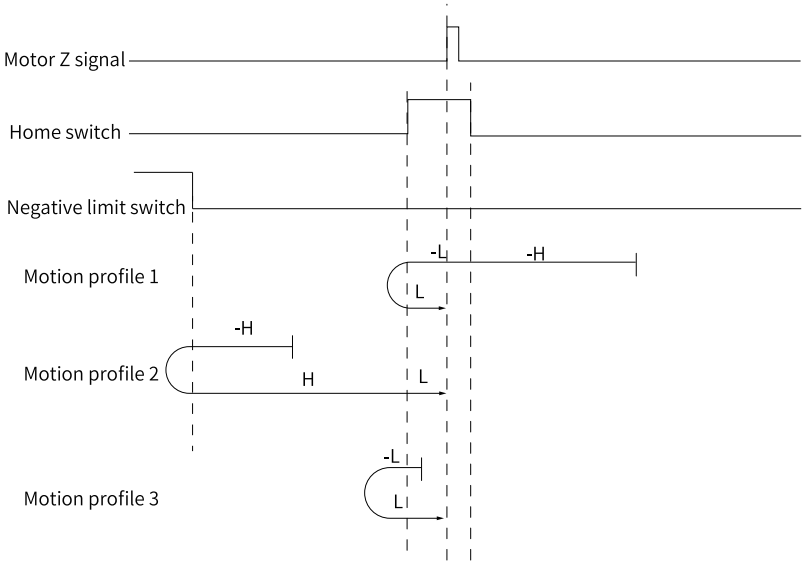


Figure 2-24 Motor running curve and speed in mode 13

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 14

Home: Z signal

Deceleration point: home switch (HW)

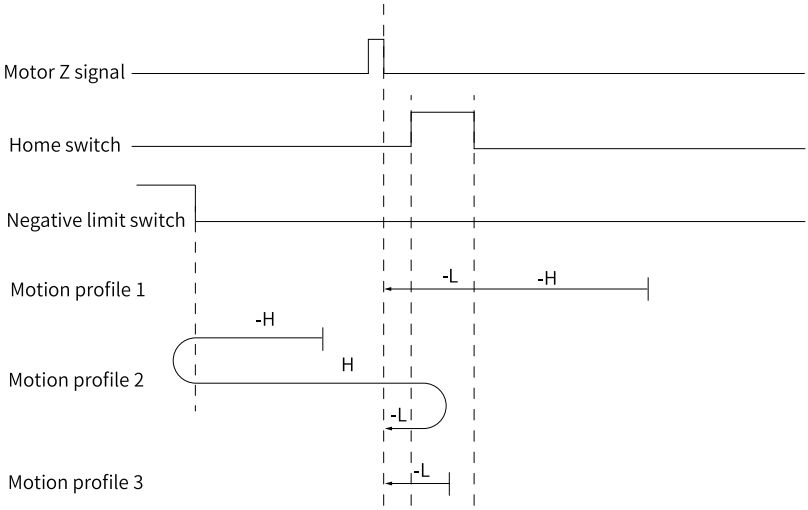


Figure 2-25 Motor running curve and speed in mode 14

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 17

Home: negative limit switch

Deceleration point: negative limit switch

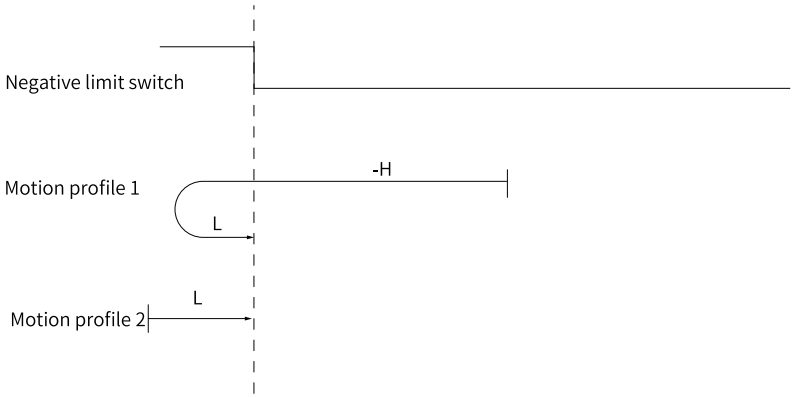


Figure 2-26 Motor running curve and speed in mode 17

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.

- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 18

Home: positive limit switch

Deceleration point: positive limit switch

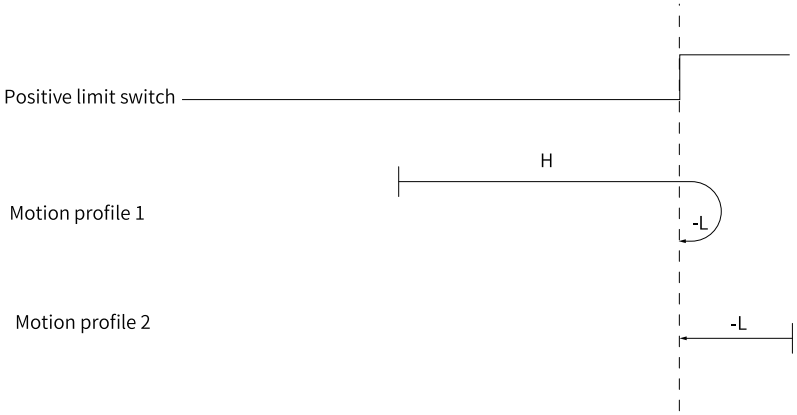


Figure 2-27 Motor running curve and speed in mode 18

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 19

Home: home switch (HW)

Deceleration point: home switch (HW)

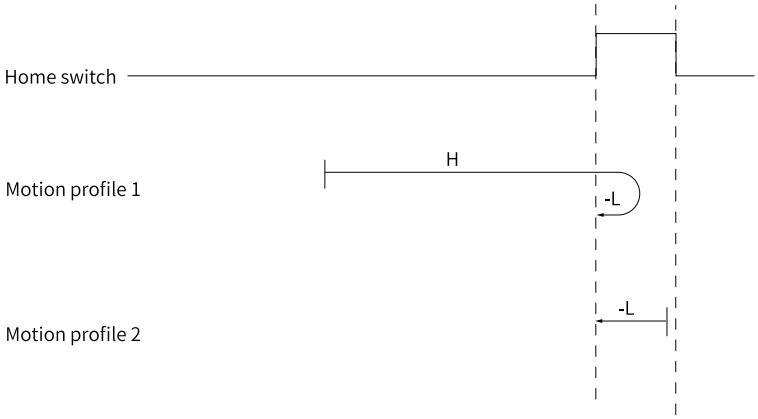


Figure 2-28 Motor running curve and speed in mode 19

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.

- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 20

Home: home switch (HW)

Deceleration point: home switch (HW)

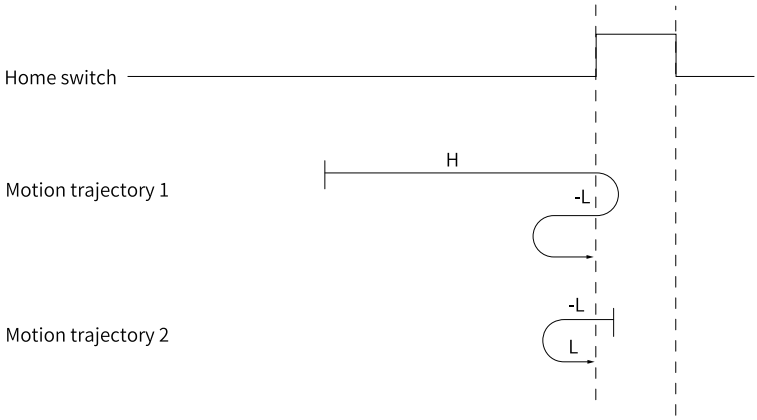


Figure 2-29 Motor running curve and speed in mode 20

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 21

Home: home switch (HW)

Deceleration point: home switch (HW)

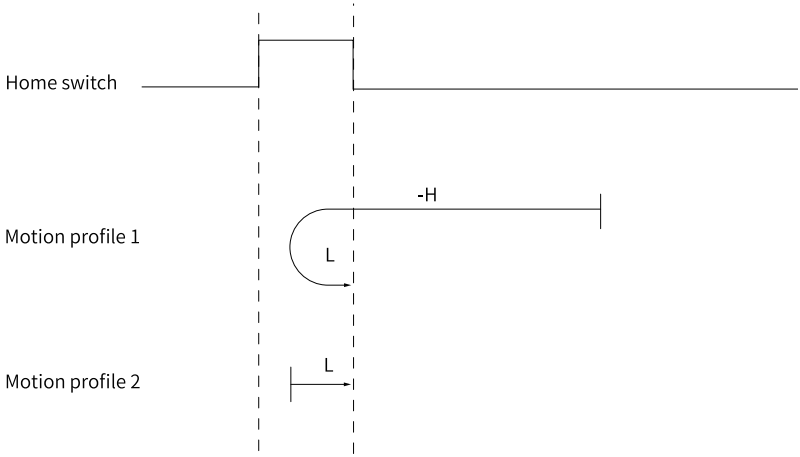


Figure 2-30 Motor running curve and speed in mode 21

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 22

Home: home switch (HW)

Deceleration point: home switch (HW)

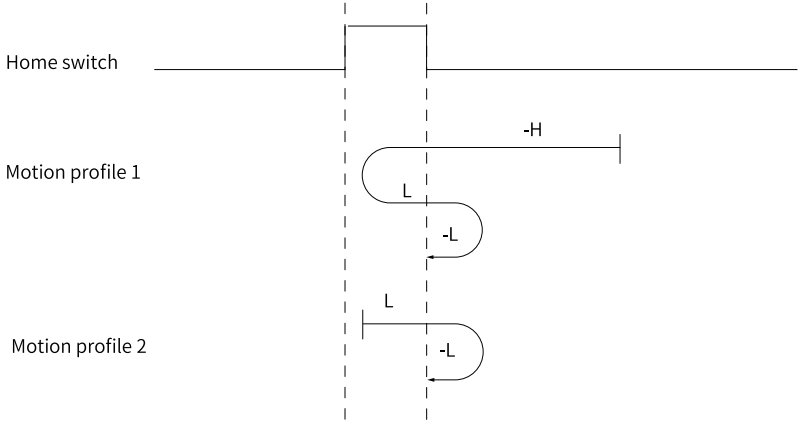


Figure 2-31 Motor running curve and speed in mode 22

- Motion profile 1: Deceleration point signal inactive at startup in homing mode.
- Motion profile 2: Deceleration point signal active at startup in homing mode.

6098h = 23

Home: home switch (HW)

Deceleration point: home switch (HW)

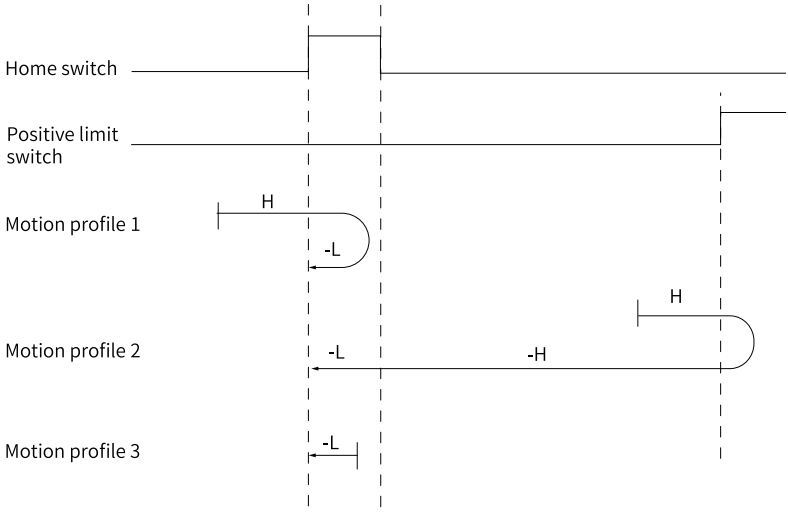


Figure 2-32 Motor running curve and speed in mode 23

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 24

Home: home switch (HW)

Deceleration point: home switch (HW)

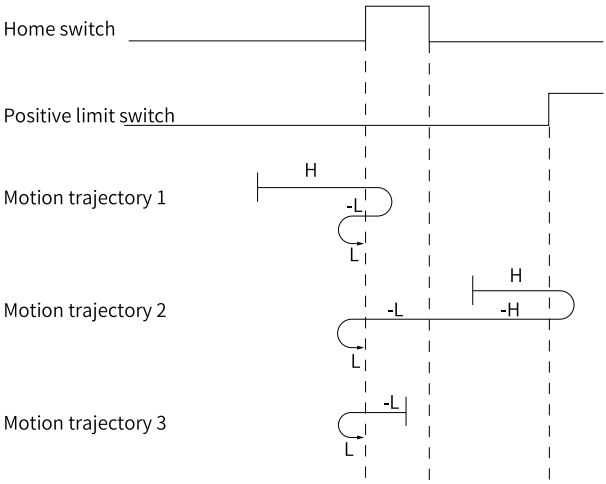


Figure 2-33 Motor running curve and speed in mode 24

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 25

Home: home switch (HW)

Deceleration point: home switch (HW)

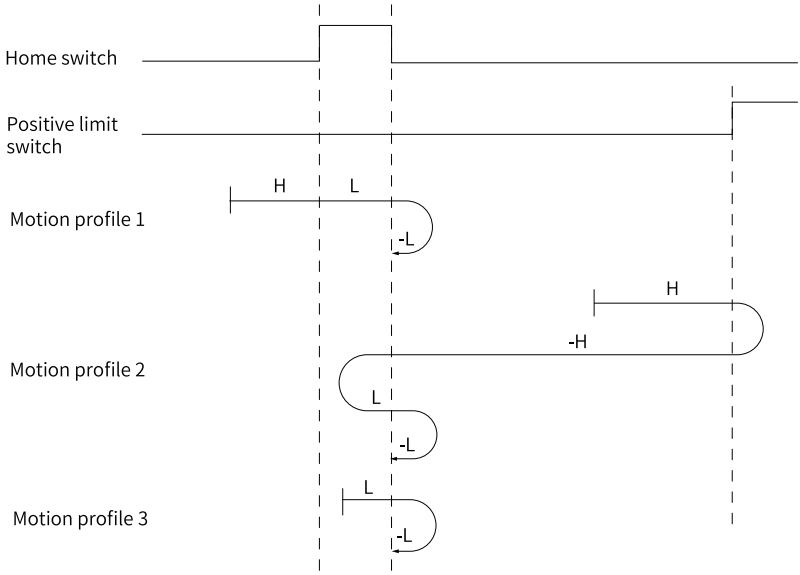


Figure 2-34 Motor running curve and speed in mode 25

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 26

Home: home switch (HW)

Deceleration point: home switch (HW)

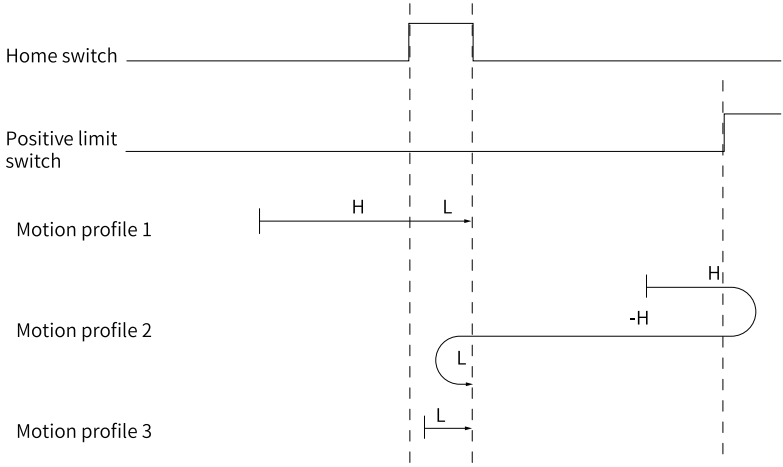


Figure 2-35 Motor running curve and speed in mode 26

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the positive limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 27

Home: home switch (HW)

Deceleration point: home switch (HW)

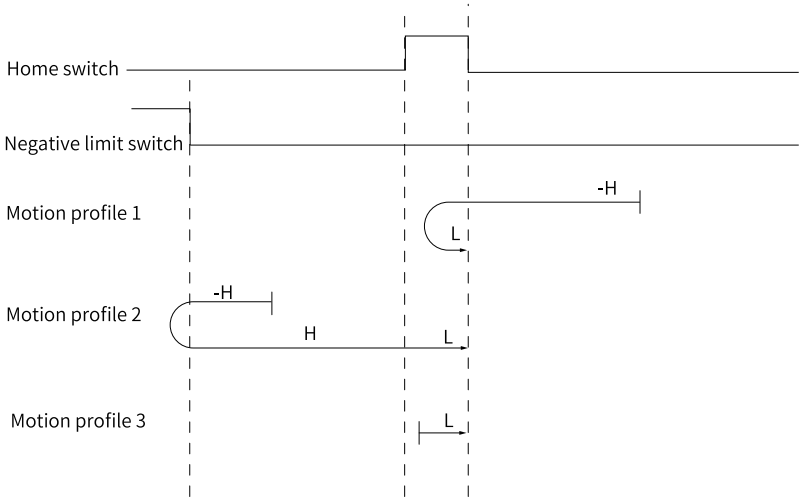


Figure 2-36 Motor running curve and speed in mode 27

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 28

Home: home switch (HW)

Deceleration point: home switch (HW)

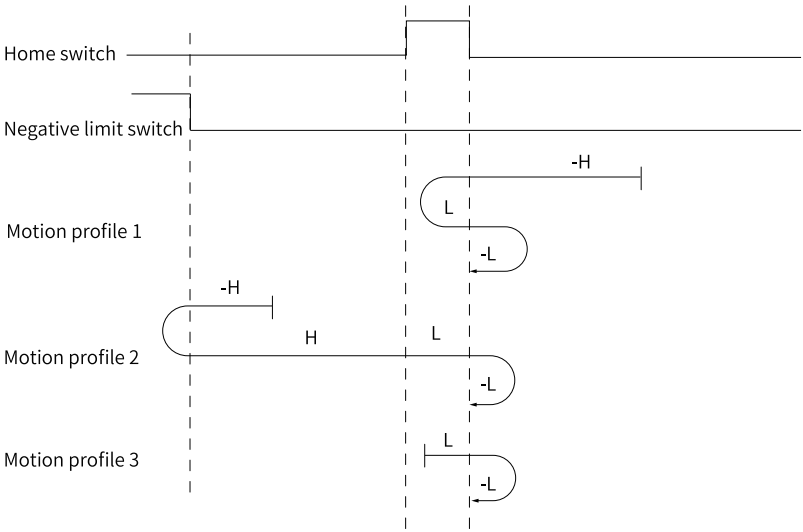


Figure 2-37 Motor running curve and speed in mode 28

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 29

Home: home switch (HW)

Deceleration point: home switch (HW)

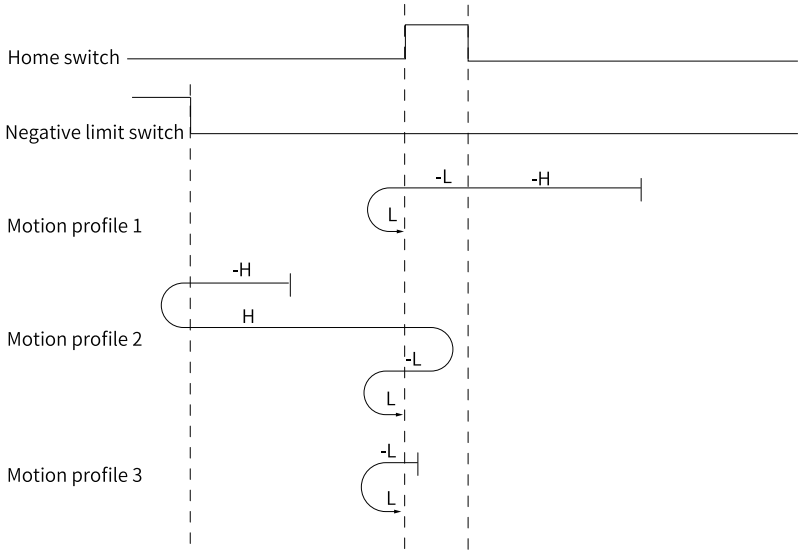


Figure 2-38 Motor running curve and speed in mode 29

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 30

Home: home switch (HW)

Deceleration point: home switch (HW)

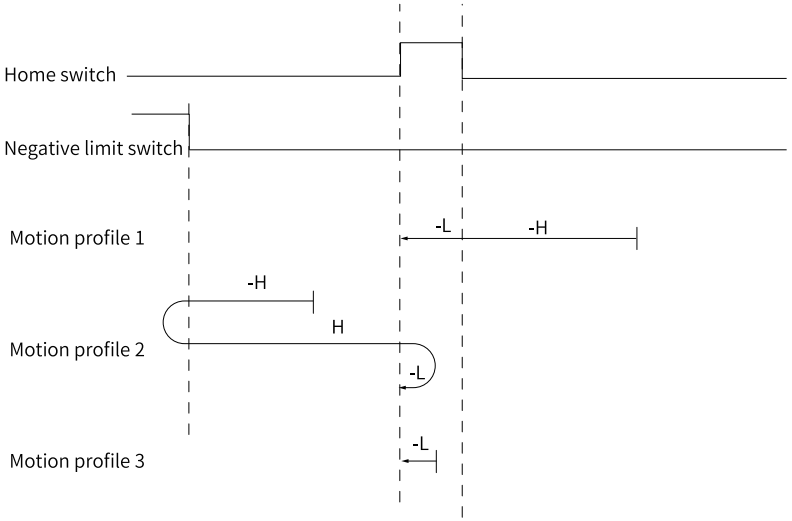


Figure 2-39 Motor running curve and speed in mode 30

- Motion profile 1: Deceleration point signal inactive at startup in homing mode, not hitting the reverse limit switch.
- Motion profile 2: HW signal inactive at startup in homing mode, hitting the reverse limit switch.
- Motion profile 3: Deceleration point signal active at startup in homing mode.

6098h = 31 and 32

This mode is not defined in the CiA402 protocol. It can be used for extension purpose.

6098h = 33/34

Home: Z signal

Deceleration point: None

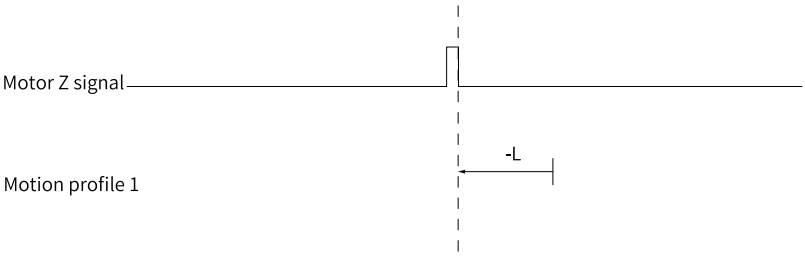


Figure 2-40 Motor running curve and speed in mode 33

- Motion profile 1: The motor runs in the reverse direction at low speed and stops at the first Z signal.

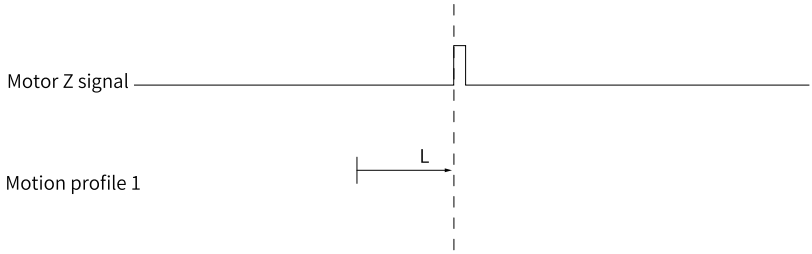


Figure 2-41 Motor running curve and speed in mode 34

- Motion profile 1: The motor runs in the forward direction at low speed and stops at the first Z signal.

6098h = 35

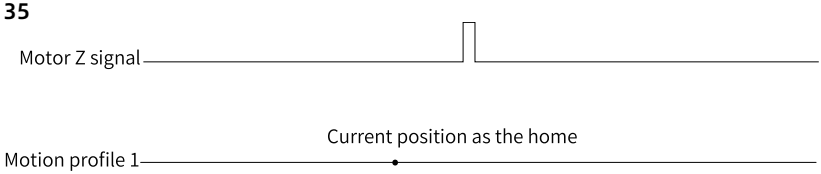


Figure 2-42 Motor running curve and speed in mode 35

Homing mode 35: The present position is taken as the mechanical home. After homing is triggered (control word 6040h: 0x0F → 0x1F),

60E6h = 0 (absolute homing):

After homing is complete, 6064h (position feedback value) is equal to the home offset 607Ch.

60E6h = 1 (relative homing):

After homing is complete, 6064h is the sum of the original value plus the home offset 607Ch.

6098h = -1

The motor runs in the reverse direction at a high speed first. If the status where the torque reaches the limit and the speed is near zero after the axis hits the mechanical limit persists, it indicates that the axis has reached the mechanical limit position. In this case, the motor runs in the forward direction at a low speed and stops after reaching the rising edge of the Z signal for the first time.

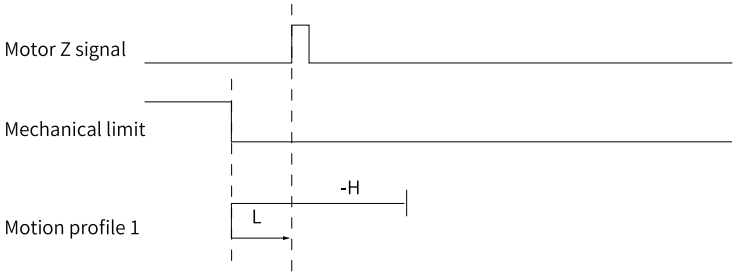


Figure 2-43 Motor running curve and speed in mode -1

6098h = -2

The servo motor runs in the forward direction at a high speed first. If the torque reaches the limit and the speed is near zero when the motor hits the mechanical limit, and such status persists, it indicates that the motor reaches the mechanical limit position. In this case, the motor runs in the reverse direction at a low speed and stops at the first Z signal after reaching the rising edge.

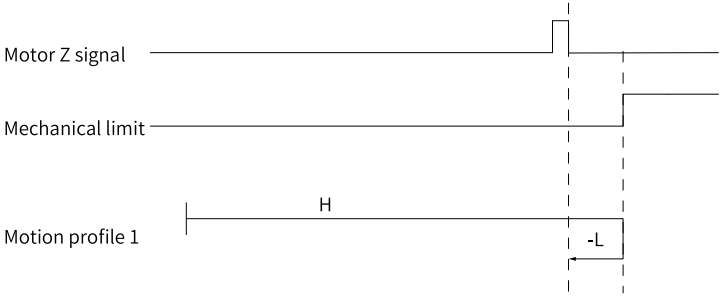


Figure 2-44 Motor running curve and speed in mode -2

6098h = -3

Home: Z signal

Deceleration point: none

- If the single-turn position is close to the reverse home, the homing profile is motion profile 1.
- If the single-turn position is close to the forward home, the homing profile is motion profile 2.

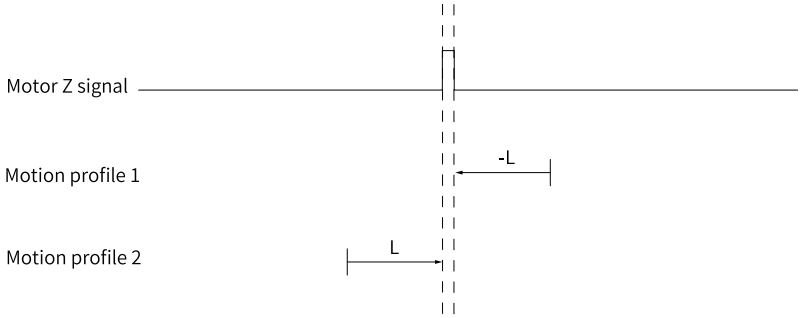


Figure 2-45 Motor running curve and speed in mode -3

- Motion profile 1: The motor runs in the reverse direction at a low speed and stops at the first Z signal.
- Motion profile 2: The motor runs in the forward direction at a low speed and stops at the first Z signal.

Evaluation condition for torque homing: After the motor reaches the hard limit, and the torque feedback reaches the limit value defined in H05.58 (torque limit, in 0.1%), the first Z signal in the reverse direction is searched for and regarded as the home after the motor stops.

3 Applicable Scenarios

3.1 Absolute System

3.1.1 Overview

The absolute encoder, which features a single-turn resolution of 8388608 (2^{23}), is used to detect the motor position within one turn and count the number of motor revolutions, with 23-bit multi-turn data recorded. The absolute system integrated with the absolute encoder works in absolute position linear mode or absolute position rotating mode. These modes apply to position control, speed control, and torque control modes. The absolute encoder with a battery can back up data when the servo drive is powered off. This enables the servo drive to calculate the absolute mechanical position upon power-on again. Therefore, the homing operation is not required.

To match the absolute encoder with the SV660ND series servo drives, set H00.00 (Motor code) to 14101 (Inovance 23-bit absolute encoder) and set H02.01 (Absolute system selection) based on actual conditions. E731.0 (Encoder battery failure) will occur upon initial power-on of the battery. Set H0d.20 (Absolute encoder reset function) to 1 to reset E731.0 before performing the homing operation.

Note

When you change the value of H02.02 (Direction of rotation) or H0d.20 (Absolute encoder reset selection), the absolute position recorded by the encoder changes suddenly, causing the mechanical absolute position reference to change. In this case, perform the homing operation. After homing is done, the deviation between the mechanical absolute position and that recorded in the encoder will be calculated automatically and saved in the EEPROM of the servo drive.

3.1.2 Related Parameters

Absolute encoder system settings

Set H00.00 to 14101 to select the Inovance motor with a 23-bit absolute encoder, and select the absolute position mode in H02.01.

See *" H00_en.00" on page 124* for details.

See *" H00_en.08" on page 125* for details.

See *" H02_en.01" on page 151* for details.

Note

In the absolute position mode, the system detects the motor code automatically to check whether the motor used is configured with an absolute encoder. If not, E122.0 (Product mismatch in the absolute position mode) occurs.

Encoder feedback data

The encoder feedback data is divided into the number of revolutions and the single-turn position. For the incremental position mode, the number of revolutions is not recorded.

See *" H0b_en.70" on page 265* for details.

See *" H0b_en.71" on page 265* for details.

See *" H0b_en.77" on page 266* for details.

See *" H0b_en.79" on page 266* for details.

Absolute position linear mode

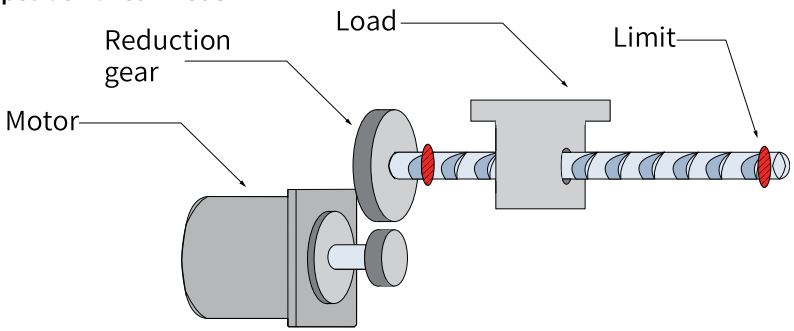


Figure 3-1 Application of the linear mode

Assume that the absolute mechanical position (H0b.58 and H0b.60) is P_M, the encoder absolute position is P_E, and the position offset in the absolute position linear mode is P_O. In this case, their relationship is: $P_M = P_E - P_O$.

If the electronic gear ratio is B/A, then the following formula applies: H0b.07 (Absolute position counter) = P_M /(B/A) H0b.07 indicates present mechanical absolute position (in reference unit).

The multi-turn data range in the absolute position linear mode is -32768 to +32767. If the number of forward revolutions is higher than 32767 or the number of reverse revolutions is lower than -32768, E735.0 (Encoder multi-turn counting overflow) occurs. In this case, set H0d.20 to 2 (Reset multi-turn data), and then perform homing again. In special occasions, you can set H0A.36 to 1 to hide E735.0 or use absolute position linear mode 2.

See *" H05_en.36" on page 182* for details.

See *" H0b_en.07" on page 253* for details.

See *" H0b_en.58" on page 263* for details.

See *" H0b_en.60" on page 264* for details.

Absolute position rotation mode

This mode applies in cases where the load travel range is unlimited and the number of unidirectional revolutions is lower than 32767 upon power failure, as shown in the following figure.

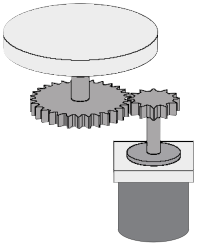
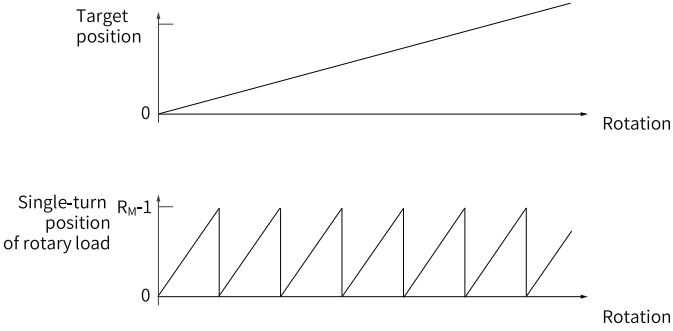
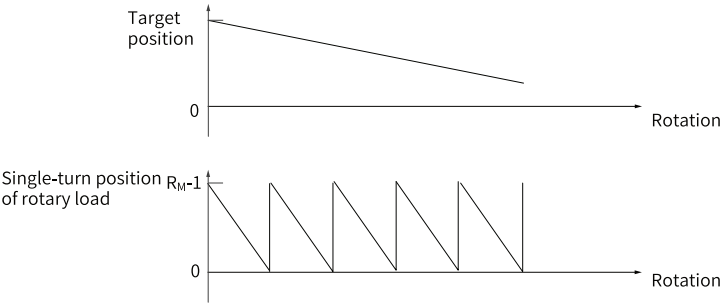


Figure 3-2 Application of the linear mode

The single-turn position range of the rotary load is 0 to (RM - 1) (RM: Encoder pulses per load revolution). When the gear ratio is 1:1, the variation law of the target position and the single-turn position of the rotary load during forward operation is shown as follows.



The variation law of the target position and the single-turn position of the rotary load during reverse operation is shown as follows.



When the motor operates in absolute rotation mode and the drive operates in HM mode, the setting range of the home offset is 0 to (R_M - 1). If the home offset is set to a value outside this range, the drive reports EE09.1 (Home setting error).

The multi-turn data range is unlimited in absolute position rotation mode. Therefore, E735.0 (Encoder multi-turn counting overflow) is hidden automatically.

Related parameters

See *" H05_en.50" on page 182* for details.

See *" H05_en.51" on page 183* for details.

See *" H05_en.52" on page 183* for details.

See *" H05_en.54" on page 183* for details.

See *" H0b_en.81" on page 266* for details.

See *" H0b_en.83" on page 266* for details.

See *" H0b_en.85" on page 267* for details.

Single-turn absolute mode

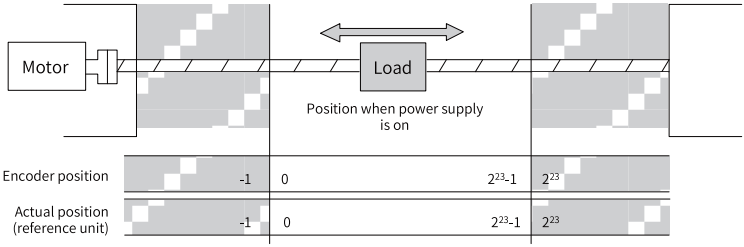
This mode applies to applications where the load travel range is within the single-turn range of the encoder. In this case, the absolute encoder needs no battery as it records the single-turn data only.

- Target position input range
  If a 26-bit absolute encoder is used in the single-turn absolute mode, the drive operates in the position control mode and the electronic gear ratio is 1:1, then:

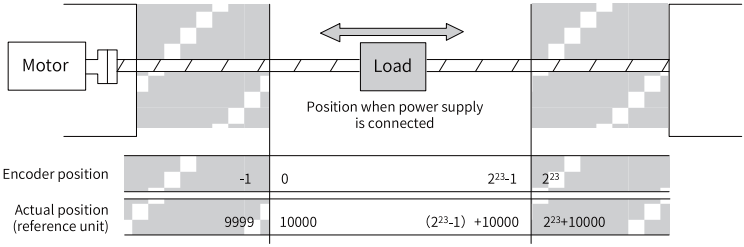
  When H05.36 (Mechanical home offset) is set to 0, the target position range is 0 to (2^{23} - 1).

  After homing is completed, the target position range is H05.36 to (2^{23} - 1 + H05.36).

- Example
  When the gear ratio is 1:1 and H05.36 is set to 0:



When the gear ratio is 1:1 and H05.36 is set to 10000:



3.1.3 Precautions

E731.0 (Encoder battery failure) will occur at initial power-on of the battery. Set H0d.20 (Absolute encoder reset function) to 1 to reset E731.0 before further operations.

When the battery voltage detected is lower than 3.0 V, E730.0 (Encoder battery warning) occurs.

In this case, replace the battery according to the following steps.

1. Power on the servo drive and make it remain in the non-operational state.
2. Replace the battery.
3. After the servo drive automatically resets E730.0, if no other alarm occurs, continue to operate the servo drive.

Note

- If you replace the battery after powering off the servo drive, E731.0 (Encoder battery failure) will occur at next power-on, leading to an abrupt change in the multi-turn data. In this case, set H0d.20 to 1 to reset the encoder fault. Then perform the homing operation again.
- Ensure the maximum motor speed does not exceed 6000 rpm upon power-down of the servo drive. This is to enable the encoder to record the position accurately.
- Keep the battery in environments within the required ambient temperature range and ensure the battery is in reliable contact and carries sufficient power capacity. Otherwise, encoder data loss may occur.

For details, see *" H0d_en.20" on page 273*.

Note

The absolute position recorded by the encoder changes abruptly after multi-turn data reset. In this case, perform mechanical homing.

3.2 Software position limit

Function description

Hardware position limit is implemented by inputting external encoder signals to CN1 of the servo drive.

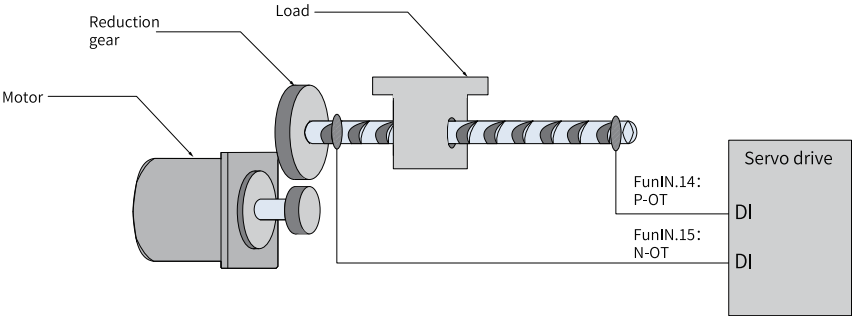


Figure 3-3 Installation of limit switches

Software position limit is implemented through a comparison between the internal position feedback and the specified limit value. If the specified limit value is exceeded, the servo drive reports a warning and stops immediately. Software position limit is available both in absolute position mode and incremental position mode. To use the software position limit in incremental position mode, set H0A.01 (Software position limit) to 2 (Enabled after homing) first, and then perform homing upon power-on before applying software position limit.

Table 3–1 Comparison between the hardware position limit and software position limit

Hardware Position Limit		Software position limit	
1	Restricted to linear motion and single-turn rotational motion.	1	Applicable to both the linear motion and the rotational motion.
2	Requires an external mechanical limit switch.	2	Hardware wiring is not required, preventing malfunction due to poor cable connection.

Hardware Position Limit		Software position limit	
3	Suffered from the risk of mechanical slip.	3	Internal position comparison can prevent malfunction due to mechanical slip.
4	Unable to sense or detect an overtravel fault after power-off.		

Related objects

☆Related parameters:

For details, see *" H0A_en.01" on page 236*.

For details, see *" H0A_en.41" on page 241*.

For details, see *" H0A_en.43" on page 241*.

- When H0A.01 is set to 0, software position limit is disabled.
- When H0A.01 is set to 1, software position limit is enabled immediately upon power-on. 607D.01h and 607D.02h are used by the function. Ensure the value of 607D.01h is lower than or equal to 607D.02h. If 607D.01h is set to a value larger than 607D.02h, EE09.0 (Software position limit setting error) will occur.
- If H0A.01 is set to 2, software position limit is not enabled after homing upon power-on. When the value of the absolute position counter is larger than the value of 607D.02h after homing, E950.0 (Forward overtravel warning) occurs and the drive stops accordingly. When the value of the absolute position counter is smaller than the value of 607D.01h after homing, E952.0 (Reverse overtravel warning) occurs and the drive stops accordingly.

Note

Ensure the value of 607Ch (Home offset) is within the software position limit. Otherwise, the servo drive reports EE09.1.

3.3 Position Comparison

Function description

Position comparison works by comparing the instantaneous position feedback with the value pre-saved in the data array and, once available, outputting a DO signal with pulse width settable. Position comparison is applicable to high-speed motion axes as comparison actions are implemented by FPGA, removing the risk of software communication delay between processors.

Note

During position comparison, the position comparison function is executed again when any of the comparison start point, stop point, and comparison mode are modified.

The following table describes the specifications of position comparison output.

Specifications of position comparison output		Function description
Trigger output	Output terminal	4 DOs or frequency-division output ABZ/OCZ signals.
	Logic	The effective level of DO is defined by the DO logic in group H04.
	Pulse width	The pulse output width is defined by H18.05.
	Delay compensation	Defined by H18.14 and used to compensate for hardware output delay.
Comparison source	Motor encoder feedback	Supported
Comparison value	Number of comparison points	40 points, signed 32-bit integer
Comparison attribute	Attribute of comparison point	Defines the attribute of the comparison point.
		Defines the output terminal for comparison.

Related objects

When the position comparison output function is enabled, you can configure position comparison output on, for example, axis 1 (configured as 125) or axis 2 (configured as 225). Both axes cannot be configured as position comparison output at the same time. Otherwise, the alarm E902.1 will be triggered.

Position comparison output parameters:

Parameter code	Parameter name	Description
H18: Position comparison output		
H18.00	Position comparison switch	1: Enable
H18.01	Position comparison output feedback source	0: Motor encoder feedback

Parameter code	Parameter name	Description
H18: Position comparison output		
H18.02	Position comparison resolution[1]	Defines the number of pulses per revolution. For example, if H18.02 is set to 1, the number of pulses per revolution is 2^{23}. 0: 24bit 1: 23bit 2: 22bit 3: 21bit 4: 20-bit 5: 19bit 6: 18bit 7: 17bit
H18.03	Position comparison mode	0: Individual comparison 1: Cyclic comparison 2: Fixed cyclic comparison
H18.04	Current position as zero	1: Enable (rising edge-triggered) Note: This function needs to be used when the comparison state is inactive. Otherwise, the comparison logic may malfunction.
H18.05	Position comparison pulse output width	Defines the active pulse width of the DO when the comparison point is reached. The value range is 0.1 to 204.7 (in ms).
H18.07	Start point of position comparison	Activated when H18.00 is set to 1 again.
H18.08	End point of position comparison	Activated when H18.00 is set to 1 again.
H18.09	Current state of position comparison	0: No comparison; n: Waiting for the comparison point N
H18.10	Real-time position of position comparison	The DO configuration clears the position comparison real-time position when performing axis switch.
H18.12	Zero offset of position comparison	Defines the offset value after current position is taken as the zero point. Value range: -2^{31} to $+2^{31}$ - 1
H18.14	Position comparison output delay compensation	Comparison delay compensation time: -12 us to +12 us
H18.15	Fixed cyclic comparison	1 to 65535
H18.17	Number of fixed mode cycles	Range: 1 to 65535

Parameter code	Parameter name	Description
H19: Target position parameters		
H19.00	Target value of position comparison 1	Defines the target value of position comparison 1. Value range: -2^{31} to 2^{31} - 1
H19.02	Attribute value of position comparison 1	Defines the attribute value of position comparison 1. bit0: 1: Output DO active signal if current position changes from "less than" to "more than" the comparison point; 0: Skip this point bit1: 1: Output DO active signal if current position changes from "more than" to "less than" the comparison point; 0: Skip this point bit2 to bit6: NA bit7: DO1 bit8: DO2 bit9: DO3 bit10: DO4 Bit11: N/A
H19.03	Target value of position comparison 2	Defines the target value of position comparison 2. Value range: -2^{31} to 2^{31} - 1
H19.05	Attribute value of position comparison 2	Defines the attribute value of position comparison 2. Value range: Same as above
...	...	...
H19.117	Target value of position comparison 40	Defines the target value of position comparison 40. Value range: -2^{31} to 2^{31} - 1
H19.119	Attribute value of position comparison 40	Defines the attribute value of position comparison 40. Value range: Same as above

Function operation

1. How it works

   Position comparison works by comparing the instantaneous position feedback with the value pre-saved in the data array and, once available, outputting a DO signal with pulse width settable for future use in subsequent motion control. Position comparison is applicable to high-speed motion axes as comparison actions are implemented by FPGA, removing the risk of software communication delay between processors.

   - Position comparison switch

     When the value of H18.00 (Position comparison switch) changes from 0 to 1, position comparison starts and the value of H18.09 (Current state of position comparison) is updated to the start point of position comparison. When the value of H18.00 changes to 0, position comparison stops and the current comparison state will be cleared.

- Position comparison resolution
  The comparison resolution defines the number of pulses per revolution. Given the maximum and minimum limits on the target position (defined by group H19), you can reset the resolution when data overflow occurs on the comparison value. For example, when H18.02 is set to 7, the maximum value of the target position is 2^{31} - 1, and the motor rotates (2^{31} - 1)/2^{17} turns.

Note

The target position in group H19 is only related to the set resolution.

- Individual comparison mode
  In individual comparison mode, when comparison of the end point is completed, the comparison function is automatically switched off and the current comparison value is cleared. Position comparison can be enabled again only when the position comparison switch is switched on again.

  The real-time position feedback in individual comparison mode is an absolute value, which means it is an accumulative value based on preceding comparison points and cannot be automatically cleared.

- Cyclic comparison mode
  In cyclic comparison mode, position comparison will not be switched off when the comparison end point is reached, and current position comparison value will be reset as the start point for position comparison. After comparison of each point is completed, the real-time position feedback (H18.10) will be cleared and counted again for cyclic comparison. In cyclic comparison mode, the target position is a relative (incremental) value. Each time a comparison point is reached, the real-time position feedback is cleared and counted again for comparison with the new target.

- Fixed cyclic comparison
  In fixed cyclic comparison mode, the comparison process works in the same way as the cyclic comparison mode. The number of cycles is defined by H18.15. After the set number of cycles are done executing, comparison will be automatically disabled.

- Position comparison output width
  When the position comparison conditions are fulfilled, the servo drive outputs DO active level signal. The width of the active signal can be set in H18.05 (value range: 1 to 2047 x 0.1 ms). 1 to 2047 × 0.1 ms.

  When position comparison DO is active, the comparison logic is suspended and no comparison will be performed. In this case, ensure that the operating time between two target points is larger than the output width of DO.

- Target value of position comparison
  There are 40 target values for position comparison. The target value and attribute value of position comparison must be updated to parameters in group H19 in advance.

Note

Set the target position properly. overflow comparison (H18.10) is not supported in the position comparison mode.

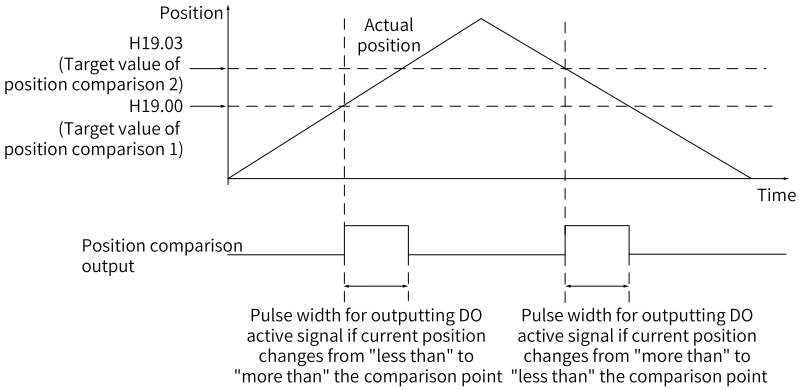
- Start point for comparison
  The start point indicates the position of the first comparison point. For example, if the start point is set to 5, the comparison starts from position comparison 5.
- End point for comparison
  The end point indicates the position of the last comparison point. For example, if the end point is set to 7, the comparison stops or restarts from the start point after position comparison 7 is reached.
- Zero offset of position comparison
  The value of H18.10 (Real-time position feedback) will be changed to the offset value defined by H18.12 (Zero offset of position comparison) at the rising edge (0 → 1) of H18.04 (Present position as zero).

Note

Check whether zero offset needs to be set before enabling position comparison output. Otherwise, comparison error may occur.

2. Function operation

- When the position feedback of the encoder passes the target position comparison points, the output width of the output terminal is defined by H18.05 (Position comparison output width).

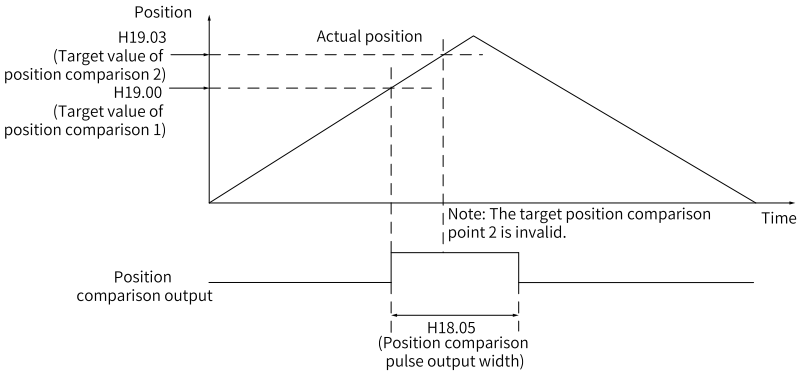


When the attribute of the comparison point is set to "bit0 = 1" (Output DO active signal if current position changes from "less than" to "more than" the comparison point), the DO outputs the position comparison signal when the axis passes the target position comparison point with position changing from "less than" to "more than" the comparison point position.

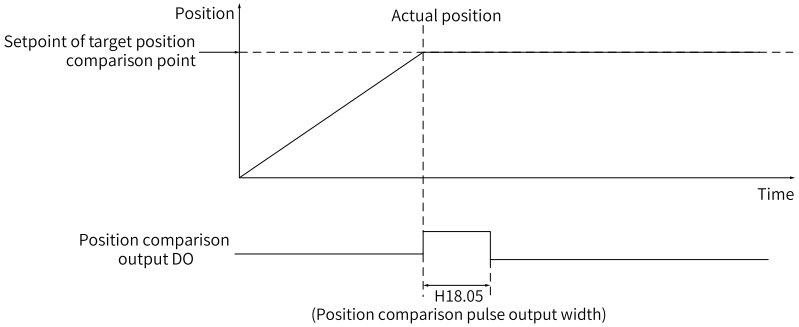
When the attribute of the comparison point is set to "bit1 = 1" (Output DO active signal if current position changing from "more than" to "less than" the comparison point), the DO outputs the position comparison signal when the axis passes the target position comparison point with position changing from "more than" to "less than" the comparison point position.

When the attribute of the comparison point is set to "bit0/bit1 = 1" (Output DO active signal in both situations), the DO outputs the position comparison signal when the position feedback passes the target position comparison point.

- When multiple position comparison values are set, no comparison will be performed once the position comparison output terminal is active. Therefore, ensure the operating time between two position comparison points is larger than the pulse output width.
  As shown in the following figure, comparison is not performed when the position changing from "more than" to "less than" the comparison point position. This is because the operating time between the two comparison points is lower than the pulse output width.



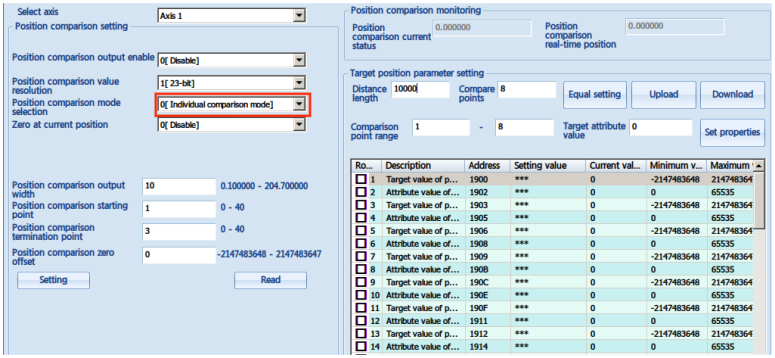
- Only one pulse will be outputted when the stop position is the same with the target value of position comparison, as shown below.



3. Interface of the software tool

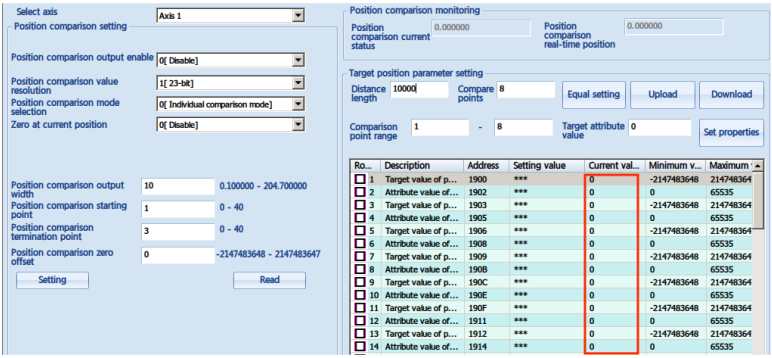
- Individual comparison mode

  a. Set H18.03 (Position comparison mode) to 0 (Individual position comparison).



b. Target position parameter setting: Set Distance length (total operating distance) and Compare points.

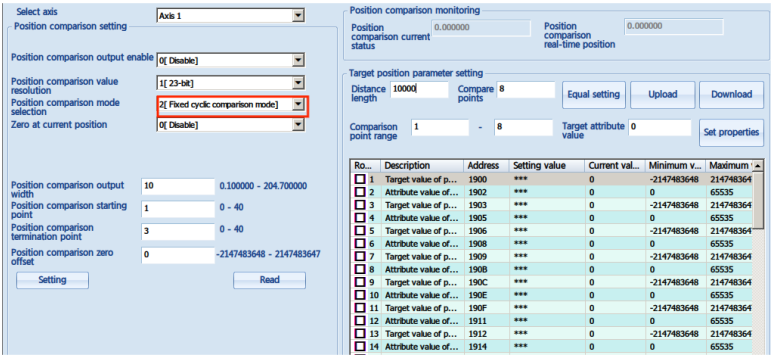
c. After you click **Equal setting**, the target value of the first point is updated to "**Distance length** x 1/**Compare points**", the target value of the second point is updated to "**Distance length** x 2/**Compare points**", and the target value of the Nth point is updated to: **Distance** x N/**Compare points**



When H18.00 (Position comparison output selection) changes from 0 to 1 (Enable (rising edge-triggered)), H18.09 (Current state of position comparison) changes from 0 to 1 and the first target position value will be compared. When H18.10 (Real-time position feedback) reaches the value of the first target position, H18.09 changes from 1 to 2, and so on.

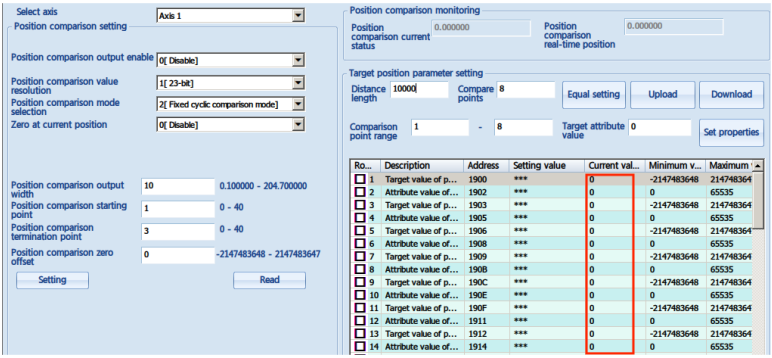
- Cyclic comparison mode/Fixed cyclic comparison mode

a. Set **Position comparison mode selection** to 1 (Cyclic comparison mode) or 2 (Fixed cyclic comparison mode).



b. **Target position parameter setting**: Set **Distance length** (distance between two adjacent points) and **Compare points** (points to be compared cyclically)

c. After clicking **Equal setting**, the target values of the 1st point to the Nth point are updated to equal interval distance values.



When H18.00 (Position comparison output selection) changes from 0 to 1 (Enable (rising edge-triggered)), H18.09 (Current state of position comparison) changes from 0 to 1 and the first target position value will be compared. When H18.10 (Real-time position feedback) reaches the value of the first target position, H18.09 changes from 1 to 2, and so on.

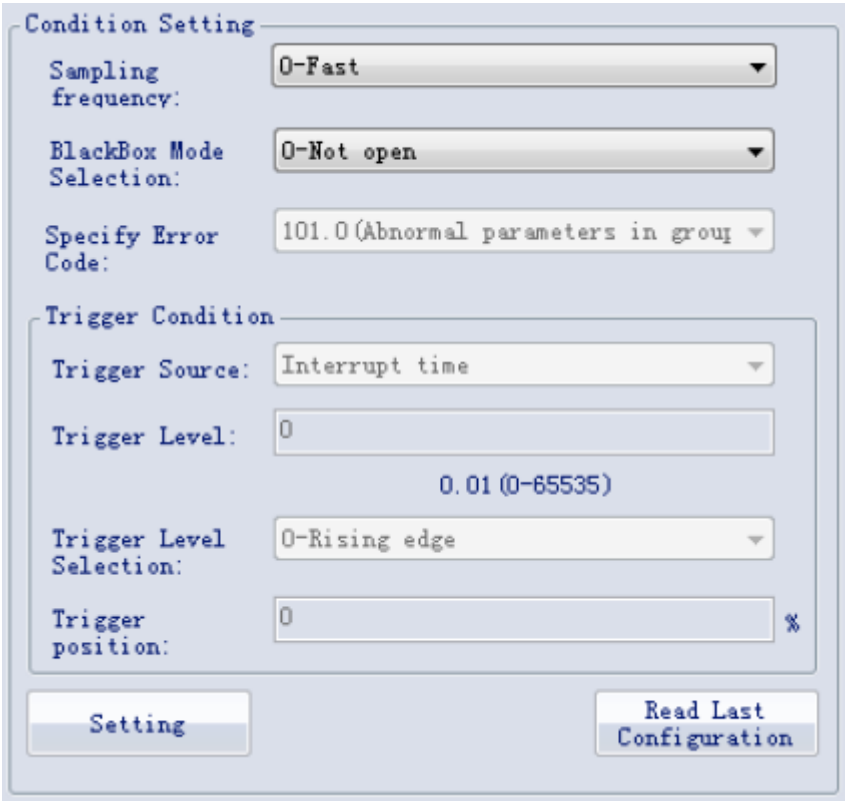
3.4 Black Box

Function description

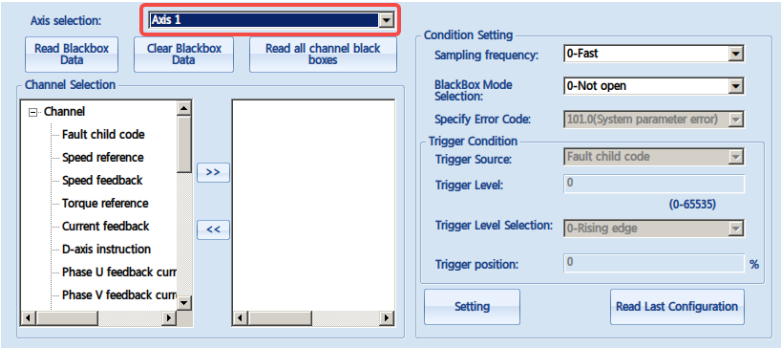
The black box function is used to capture and save the data generated upon occurrence of faults or under designated conditions. Such data can be read and uploaded by users through the software tool to facilitate troubleshooting.

The black box is enabled by default for SV660ND series servo drives. It is triggered upon occurrence of a fault or a sampling frequency of 8k. The black box function will be automatically turned off after it is being triggered, and automatically turned on upon fault reset or power cycling.

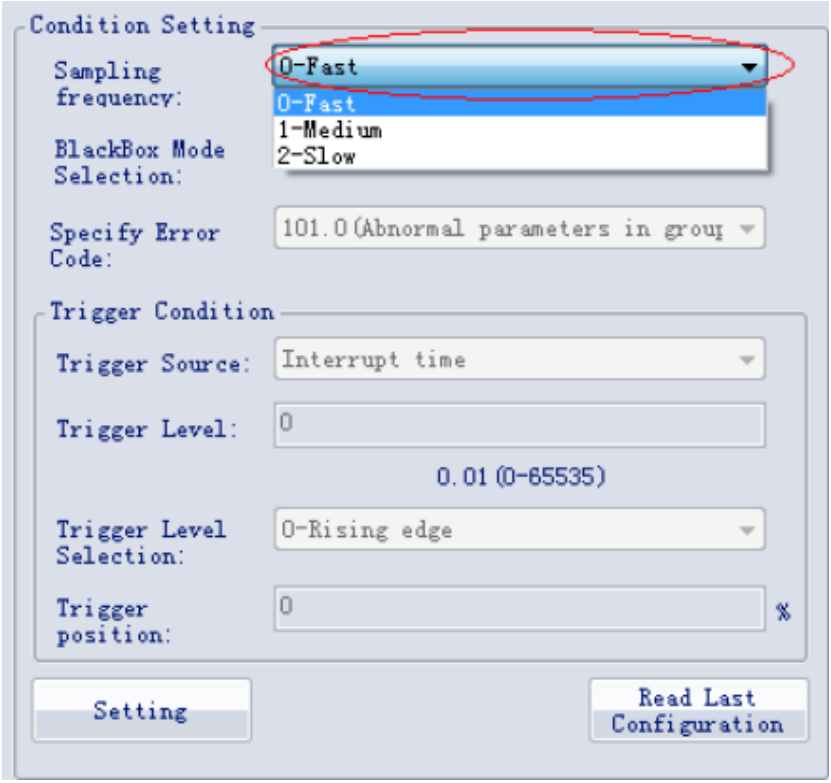
Triggering the black box



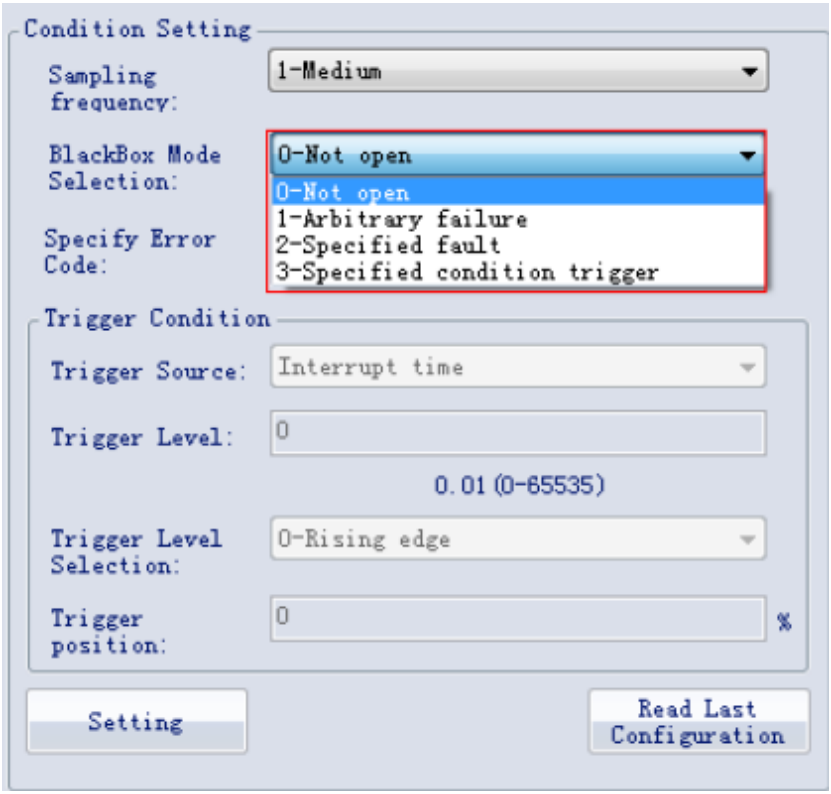
1. Axis selection: Axis 1 and Axis 2.



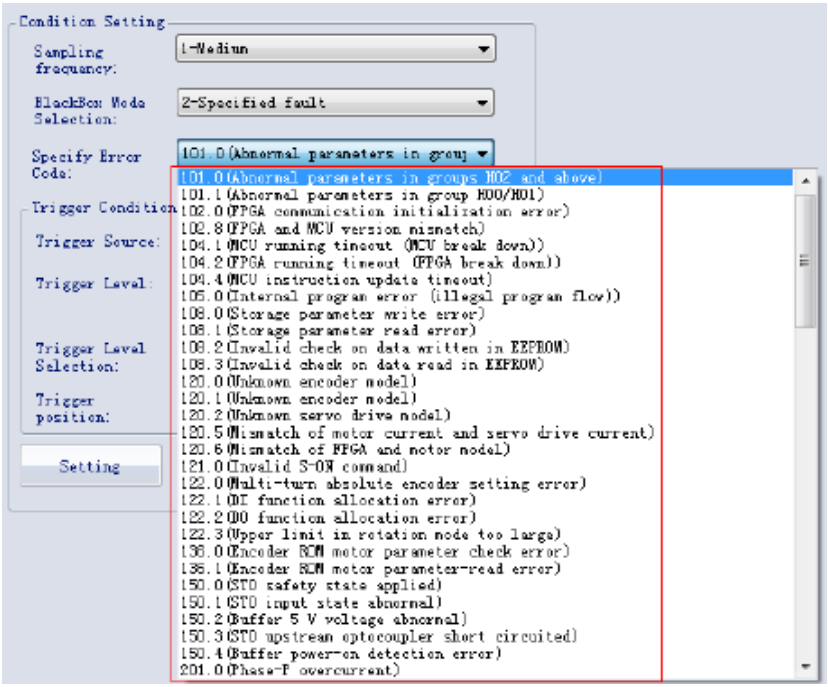
2. Sampling frequency: including three sampling frequencies, namely 8k (Fast), 4k (Medium), and 1k (Slow).



3. Black box mode selection: including three modes, namely Arbitrary fault, Specified fault, and Triggered based on designated condition.



4. Select designated fault in the combo box, as shown below.



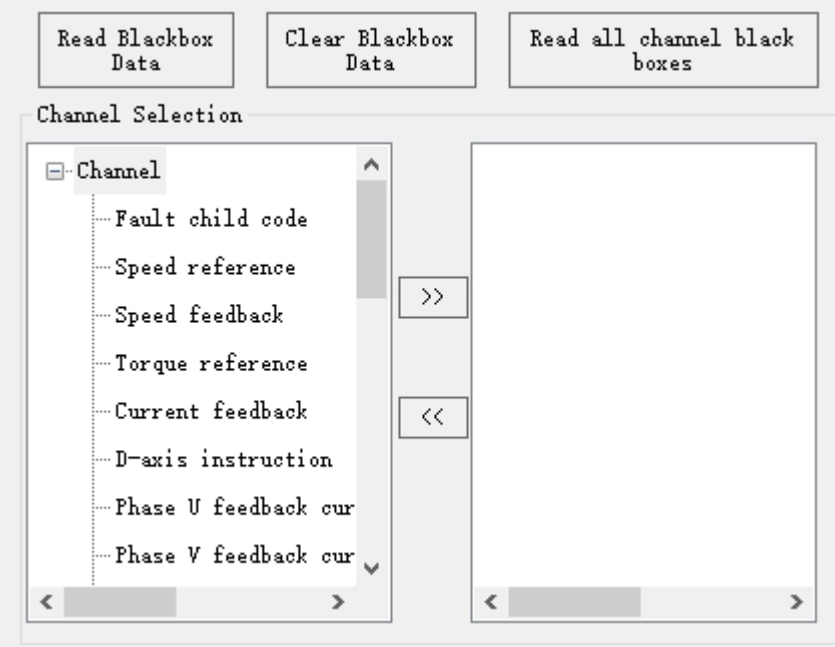
5. The Trigger Condition includes Trigger Source, Trigger Level, and Trigger Level Selection, as shown below.



6. Trigger position: used to set the position of the trigger time in the total sampling time, which is set to 75% by default.
7. After the black box is set, click **Setting** to download configuration parameters to the servo drive.

Reading black box data

You can select the black box channels (4 channels at most) by clicking **>>** or **<<**, or read data of all the channels by clicking **Read all**, then click **Save** to save the waveform files.



3.5 Touch Probe

Function description

The touch probe function is the same as the position latch function. Position feedback sources include the motor position. This feature latches the position information (in reference unit) when an DI signal or Z signal changes.

SV660ND series servo drives offer 2 axes and 4 touch probes to record position values corresponding to the rising edge and falling edge of each touch probe signal, which means four position values can be latched simultaneously.

When a DI is used to trigger the touch probe, the relation between the DI logic and the touch probe edge is shown in the following table.

Table 3–2 Description of bit3 of H0A.40

Bit3 of H0A.40	Touch probe edge	DI logic	DI switch
0	Rising edge	NO	OFF → ON
		NC	ON → OFF
	Falling edge	NO	ON → OFF
		NC	OFF → ON
1	Rising edge	NO/NC	OFF → ON
	Falling edge	NO/NC	ON → OFF

When a DI is used to trigger the touch probe, you can set the filter window of the touch probe signal through H0A.19 and H0A.20.

The DI touch probe supports hardware action delay compensation to compensate for the precision loss incurred by ON/OFF delay of the DI. Related parameters are shown in the following table.

Parameter		Description
H0A.40	Bit 1	Touch probe rising edge compensation: 1: Enabled, 0: Disabled
	Bit 2	Touch probe falling edge compensation: 1: Enabled, 0: Disabled
H0A.53		DI ON-compensation time for DI touch probe (DI switch changing from OFF to ON)
H0A.54		DI OFF-compensation time for DI touch probe (DI switch changing from ON to OFF)

Note

To shorten the hardware delay to about 7 μs, it is recommended to set the touch probe latch through the ON-edge of the DI.

The Z touch probe can be triggered by three sources, including the motor Z signal, frequency division output Z signal, and fully closed loop Z signal, as shown in the following table.

Feedback source	Parameter	Description
Motor encoder	H05.41.bit2 = 0, motor Z signal	The Z touch probe is triggered by the motor Z signal.

Related objects

For details, see *" 60B8h" on page 365*.

For details, see *" 60B9h" on page 366*.

For details, see *" 60BAh" on page 368*.

For details, see *" 60BBh" on page 368*.

For details, see *" 60BCh" on page 368*.

For details, see *" 60BDh" on page 369*.

For details, see *" 60D5h" on page 369*.

For details, see *" 60D6h" on page 370*.

For details, see *" 60D7h" on page 370*.

For details, see *" 60D8h" on page 370*.

Procedure

Example:

Use DI5 to trigger the touch probe. Background: touch probe 1 positive edge, continuous latching

Perform the following steps:

1. Set the function of DI5 (H03.14 = 138). Set the DI5 logic to NO (H03.11 = 0).
2. Set the touch probe function in 60B8h.
   Assignment of each bit of the touch probe function (60B8h) is shown in the following table.

   For details, see *" 60B8h" on page 365*.

   Set 60B8h to 0x0013 in this example.
3. Read the touch probe status in 60B9h.
   Assignment of each bit of 60B9h is shown in the following table.

   For details, see *" 60B9h" on page 366*.

   In this example, you can read bit1 of 60B9h to check whether the touch probe 1 positive edge value is latched.
4. Read the latch position of the touch probe
   The four position values of the touch probe are recorded in 60BAh to 60BDh.

   In this example, if the function of the position latch at the positive edge of touch probe 1 is executed, you can read the position value in 60BAh (Touch probe 1 positive edge, reference unit). The latching count can be read in 60D5h.

   Illustration

   The following figure shows touch probe function settings and status feedback sequence when DI5 is used as the trigger signal in case of latching at positive edge and continuous triggering.

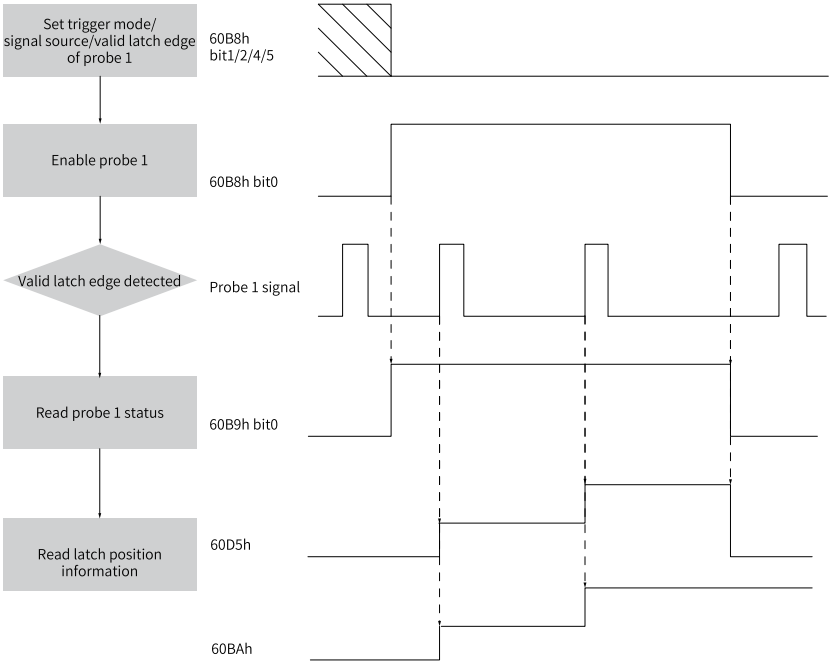


Figure 3-4 Procedure for using the touch probe

3.6 EtherCAT-forced DO

Function description

Two DO options are available by default in the non-operational (non-OP) status (including network offline) for EtherCAT-forced DO status:

1. Status unchanged in the non-OP status: The servo status switches to the non-OP status and the forced DO status stays unchanged.
2. Initialization status: No forced DO is generated when the servo drive is in the non-OP status.
   When the network switches to the operational (OP) status, the forced DO is determined by 60FE.01h and 60FE.02h.

Select the forced DO function by bits. You can select the DO as EtherCAT-forced DO by bits, which means both the local functions and EtherCAT forced-DO function can be supported by the DO.

Related objects

For details, see the following topics:

For details about related parameters, see *" H04_en.23" on page 177*.

The following *"Table 3-3 " on page 106table* describes the setpoints.

Table 3–3 Description of setpoints

Bit 0	Bit 1	Bit 2	Bit 3	Description
0	0	0	0	Status of DO1, DO2, and DO4 unchanged in the non-operational status
1	0	0	0	No output in DO1 and status of DO2-DO4 unchanged in the non-operational status.
0	1	0	0	No output in DO2 and status of DO1 and DO3-DO4 unchanged in the non-operational status.
1	1	0	0	No output in DO1 and DO2 and status of DO3-DO4 unchanged in the non-operational status.
0	0	1	0	No output in DO3 and status of DO1-DO2 and DO4 unchanged in the non-operational status.
1	0	1	0	No output in DO1 and DO3 and status of DO2 and DO4 unchanged in the non-operational status.
0	1	1	0	No output in DO2 and DO3 and status of DO1 and DO4 unchanged in the non-operational status.
1	1	1	0	No output in DO1-DO3 and status of DO4 unchanged in the non-operational status.
0	0	0	1	No output in DO4 and status of DO1-DO3 unchanged in the non-operational status.
1	0	0	1	No output in DO1 and DO4 and status of DO2 and DO3 unchanged in the non-operational status.
0	1	0	1	No output in DO2 and DO4 and status of DO1 and DO3 unchanged in the non-operational status.
1	1	0	1	No output in DO1-DO2 and DO4 and status of DO3 unchanged in the non-operational status.
0	0	1	1	No output in DO3 and DO4 and status of DO1 and DO2 unchanged in the non-operational status.
1	0	1	1	No output in DO1 and DO3-DO4 and status of DO2 unchanged in the non-operational status.

Bit 0	Bit 1	Bit 2	Bit 3	Description
0	1	1	1	No output in DO2-DO4 and status of DO1 unchanged in the non-operational status.
1	1	1	1	No output in DO1-DO4 in the nonoperational status.

Setting method:

1. Assign DO function 31 (EtherCAT-forced DO) to the DO to be controlled forcibly by EtherCAT, and then set the bit of H04.23 as needed to select the forced DO status in the non-OP status.
2. Configure 60FE.01h/60FE.02h as RPDO, and operate on bit16 to bit18 to control the DO.

4 STO Safety Function

4.1 Safety Overview

4.1.1 Terms and Abbreviations

Terms and Abbreviations	Description
Cat.	Safety category It includes B, 1, 2, 3, and 4.
CCF	Common cause failure
DCavg	Average diagnostic coverage (%)
DTI	Diagnostic test interval time
SFF	Safe failure fraction
HFT	Hardware fault tolerance
PFH	Probability of a dangerous Failure per Hour
PL	Performance Level
SC	Systematic capability
SIL	Safety integrity level
T_1	Proof test interval
DI	Digital inputs
DO	Digital output
PCB	Printed circuit board
MCU	Micro computer unit
FPGA	Field programmable gate array
MTTFd	Mean time to dangerous failure
SRA	Safety Related Application Parameter
nSRA	Non-SRA parameters
STO	The safe torque off (STO) function brings the machine safely into a no-torque state and prevents it from unexpected start. When the STO function is activated, the servo drive stops according to the preset stop mode (H02.08).

4.1.2 Safety Standards and Specifications

Standards

- EU directives and standards
  Low Voltage Directive 2014/35/EU, EN 61800-5-1

  EMC Directive 2014/30/EU Standard EN 61800-3: 2018

  Machinery Directive 2006/42/EC (Safety Functions) Standard IEC 61800-5-2

- Safety standards

Safety standards	Reference standard
Functional safety	IEC 61508: 2010 ISO 13849-1: 2015 ISO 13849-2: 2012 IEC 62061: 2021 EN 61508: 2010 EN ISO 13849-1: 2015 EN ISO 13849-2: 2012 EN IEC 62061: 2021 IEC 60204-1: 2016 (in extracts) EN 60204-1: 2018 (in extracts)
EMC	IEC 61800-5-2: 2016 IEC 61800-3: 2017 IEC 61326-3-1: 2017 IEC 61000-6-7: 2014 EN 61800-5-2: 2017 EN IEC 61800-3: 2018 EN 61326-3-1: 2017 EN 61000-6-7:2015
LVD	IEC 61800-5-1:2007/AMD1:2016 EN 61800-5-1:2007/A11:2021

- Safety parameters

Item	Safety parameters
SIL	SIL3, IEC61508 Maximum SIL3, EN IEC62061
PFH_D	$PFH_D \leq 1.1\times10^{-7}$[1/h] (1.1% of SIL3)
Cat.	3, EN ISO 13849-1
PL	e, EN ISO 13849-1
MTTFd	854 years (high)
DCavg	≥ 90% (medium)
T_1	20 years
HFT	1
SC	SC3
λ_S	2.6×10^{-7}/h
λ_{DD}	1.4×10^{-7}/h
λ_{DU}	2.7×10^{-9}/h
MTTR	0 hour
MRT	0 hour
Application mode	High demand or continuous mode
Device type	Type B

λ_S indicates the failure rate of safe failure which brings the system into safe state.

λ_{DD} indicates the failure rate of dangerous failure but can be diagnosed by the diagnosis subsystem.

λ_{DU} indicates the failure rate of dangerous failure and can't be diagnosed by the diagnosis subsystem.

Note

- See ISO13849-2: 2012 for failure modes of devices.
- Failure sharing of different failure modes of each device.
- See SN29500 for failure rate of each device.

Note

STO safety function certification is in progress.

Specifications

- Electrical safety according to IEC 61800-5-1:2016, overvoltage category II
- Environment test requirement according to IEC 61800-5-1:2016
- Operating conditions are shown as follows.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Ambient/Storage temperature</td><td>0℃ to 55℃/-20℃ to +70℃</td></tr>
<tr><td>Ambient/Storage humidity</td><td>20% to 95% RH, non-condensing</td></tr>
<tr><td>Vibration</td><td>
<table>
<tr><th>Item</th><th>Test condition</th></tr>
<tr><td>Test reference</td><td>IEC 60068-2-6 4.6</td></tr>
<tr><td>Condition</td><td>EUT is powered on and works normally.</td></tr>
<tr><td>Motion mode</td><td>Sinusoidal</td></tr>
<tr><td>Vibration amplitude/ Acceleration</td><td>-</td></tr>
<tr><td>10 Hz ≤ f ≤ 57 Hz</td><td>0.075 mm vibration amplitude</td></tr>
<tr><td>57 Hz < f ≤ 150 Hz</td><td>1 g</td></tr>
<tr><td>Vibration duration</td><td>10 times on each of the three mutually perpendicular axes</td></tr>
<tr><td>Axis</td><td>X, Y, Z</td></tr>
<tr><td>Installation</td><td>According to the manufacturer's specifications</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Shock resistance</td><td>
<table>
<tr><th>Item</th><th>Test condition</th></tr>
<tr><td>Test reference</td><td>IEC 60068-2-27 2008 Table 17</td></tr>
<tr><td>Condition</td><td>EUT is powered on and works normally.</td></tr>
<tr><td>Motion mode</td><td>Half-sine pulse</td></tr>
<tr><td>Shock amplitude/ Time</td><td>50 m/s ^{2} (5 g) for 30 ms</td></tr>
<tr><td>Number of shocks</td><td>3 per axis on each of three mutually perpendicular axes</td></tr>
<tr><td>Axis</td><td>±X, ±Y, ±Z</td></tr>
<tr><td>Installation</td><td>According to the manufacturer's specifications</td></tr>
</table>
</td></tr>
<tr><td>IP rating</td><td>IP20</td></tr>
<tr><td>Pollution degree (PD)</td><td>PD2: free of corrosive or explosive gases; free of exposure to water, oil or chemicals; free of dust, salts or iron dust</td></tr>
<tr><td>Altitude</td><td>Not higher than 2000 m</td></tr>
<tr><td>Cooling method</td><td>Dry clean air (natural convection)</td></tr>
<tr><td>Others</td><td>No static electricity, no strong electromagnetic field, no magnetic field, and no radioactivity</td></tr>
</table>

- The drive complies with EMC standards EN/IEC 61800-3:2017, IEC 61326-3-1, and IEC 61800-5-2.
- Others

Item	Description
Applicable servo drives	SV6***S2R8I-FS SV6***S5R5I-FS
Position	Integrated on the control board of the drive
Safety function - Inputs	Two channels: STO1 and STO2

The STO subsystem elements must always be able to operate within the range of temperature, humidity, corrosion, dust, and vibration and other requirements specified above.

4.1.3 Precautions

Safety instructions

This chapter contains the warning symbols used in this guide and the safety instructions with which you must comply when you install or maintain safety modules of a drive or an inverter. If you ignore the safety instructions, injury, death or damage can occur. Read this chapter before you start the installation.

Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products to which this manual is applicable.

The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual.

Table 4–1 Warnings, cautions, and descriptions

Warning symbol	Indication	Description	Consequence of negligence
Examples  General hazards  Special hazards Electric shock	DANGER	Danger	Indicates that failure to comply with the notice can result in death or severe personal injury.
	WARNINGS	Warning	Indicates that failure to comply with the notice may result in death or severe personal injury.
	CAUTION	Caution	Indicates that failure to comply with the notice may result in minor or moderate personal injury or equipment damage.
	STOP	Inhibition	Indicates that failure to comply with the notice can result in equipment or environmental damage.

CAUTION

- High attention is required for electrical installation and at the system design to avoid hazards either in normal operation or in the event of equipment malfunction.
- System design, installation, commissioning and maintenance must be carried out by personnel who have the necessary training and experience. They must read the operating instruction and this safety information.

It is the responsibility of the machine builder/OEM/system integrator to make sure that the stipulations specified in the Machinery Directive are met. The manufacturer or its authorized distributor is obliged to conduct hazard analysis before delivering a product to the market, take appropriate measures to reduce/eliminate related hazards, and ensure that proper components are selected.

This section describes the information that needs to be noted before you start operation. Read the following safety instructions, risk assessment information, and limitations before starting operation.

Comprehend all the instructions before you use the safety function STO. Incorrect use of safety functions or use of safety functions that do not meet the safety requirements of the site may result in personal injury.

Safety measures

Carefully read and observe the following important precautions when using the safety function STO:

- The STO function is not a substitute for the emergency stop (E-stop) function. If only the STO function is triggered but no extra measures are taken, the power supply cannot be cut off in emergencies and high-current parts of the motor and drive are still energized, resulting in the risk of electric shock or others risks caused by electric energy. Therefore, maintenance work on electrical parts of the drive or motor can be performed only after the drive system is isolated from the main power supply.
- Depending on the standards and requirements for a particular applicable scenario, it may be possible to use STO as an integral part of the E-stop system. However, the main purpose of STO in a dedicated safety control arrangement is to prevent risks without the use of an E-stop.
- An E-stop is often provided in a machine to allow operators who identify an unexpected hazard to take actions to prevent accidents.
- The design requirements for emergency stop are different from those for safety interlock. Generally, the E-stop function needs to be independent from any complex or "intelligent" control. It may use purely electromechanical devices to either disconnect the power or initiate a controlled rapid stop by using other means such as dynamic or regenerative braking.

Note

- The design of safety-related systems requires specialist knowledge. To ensure that a complete control system is safe, it is necessary for the whole system to be designed according to recognized safety principles. The use of individual sub-systems such as drives with STO function, which are intended for safety-related applications, does not in itself ensure that the complete system is safe.
- The STO function can be used to stop the drive in emergency stop situations.
- In processes without personnel protection, it is recommended not to stop the drive by using the STO function. If a drive running is stopped by using STO, the drive performs a coast-to-stop. If this is not acceptable, the system should be stopped using the correct mode instead of the STO function.
- This publication is a guide to the application of Inovance SV660 series safety functions, and also on the design of safety-related systems for machinery control.
- It is the responsibility of the designer of the end product or application to ensure that it is safe and in compliance with the relevant regulations.

Risk assessment

- When using the safety functions, perform risk assessment on the servo system in advance. Make sure that the safety integrity level of the standards is met.
- The following residual risks may arise even when the safety functions operate. Therefore, safety must always be given consideration during risk assessment.
- If external forces, such as gravitational force of a vertical axis, are applied when the safety functions are operating, the motor will rotate due to the action of these external forces. Therefore, you must use a separate mechanical brake to secure the motor.

Note

In the case of failure of multiple IGBTs, regardless of whether the STO function is enabled, the servo drive can generate an alignment torque. This torque can cause the motor shaft to rotate within a range of up to 180/p (for a synchronous reluctance motor, the range is 180/2p).

To ensure safety, you should determine all the risk assessments and residual risks in the entire machine equipment. Companies and individuals that establish safety-related systems must take full responsibility for system installation and commissioning. Additionally, when complying with a European machinery directive, the system must acquire safety standards certification as a whole.

Perform all risk assessments and safe level certification to the machine or the system as a whole. It is recommended that a Certification Body final safety certification of the system be used.

The following section shows the residual risks concerning the safety observation function of this product.

Common residual risks

- At the shipment to end-users, check the settings of safety-related components by using programming tools and monitored/displayed contents on display and record and save the setting data concerning the safety observation function and the programming tools you used. Perform the checks by using a check sheet.
- Safety can be ensured only after installing, wiring, and adjustment are properly completed. For details about installation, wiring, and commissioning, see the Installation chapter.
- Only qualified personnel are authorized to install, perform trial runs, repair, or adjust the equipment in which these components are installed. Only trained engineers should install and operate the equipment.
- Separate the wiring of the safety observation function from other signal wiring.
- Protect the cables with appropriate measures, such as routing them in a cabinet by using a cable guard.

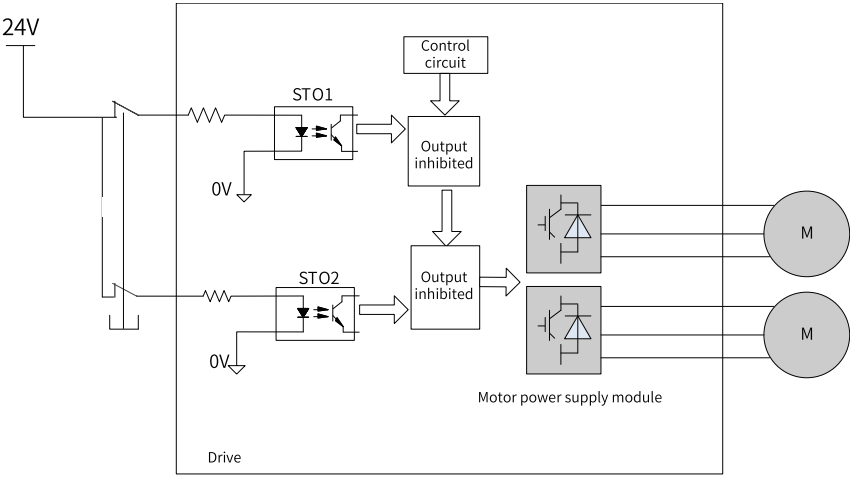
- We recommend that you use a switch, a relay, or a sensor that complies with safety standards. If you need to use a switch, a relay, or a sensor that does not comply with safety standards, perform safety checks.
- Keep a required clearance and creepage distance depending on the voltage that you use.
- The time of a safety observation error depends on parameter settings.

Safe torque off (STO)

This function only cuts off the torque of the motor, and does not cut off the power supply of the servo or inverter. Before servicing the servo or inverter, cut off the power supply and ensure that the servo and inverter are not energized.

4.2 STO

4.2.1 Overview



Switch off the motor power supply module to cut off the motor current and motor torque.

Figure 4-1 Schematics of the STO function

Safe Torque Off (STO) is a safety function that complies with IEC 61800-5-2:2016. It is built into Inovance SV680 series servo drives.

The STO function inhibits the control signal of the power semiconductors on the drive output end, preventing the drive from generating torque at the motor shaft end.

The STO function prevents movement of the motor by using two redundant external hardware signals (STO1 and STO2) that block the PWM signals from being outputted to the power layer of the servo drive. STO1 and STO2 input signals must be both active to allow the servo drive to operate normally.

The following table describes the STO function.

STO1 input	STO2 Input	PWM signal
H	H	Normal
L	H	Inhibited
H	L	Inhibited
L	L	Inhibited

STO (safe torque)	
Definition	Cuts off the power of the motor.
Description	The STO function brings the machine safely into a no-torque state and prevents the machine from unexpected startup. When the STO function is enabled, the servo stops according to the stop mode (H02.08).
Safety state	Disables the PWM gating signal of the drive.
Operation mode	High demand mode or continuous mode.

4.2.2 Function Use and Monitoring

Function Use

The keypad displays the STO function state and error information.

See the following table to identify the cause of a fault and the action to be taken. Contact Inovance technical support if the fault persists after corrective actions listed in the following table are taken.

Fault codes related to the STO function are listed in the following table:

Fault Code	state	Description	Cause	Corrective Action
E150.1	Status of STO1 and STO2 inconsistent	Only one of STO1 and STO2 is in "Low" state, status of STO1 and STO2 are inconsistent.	The input states of STO1 and STO2 are inconsistent.	1. Ensure the requests for disconnecting the voltage of STO1 and STO2 are triggered simultaneously. 2. The input circuit is abnormal and a certain STO input signal is still in the"H" state after the 24 V signal is disconnected. Contact Inovance for technical support.
E150.2	STO activated	OV/UV of the 5V power supply is detected.	OV/UV of the 5V power supply.	Restore the 5 V power supply to normal state. Contact Inovance for technical support.

Fault Code	state	Description	Cause	Corrective Action
E150.3	STO activated	The input circuit of STO works improperly.	The input circuit of STO works improperly.	Fix the input circuit fault. Contact Inovance for technical support.
E150.4	STO activated	The buffer circuit of STO works improperly.	The buffer circuit of STO works improperly.	Fix the buffer circuit fault. Contact Inovance for technical support.

Note

- For a motor with brake, if either STO1 or STO2 closes, the drive will be disabled within 30 ms (STO response time).
- For a motor without brake, if either STO1 or STO2 closes, the drive will be disabled within 5 ms (STO response time).

EDM DO signal

When STO1 and STO2 input 24V voltage are cut off, the EDM DO signal is active, otherwise the EDM DO signal is inactive.

At this time, STO1 and STO2 are filtered signals. When EDM is active, the servo drive blocks the PWM signal.

Signal Name	Mark	Photo coupler logic			
Safety input	STO1	ON	ON	OFF	OFF
	STO2	ON	OFF	ON	OFF
EDM output	EDM	OFF	OFF	OFF	ON

Note

The DO output of this EDM is only a monitoring signal to detect whether a safety function is triggered, not a safety signal output.

The EDM state of the integrated STO can only be output through the non-safe DO output of the drive, not through the DO output on the safety module.

EDM DO output wiring diagram

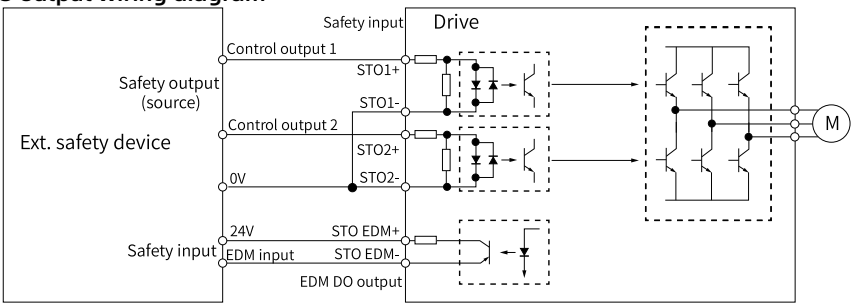


Figure 4-2 Wiring of external safety device to the drive (single axis)

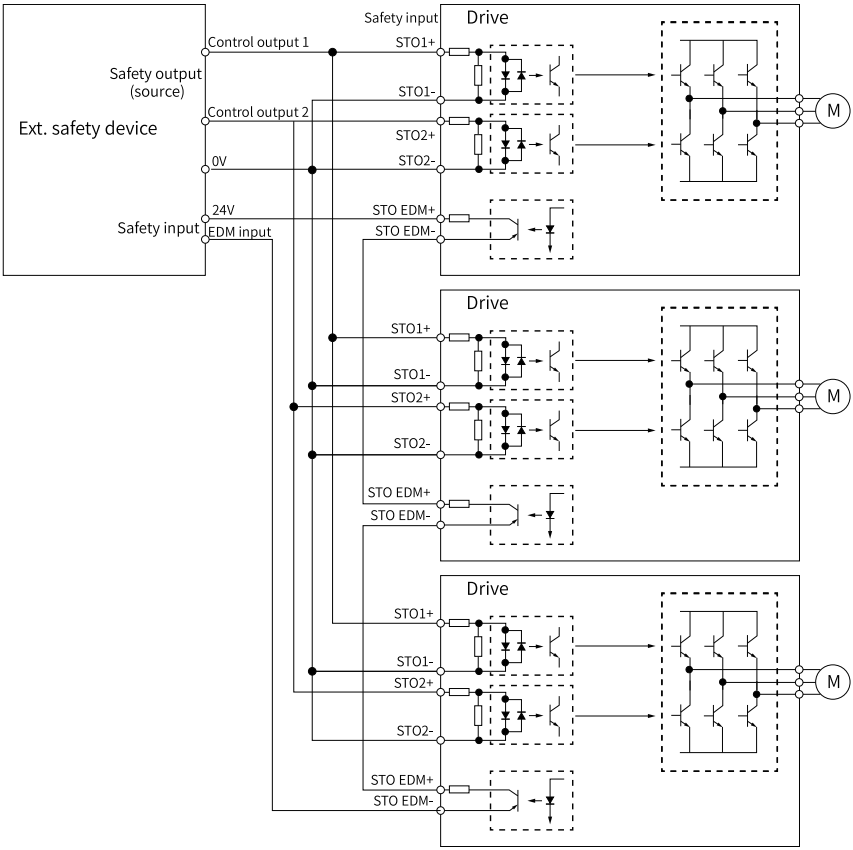
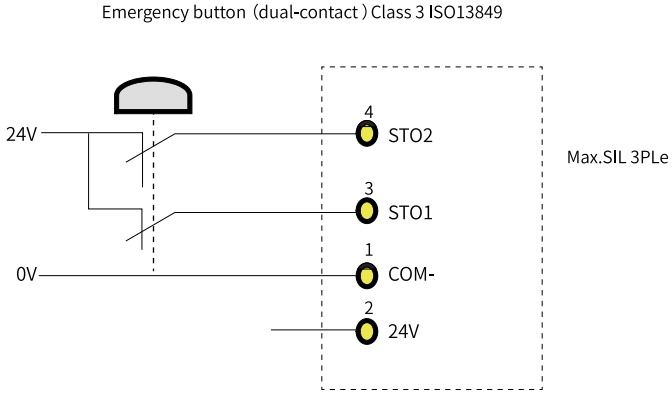


Figure 4-3 Wiring of external safety device to the drive (multi-axis)

Application Example of Safety Function

Example:



4.2.3 Fault reset

The exceptional operation refers to the durations of power-on and initialization, and how to return from the STO state.

- The PWM buffer is disabled as the enable terminal is pulled up during power-on, so the PWM signal is inhibited.
- The PWM buffer is disabled as the enable terminal is pulled up during initialization of the MCU, so the PWM signal is inhibited. Such condition is cleared and servo drive works normally after initialization is done.
- When all of the following conditions are met, the servo system that enters the safe state through the STO function can be back to normal with the safe state cleared after auto-reset of the drive.
  - The input state of the STO request must be "high".
  - The servo ON or servo RUN command must be inactive.
  - No dangerous faults exist.

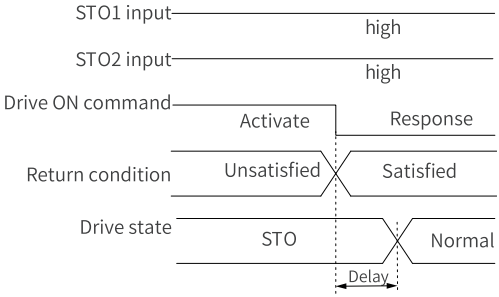


Figure 4-4 Return condition of servo ON/RUN command

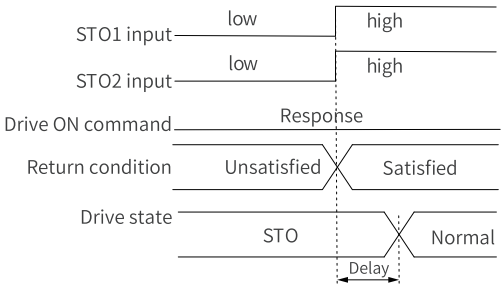


Figure 4-5 Return condition of external STO request state

- When STO_IN (STO1 or STO2 input) is restored to 24 V, the EDM and servo ready signals are immediately reset to 0. After 200 milliseconds, the servo operation signal is activated (when STO_IN keeps at 24 V). Servo operation is PWM drive signal output.

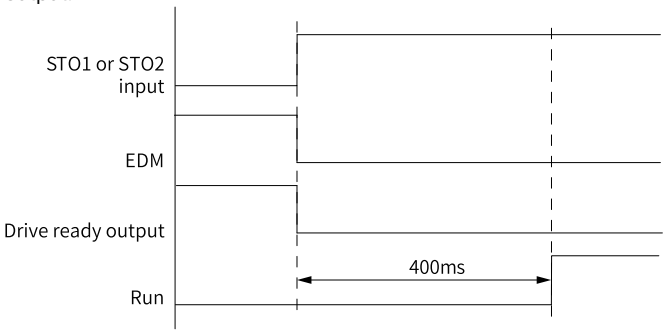
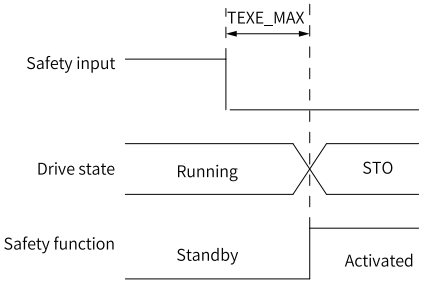


Figure 4-6 Servo drive reset timing diagram

4.2.4 Safety Function Response Time

STO function prevents the movement of the motor by two redundant external hardware signals: STO1 and STO2 that block the PWM signals to the power layer of the servo drive. STO1 and STO2 input signals must be both active to allow the servo drive to operate normally.

If either or both of them are at low level simultaneously, the PWM signal will be blocked in the next 30 ms.



4.3 Acceptance

Basic requirements

- Technical staff must be trained to understand the requirements and principles of designing and operating safety-related systems.
- Person performing the maintenance must be trained to understand the requirements and principles of designing and operating safety-related systems.
- Operators must be trained to understand the requirements and principles of designing and operating safety-related systems.
- The safety-related circuit on the control board that fails to operate must be replaced with a new one as it is not repairable.

Commissioning Checklist

- Start-up test and validation
  IEC 61508, EN/IEC 62061 and EN ISO 13849 require the final assembler of the equipment to verify the operation of the safety function through acceptance testing. This acceptance test is described in the drive manual. The testing of optional safety features is described in the corresponding manuals.

  The acceptance test must be performed:

  - at initial start-up of the safety function
  - After any changes related to safety functions (wiring, assembly, settings, or other related operations)
  - after any maintenance work related to the safety function.

  The acceptance test of the safety function must be carried out by an authorized person with expertise and knowledge of the safety function. The test must be documented and signed by the test staff.

  Signed acceptance test reports must be stored in the logbook of the machine. The report shall include documentation of start-up activities and test results, fault reports, and troubleshooting records. Any new acceptance tests performed due to changes or maintenance need to be logged into the logbook.

- Checklist of integrated STO functions

Step	Action	Result
1	Ensure that the drive runs and stops freely during commissioning.	
2	Stop the drive (if running), switch the input power supply off and isolate the drive from the power line by a disconnector.	
3	Check the STO circuit connections against the circuit diagram.	
4	Check that the shield of the STO input cable is grounded to the drive frame.	
5	Close the disconnector and switch the power supply on.	
5.1	Test the STO signal #1 when the motor is stopped: Set STO1 and STO2 to H. Send a stop command to the drive (if running) and wait until the motor shaft is at standstill. Awake the STO function by de-energizing (low state or open-circuit) the STO input signal #1 and send a start command to the drive. Ensure that the motor stays at a standstill and the keypad of the drive displays "E150.1".	
5.2	Set STO1 to "H" and disable the ON/RUN command of the drive. Then, reset the drive automatically and enable ON/RUN command of the drive. Finally, check whether the motor runs normally.	
5.3	Test the STO signal #2 when the motor is stopped: Set STO1 and STO2 to H. Send a stop command to the drive (if running) and wait until the motor shaft is at standstill. Awake the STO function by de-energizing (low state or open-circuit) the STO input signal #2 and give a start command for the drive. Ensure that the motor stays at a standstill and the keypad of the drive displays "E150.1".	
5.4	Set STO2 to "H" and disable the ON/RUN command of the drive. Then, reset the drive automatically and enable ON/RUN command of the drive. Finally, check whether the motor runs normally.	
6.1	Test the STO channel 1 when the motor is running: Set STO1 and STO2 to H. Start the drive and ensure the motor is running. Awake the STO function by de-energizing (low state or open-circuit) the STO input signal 1. Ensure that the motor stops and the drive trips. Reset the fault and try to start the drive. Ensure that the motor stays at a standstill and the keypad of the drive displays "E150.1".	
6.2	Set STO1 to "H" and disable the ON/RUN command of the drive. Then, reset the drive automatically and enable ON/RUN command of the drive. Finally, check whether the motor runs normally.	

Step	Action	Result
6.3	Test the STO channel 2 when the motor is running: Set STO1 and STO2 to H. Start the drive and ensure the motor is running. Awake the STO function by de-energizing (low state or open-circuit) the STO input signal 2. Ensure that the motor stops and the drive trips. Reset the fault and try to start the drive. Ensure that the motor stays at a standstill and the keypad of the drive displays "E150.1".	
6.4	Set STO2 to "H" and disable the ON/RUN command of the drive. Then, reset the drive automatically and enable ON/RUN command of the drive. Finally, check whether the motor runs normally.	
7	Document and sign the acceptance test report which verifies that the safety function is safe and acceptable for operation.	

Special requirements

You must conduct STO diagnosis every three month by powering off and powering on the drive once, or running the STO function once.

Note

There are two ways to perform STO diagnosis:

- Power off and restart;
- Trigger and then cancel STO.

You can use either of them.

---

5 Description of Parameters

5.1 H00 Servo Motor Parameters

H00.00 Motor code

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	14101	Data Type:	UInt16
Default:	14101	Change:	At stop

Value Range:

0–14101

Description

14000: Inovance 20-bit incremental encoder motor

14101: Inovance 23-bit absolute encoder motor

14102: Inovance 26-bit absolute encoder motor (26-bit is not supported)

H00.02 Customized No.

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	4294967295.00	Data Type:	UInt32
Default:	0.00	Change:	Unchangeable

Value Range:

0.00–4294967295.00

Description

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

H00.04 Encoder version

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0–6553.5

Description

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

H00.05 Serial-type motor code

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

Value Range:

0–65535

Description

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

H00.06 FPGA customized SN

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00–655.35

Description

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

H00.07 STO version

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	-
Max.:	655.4	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0–655.4

Description

Display the software version number of STO function.

H00.08 Serial encoder type

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

Value Range:

0–65535

Description
14100: Multi-turn absolute encoder
Others: Single-turn absolute encoder

H00.09 Rated voltage

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: 220 V
1: 380 V
Description
0: 220 V
1: 380 V

H00.10 Rated power

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	kW
Max.:	655.35	Data Type:	UInt16
Default:	0.75	Change:	At stop

Value Range:
0.01 kW–655.35 kW
Description
-

H00.11 Rated current

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	A
Max.:	655.35	Data Type:	UInt16
Default:	4.70	Change:	At stop

Value Range:
0.01 A to 655.35 A
Description
-

H00.12 Rated torque

Address:	-	Effective Time:	Upon the next power-on

Min.: 0.10 Unit: N·m
Max.: 655.35 Data Type: UInt16
Default: 2.39 Change: At stop
Value Range:
0.10N·m-655.35N·m
Description
-

H00.13 Max. torque
Address: - Effective Time: Upon the next power-on
Min.: 0.10 Unit: N·m
Max.: 655.35 Data Type: UInt16
Default: 7.16 Change: At stop
Value Range:
0.10N·m-655.35N·m
Description
-

H00.14 Rated speed
Address: - Effective Time: Upon the next power-on
Min.: 100 Unit: rpm
Max.: 9999 Data Type: UInt16
Default: 3000 Change: At stop
Value Range:
100rpm-9999rpm
Description
-

H00.15 Maximum speed
Address: - Effective Time: Upon the next power-on
Min.: 100 Unit: rpm
Max.: 9999 Data Type: UInt16
Default: 6000 Change: At stop
Value Range:
100rpm-9999rpm
Description
-

H00.16 Moment of inertia

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	$kgcm^2$
Max.:	655.35	Data Type:	UInt16
Default:	1.30	Change:	At stop

Value Range:
0.01 $kgcm^2$–655.35 $kgcm^2$
Description
-

H00.17 Number of PMSM pole pairs

Address:	-	Effective Time:	Upon the next power-on
Min.:	2	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	5	Change:	At stop

Value Range:
2–65535
Description
-

H00.18 Stator resistance

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.001	Unit:	Ω
Max.:	65.535	Data Type:	UInt16
Default:	0.500	Change:	At stop

Value Range:
0.001 Ω to 65.535 Ω
Description
-

H00.19 Stator inductance Lq

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	mH
Max.:	655.35	Data Type:	UInt16
Default:	3.27	Change:	At stop

Value Range:
0.01mH–655.35mH
Description
-

H00.20 Stator inductance Ld

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	mH
Max.:	655.35	Data Type:	UInt16
Default:	3.87	Change:	At stop

Value Range:
0.01mH-655.35mH
Description
-

H00.21 Linear back EMF coefficient

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	mV/rpm
Max.:	655.35	Data Type:	UInt16
Default:	33.30	Change:	At stop

Value Range:
0.01 mV/rpm to 655.35 mV/rpm
Description
-

H00.22 Torque coefficient Kt

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	N·m/Arms
Max.:	655.35	Data Type:	UInt16
Default:	0.51	Change:	At stop

Value Range:
0.01 N·m/Arms to 655.35 N·m/Arms
Description
-

H00.23 Electrical constant Te

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	6.54	Change:	At stop

Value Range:
0.01 ms to 655.35 ms
Description
-

H00.24 Mechanical constant Tm

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	0.24	Change:	At stop

Value Range:
0.01 ms to 655.35 ms
Description
-

H00.28 Absolute encoder position offset

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	8192	Change:	At stop

Value Range:
0–4294967295
Description
Saves the values obtained from angle auto-tuning.

H00.30 Encoder selection (Hex)

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	4095	Data Type:	UInt16
Default:	19	Change:	At stop

Value Range:
19: Inovance encoder
Description
0x00: Regular incremental encoder (UVW-ABZ)
0x01: Wire-saving encoder (ABZ[UVW])
0x02: Regular incremental encoder (ABZ, without UVW)
0x10: TAMAGAWA encoder
0x12: Nikon encoder
0x13: Inovance encoder
0x30: Optical scale

H00.31 Encoder PPR

Address:	-	Effective Time:	Upon the next power-on
Min.:	1	Unit:	PPR

Max.:	1073741824	Data Type:	UInt32
Default:	67108864	Change:	At stop

Value Range:
1P/Rev–1073741824P/Rev
Description
Defines the number of pulses fed back by the encoder per motor revolution.

H00.33 Electrical angle of Z signal

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.0	Unit:	°
Max.:	360.0	Data Type:	UInt16
Default:	180.0	Change:	At stop

Value Range:
0.0° to 360.0°
Description
-

H00.34 Electrical angle of phase U rising edge

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.0	Unit:	°
Max.:	360.0	Data Type:	UInt16
Default:	180.0	Change:	At stop

Value Range:
0.0° to 360.0°
Description
-

H00.35 Serial-type motor model

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0–65535
Description
-

H00.37 Absolute encoder function setting bit

Address:	-	Effective Time:	Upon the next power-on

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

Value Range:
0-65535
Description
-

H00.60 Motor attribute

Address: -
Effective Time: Upon the next power-on
Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt16
Change: At stop

Value Range:
0-65535
Description
-

H00.61 Brake close time

Address: -
Effective Time: Upon the next power-on
Min.: 0
Max.: 65535
Default: 0
Unit: ms
Data Type: UInt16
Change: At stop

Value Range:
0 ms to 65535 ms
Description
-

H00.62 Brake release time

Address: -
Effective Time: Upon the next power-on
Min.: 0
Max.: 65535
Default: 0
Unit: ms
Data Type: UInt16
Change: At stop

Value Range:
0 ms to 65535 ms
Description
-

H00.63 Maximum motor current

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.00	Unit:	A
Max.:	65535.00	Data Type:	UInt32
Default:	0.00	Change:	At stop

Value Range:
0.00 A to 65535.00 A
Description
-

H00.65 Rated motor current

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.00	Unit:	A
Max.:	65535.00	Data Type:	UInt32
Default:	0.00	Change:	At stop

Value Range:
0.00 A to 65535.00 A
Description
-

H00.67 Moment of inertia

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	$kgcm^2$
Max.:	42950	Data Type:	UInt32
Default:	0	Change:	At stop

Value Range:
0 $kgcm^2$–42950 $kgcm^2$
Description
-

H00.69 Linear back EMF coefficient

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.01	Unit:	mV/rpm
Max.:	42949672.95	Data Type:	UInt32
Default:	0.00	Change:	At stop

Value Range:
0.01 mV/rpm to 42949672.95 mV/rpm
Description
-

H00.71 Motor carrier frequency

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	Hz
Max.:	65535	Data Type:	UInt16
Default:	8000	Change:	At stop

Value Range:
0 Hz to 65535 Hz
Description
Sets the carrier frequency of the motor. It is effective when bit13 of H00.60 is 1.

H00.72 Max. motor allowable demagnetizing current

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	%
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0% to 65535%
Description
Effective when greater than 0. Assigns H00.72 to H07.25 when the motor field weakening is on.

H00.73 Bit01 of motor SN code

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

Value Range:
0–65535
Description
-

H00.74 Bit23 of motor SN code

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

Value Range:
0–65535

Description
-

H00.75 Bit45 of motor SN code

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

Value Range:
0-65535
Description
-

H00.76 Bit67 of motor SN code

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

Value Range:
0-65535
Description
-

H00.77 Bit89 of motor SN code

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

Value Range:
0-65535
Description
-

H00.78 Bit11 of motor SN code

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

Value Range:

0-65535
Description
-

H00.79 Bit13 of motor SN code

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

Value Range:
0-65535
Description
-

H00.80 Bit15 of motor SN code

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

Value Range:
0-65535
Description
-

H00.98 Motor attribute check

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

Value Range:
0-65535
Description
-

5.2 H01 Drive Parameters

H01.00 MCU software version

Address:	-	Effective Time:	-

Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0-6553.5

Description

Displays MCU software version (with one decimal place).

H01.01 FPGA software version

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0-6553.5

Description

Displays the FPGA software version, with 1 decimal place.

H01.02 Servo drive series No.

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

Value Range:

0-65535

Description

Display servo drive serial number, with 0 decimal place.

H01.07 Software test version

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00-655.35

Description

Displays the software test version, with 2 decimal places.

H01.08 Model parameter version

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0–6553.5

Description

Displays model parameter version, with 1 decimal place.

H01.10 Drive series No.

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	3	Change:	At stop

Value Range:

3: S2R8

5: S5R5

Description

Displays the drive series number, with no decimal place.

H01.11 DC-AC voltage class

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

Value Range:

0 V to 65535 V

Description

Display inverter voltage level, with 0 decimal place.

H01.12 Rated power of the drive

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	kW
Max.:	10737418.24	Data Type:	UInt32
Default:	0.40	Change:	Unchangeable

Value Range:

0.00 kW–10737418.24 kW

Description

Display the rated power of the drive, with 2 decimal places.

H01.14 Max. output power of the drive

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	kW
Max.:	10737418.24	Data Type:	UInt32
Default:	0.40	Change:	Unchangeable

Value Range:

0.00 kW–10737418.24 kW

Description

Displays the maximum output power of the drive, with 2 decimal places.

H01.16 Rated output current of the drive

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	A
Max.:	10737418.24	Data Type:	UInt32
Default:	2.80	Change:	Unchangeable

Value Range:

0.00 A to 10737418.24 A

Description

Displays the rated output current of the drive, with 2 decimal places.

H01.18 Max. output current of the drive

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	A
Max.:	10737418.24	Data Type:	UInt32
Default:	10.10	Change:	Unchangeable

Value Range:

0.00 A to 10737418.24 A

Description

Displays the maximum output current of the drive, with 2 decimal places.

H01.20 Carrier frequency

Address:	-	Effective Time:	Upon the next power-on
Min.:	4000	Unit:	Hz
Max.:	20000	Data Type:	UInt16
Default:	8000	Change:	At stop

Value Range:
4000 Hz to 20000 Hz
Description
Displays the carrier frequency, with no decimal place.

H01.21 Dead zone time

Communication address:	-	Effective mode:	Upon the next power-on
Min.:	2.00	Unit:	μs
Max.:	20.00	Data type:	UInt16
Default:	2.00	Change mode:	At stop

Value range:
2.00μs to 20.00μs
Description
Displays the dead zone time, with two decimal places.

H01.22 D-axis coupling voltage compensation coefficient

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	1000.0	Data Type:	UInt16
Default:	50.0	Change:	Immediately

Value Range:
0.0% to 1000.0%
Description
Display D-axis coupling voltage compensation coefficient, with 1 decimal place.

H01.23 Q-axis back EMF compensation coefficient

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	1000.0	Data Type:	UInt16
Default:	50.0	Change:	Immediately

Value Range:
0.0% to 1000.0%
Description
Display Q-axis back EMF compensation coefficient, with 1 decimal place.

H01.24 D-axis current loop gain

Address:	-	Effective Time:	Real time

Min.:	0	Unit:	Hz
Max.:	20000	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:
0 Hz to 20000 Hz
Description
Displays D-axis current loop gain, with no decimal place.

H01.25 D-axis current loop integral compensation factor

Address:	-	Effective Time:	Real time
Min.:	0.01	Unit:	-
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.01-100.00
Description
Display D-axis current loop integral compensation factor, with 2 decimal places.

H01.26 Sinc3 filter data extraction rate in current sampling

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Extraction rate 32
1: Extraction rate 64
2: Extraction rate 128
3: Extraction rate 256
Description
Displays Sinc3 filter data extraction rate in current sampling, with no decimal place.

H01.27 Q-axis current loop gain

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	20000	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:
0 Hz to 20000 Hz

Description
Displays Q-axis current loop gain, with no decimal place.

H01.28 Q-axis current loop integral compensation factor

Address:	-	Effective Time:	Real time
Min.:	0.01	Unit:	-
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.01–100.00
Description
Displays Q-axis current loop integral compensation factor, with 2 decimal places.

H01.29 Q-axis coupling voltage compensation coefficient

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	1000.0	Data Type:	UInt16
Default:	50.0	Change:	Immediately

Value Range:
0.0% to 1000.0%
Description
Display Q-axis coupling voltage compensation coefficient, with 1 decimal place.

H01.30 Bus voltage gain tuning

Address:	-	Effective Time:	Real time
Min.:	50.0	Unit:	%
Max.:	150.0	Data Type:	UInt16
Default:	100.0	Change:	At stop

Value Range:
50.0% to 150.0%
Description
Displays bus voltage gain adjustment, with 1 decimal place.

H01.31 Minimum ON time of bootstrap circuit lower bridge

Commu-nication address:	-	Effective mode:	Upon the next power-on
Min.:	0.0	Unit:	μs

Max.:	20.0	Data type:	UInt16
Default:	0.0	Change mode:	At stop

Value range:
0.0 μs to 20.0 μs
Description
Displays the minimum ON time of bootstrap circuit lower bridge, with 1 decimal place.

H01.32 Relative gain of UV sampling

Address:	-	Effective Time:	Upon the next power-on
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	32768	Change:	At stop

Value Range:
1-65535
Description
Displays the relative gain of UV sampling, with no decimal place.

H01.34 Drive over-temperature threshold

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	℃
Max.:	150	Data Type:	UInt16
Default:	95	Change:	Immediately

Value Range:
0℃ to 150℃
Description
Displays the drive over-temperature threshold, with no decimal place.

H01.36 Current sensor range

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.00	Unit:	A
Max.:	9999.99	Data Type:	UInt32
Default:	21.33	Change:	At stop

Value Range:
0.00 A to 9999.99 A
Description
Displays the current sensor range, with 2 decimal places.

H01.38 FPGA phase current protection threshold

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	90.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
Displays FPGA phase current protection threshold, with 1 decimal place.

H01.39 Current loop version

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0–65535
Description
Displays the current loop version, with no decimal place.

H01.40 DC bus overvoltage protection threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	V
Max.:	2000	Data Type:	UInt16
Default:	420	Change:	Immediately

Value Range:
0 V to 2000 V
Description
Displays DC bus overvoltage protection threshold, with 0 decimal place.

H01.41 DC bus voltage discharge threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	V
Max.:	2000	Data Type:	UInt16
Default:	380	Change:	Immediately

Value Range:
0 V to 2000 V
Description
Display DC bus voltage discharge threshold, with no decimal place.

H01.42 DC bus undervoltage threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	V
Max.:	2000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:
0 V to 2000 V
Description
Displays DC bus undervoltage threshold, with no decimal place.

H01.52 D-axis proportional gain in performance priority mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	20000	Data Type:	UInt16
Default:	2000	Change:	Immediately

Value Range:
0 Hz to 20000 Hz
Description
Display D-axis proportional gain in performance priority mode, with no decimal place.

H01.53 D-axis integral gain in performance priority mode

Address:	-	Effective Time:	Real time
Min.:	0.01	Unit:	-
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.01-100.00
Description
Displays D-axis integral gain in performance priority mode, with 2 decimal places.

H01.54 Q-axis proportional gain in performance priority mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	20000	Data Type:	UInt16
Default:	2000	Change:	Immediately

Value Range:
0 Hz to 20000 Hz

Description

Displays Q-axis proportional gain in performance priority mode, with no decimal place.

H01.55 Q-axis integral gain in performance priority mode

Address:	-	Effective Time:	Real time
Min.:	0.01	Unit:	-
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.01–100.00

Description

Displays Q-axis integral gain in performance priority mode, with 2 decimal places.

H01.56 Current loop low-pass cutoff frequency

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	Hz
Max.:	65535	Data Type:	UInt16
Default:	11000	Change:	At stop

Value Range:

0 Hz to 65535 Hz

Description

Displays current loop low-pass cutoff frequency, with no decimal place.

H01.59 Serial encoder data transmission compensation time

Commu-nication address:	-	Effective mode:	Upon the next power-on
Min.:	0.000	Unit:	μs
Max.:	10.000	Data type:	UInt16
Default:	0.000	Change mode:	At stop

Value range:

0.000 μs to 10.000 μs

Description

Display the data transmission compensation time of the serial encoder, with three decimal places.

H01.60 FPGA scheduling frequency selection

Address:	-	Effective Time:	Upon the next power-on
Min.:	1	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

2: 8 kHz

Description

Selects FPGA scheduling frequency, with no decimal place.

H01.61 Command scheduling frequency

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: 4 kHz

1: 2 kHz

2: 1 kHz

Description

Selects the command scheduling frequency, with no decimal place.

H01.62 Auto-tuning of drive model

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

Value Range:

0–65535

Description

Displays the auto-tuned drive model, with no decimal place.

H01.66 Current loop configuration

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	kHz
Max.:	31	Data Type:	UInt16
Default:	12	Change:	Immediately

Value Range:

0 kHz to 31 kHz

Description

Displays current loop configuration, with no decimal place.

H01.67 Dead zone compensation coefficient

Address:	-	Effective Time:	Upon the next power-on
Min.:	0.00	Unit:	-
Max.:	2.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.00–2.00

Description

Displays the dead zone compensation coefficient, with two decimal places.

H01.68 Current observer cutoff frequency

Address:	-	Effective Time:	Real time
Min.:	200	Unit:	-
Max.:	5000	Data Type:	UInt16
Default:	2000	Change:	Immediately

Value Range:

200–5000

Description

Displays current observer cutoff frequency, with no decimal place.

H01.69 Current observer correction coefficient

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	9.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.00–9.00

Description

Displays current observer correction coefficient, with 2 decimal places.

H01.72 Hide IGBT model identification

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0-65535
Description
Displays whether to hide IGBT model identification, with no decimal place.

H01.73 Sigma-delta signal phase compensation time

Communication address:	-	Effective mode:	Upon the next power-on
Min.:	0	Unit:	μs
Max.:	65535	Data type:	UInt16
Default:	1	Change mode:	At stop

Value range:
0 μs to 65535 μs
Description
Displays Sigma-delta signal phase compensation time, with no decimal place.

H01.75 Current loop amplification factor

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.00-655.35
Description
Displays current loop amplification coefficient, with 2 decimal places.

H01.78 Control voltage undervoltage threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	V
Max.:	2000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:
0 V to 2000 V
Description
Displays control power undervoltage threshold, with no decimal place.

H01.79 Control voltage gain adjustment

Address:	-	Effective Time:	Upon the next power-on

Min.:	50.0	Unit:	%
Max.:	150.0	Data Type:	UInt16
Default:	100.0	Change:	At stop

Value Range:
50.0% to 150.0%
Description
Displays control voltage gain adjustment, with 1 decimal place.

H01.82 Filter time of PL and CPL

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	32767	Data Type:	UInt16
Default:	4000	Change:	At stop

Value Range:
0–32767
Description
Displays PL and CPL filter time, with no decimal place.

H01.83 AO zero offset

Address:	-	Effective Time:	Real time
Min.:	-500	Unit:	mV
Max.:	500	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:
-500 mV to 500 mV
Description
Adjusts AO zero offset.

H01.84 AO ratio

Address:	-	Effective Time:	Real time
Min.:	0.000	Unit:	-
Max.:	2000.000	Data Type:	UInt16
Default:	1000.000	Change:	Immediately

Value Range:
0.000–2000.000
Description
Adjusts the AO ratio.

H01.89 Junction temperature parameter version

Address:	-	Effective Time:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000-65.535

Description

Display the version number of the junction temperature parameter.

5.3 H02 Basic Control Parameters

H02.00 Control mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	9	Data Type:	UInt16
Default:	9	Change:	At stop

Value Range:

0: Velocity mode

1: Position mode

2: Torque mode

9: EtherCAT mode

Description

0: Velocity mode

1: Position mode

2: Torque mode

9: EtherCAT mode

H02.01 Absolute system selection

Address:	-	Effective Time:	Upon the next power-on
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 Rotation direction selection

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

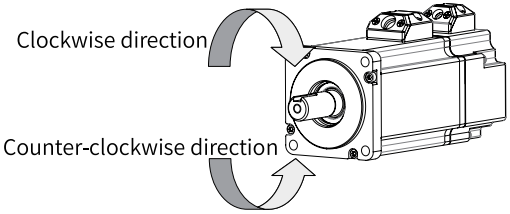
0: Counterclockwise (CCW) as forward direction

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	Counterclockwise (CCW) as forward direction	Defines the CCW direction as the forward direction when a forward run command is received, indicating the motor rotates in the CCW direction when viewed from the motor shaft side.
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.



H02.05 Stop mode at S-ON OFF

Commu-nication address:	-	Effective mode:	Real time
Min.:	-4	Unit:	-
Max.:	2	Data type:	Int16
Default:	0	Change mode:	Real time

Value range:

-4: Ramp to stop as defined by 6085h, keeping dynamic braking state
-3: at zero speed, 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: 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.

Value	Stop mode
-4	Ramp to stop as defined by 6085h, keeping dynamic braking status
-3	Stop at zero speed, keeping dynamic braking status
-2	Ramp to stop as defined by 6084h/609Ah, keeping dynamic braking status
-1	Dynamic braking stop, keeping dynamic braking status
0	Coast to stop, keeping de-energized status
1	Ramp to stop as defined by 6084h/609Ah, keeping de-energized status
2	Dynamic braking stop, keeping de-energized status

Set a proper stop mode according to the mechanical status and operation requirements.

For comparison of stop modes, see section "Servo Stop".

After the brake output function is enabled, and motor stop mode is "forced braking" (bit2 of H0A.71 is 0), the stop mode upon S-ON OFF is forcibly set to "Ramp to stop as defined by 6085h, keeping dynamic braking status".

H02.06 Stop mode at No.2 fault

Communication address:	-	Effective mode:	Real time
Min.:	-5	Unit:	-
Max.:	4	Data type:	Int16
Default:	2	Change mode:	Real time

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 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:	-	Effective Time:	Real time
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, keeping de-energized state
4: Stop based on ramp, 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

Commu-nication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default:	2	Change mode:	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.

H02.09 Delay from brake output ON to command received

Address:	-	Effective Time:	At stop
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	250	Change:	Immediately

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.

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

Address:	-	Effective Time:	Real time
Min.:	50	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	150	Change:	Immediately

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.

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

Address:	-	Effective Time:	Real time
Min.:	20	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	30	Change:	Immediately

Value Range:
20 rpm to 3000 rpm
Description
Defines the motor speed threshold when brake (BK) output is OFF in the rotating state.

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

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

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.

H02.16 Brake enable switch

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

Value Range:

0: OFF

1: ON

Description

Turn on or off the brake function.

H02.17 Stop mode upon main circuit power failure

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

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

Description

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

H02.18 Quick stop mode

Address:	-	Effective Time:	At stop
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	2	Change:	Immediately

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

H02.20 Dynamic brake relay coil ON delay

Address:	-	Effective Time:	Real time
Min.:	10	Unit:	ms
Max.:	30000	Data Type:	UInt16
Default:	30	Change:	Immediately

Value Range:

10 ms to 30000 ms

Description

-

H02.21 Permissible minimum resistance of regenerative resistor

Address:	-	Effective Time:	-
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: - Effective Time: -

Min.: 0 Unit: W

Max.: 65535 Data Type: UInt16

Default: 50 Change: Unchangeable

Value Range:

0 W–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: - Effective Time: -

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.

Servo drive model (SV660ND, SV630ND)		Specifications of Built-in Regenerative Resistor	
		Resistance (Ω)	Power (W)
Single-phase 220 V	SV6*0NDS2R8I	-	-
	SV6*0NDS5R5I	25	80
Three-phase 220 V	SV6*0NDS2R8I	-	-
	SV6*0NDS5R5I	25	80

H02.24 Resistor heat dissipation coefficient

Address: - Effective Time: Real time

Min.: 10 Unit: %

Max.:	100	Data Type:	UInt16
Default:	30	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	3	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	1	Unit:	W
Max.:	65535	Data Type:	UInt16
Default:	40	Change:	Immediately

Value Range:

1 W–65535 W

Description

Defines the power of external regenerative resistor.

H02.27 Resistance of external regenerative resistor

Address:	-	Effective Time:	Real time
Min.:	15	Unit:	Ω
Max.:	1000	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:

15 Ω to 1000 Ω

Description

Defines the resistance of the external regenerative resistor.

H02.30 User password

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–65535

Description

-

H02.31 System parameter initialization

Address:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:

0–99

Description

Sets the offset of the parameter to be displayed on the operating panel.

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 operating panel.

H02.35 Keypad data update frequency

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	20	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 Hz to 20 Hz

Description

-

H02.41 Manufacturer password

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–65535

Description

-

H02.47 Delayed brake closing time of power cable breakage

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0–1000

Description

It is applicable to applications with vertical axis load.

It is effective only when the power cable is broken, the servo speed feedback is greater than H02.11 and there is no servo OFF (H02.12). Otherwise, brake OFF will be implemented if any one of the three conditions is met.

5.4 H03 Terminal Input Parameters

H03.02 DI1 function selection

Communication address:	-	Effective mode:	Real time
Min.:	100	Unit:	-
Max.:	139	Data type:	UInt16
Default:	114	Change mode:	Real time

Value range:

100: [Axis 1]Undefined
101: [Axis 1]Servo enable
102: [Axis 1]Alarm reset signal
114: [Axis 1]Positive limit switch
115: [Axis 1]Negative limit switch
131: [Axis 1]Home switch
134: [Axis 1]Emergency stop
138: [Axis 1]Touch probe 1
139: [Axis 1]Touch probe 2

Description

Defines the function of DI1.
The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.03 DI1 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

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

H03.04 DI2 function selection

Communication address:	-	Effective mode:	Real time
Min.:	200	Unit:	-
Max.:	239	Data type:	UInt16

Default:	214	Change mode:	Real time

Value range:

200: [Axis 2]Undefined
201: [Axis 2]Servo enable
202: [Axis 2]Alarm reset signal
214: [Axis 2]Positive limit switch
215: [Axis 2]Negative limit switch
231: [Axis 2]Home switch
234: [Axis 2]Emergency stop
238: [Axis 2]Touch probe 1
239: [Axis 2]Touch probe 2

Description

Defines the function of DI2.
The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.05 DI2 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.06 DI3 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	100	Unit:	-
Max.:	139	Data type:	UInt16
Default:	115	Change mode:	Real time

Value range:

100: [Axis 1]Undefined
101: [Axis 1]Servo enable
102: [Axis 1]Alarm reset signal
114: [Axis 1]Positive limit switch
115: [Axis 1]Negative limit switch
131: [Axis 1]Home switch
134: [Axis 1]Emergency stop
138: [Axis 1]Touch probe 1
139: [Axis 1]Touch probe 2

Description

Defines the function of DI3.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.07 DI3 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.08 DI4 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	200	Unit:	-
Max.:	239	Data type:	UInt16
Default:	215	Change mode:	Real time

Value range:

200: [Axis 2]Undefined
201: [Axis 2]Servo enable
202: [Axis 2]Alarm reset signal
214: [Axis 2]Positive limit switch
215: [Axis 2]Negative limit switch
231: [Axis 2]Home switch
234: [Axis 2]Emergency stop
238: [Axis 2]Touch probe 1
239: [Axis 2]Touch probe 2

Description

Defines the function of DI4.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.09 DI4 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.10 DI5 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	100	Unit:	-
Max.:	139	Data type:	UInt16
Default:	131	Change mode:	Real time

Value range:

100: [Axis 1]Undefined
101: [Axis 1]Servo enable
102: [Axis 1]Alarm reset signal
114: [Axis 1]Positive limit switch
115: [Axis 1]Negative limit switch
131: [Axis 1]Home switch
134: [Axis 1]Emergency stop
138: [Axis 1]Touch probe 1
139: [Axis 1]Touch probe 2

Description

Defines the function of DI5.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.11 DI5 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.12 DI6 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	200	Unit:	-
Max.:	239	Data type:	UInt16
Default:	231	Change mode:	Real time

Value range:

200: [Axis 2]Undefined
201: [Axis 2]Servo enable
202: [Axis 2]Alarm reset signal
214: [Axis 2]Positive limit switch
215: [Axis 2]Negative limit switch
231: [Axis 2]Home switch
234: [Axis 2]Emergency stop
238: [Axis 2]Touch probe 1
239: [Axis 2]Touch probe 2

Description

Defines the function of DI6.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.13 DI6 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.14 DI7 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	100	Unit:	-
Max.:	139	Data type:	UInt16
Default:	138	Change mode:	Real time

Value range:

100: [Axis 1]Undefined
101: [Axis 1]Servo enable
102: [Axis 1]Alarm reset signal
114: [Axis 1]Positive limit switch
115: [Axis 1]Negative limit switch
131: [Axis 1]Home switch
134: [Axis 1]Emergency stop
138: [Axis 1]Touch probe 1
139: [Axis 1]Touch probe 2

Description

Defines the function of DI7.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.15 DI7 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.16 DI8 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	200	Unit:	-
Max.:	239	Data type:	UInt16
Default:	238	Change mode:	Real time

Value range:

200: [Axis 2]Undefined
201: [Axis 2]Servo enable
202: [Axis 2]Alarm reset signal
214: [Axis 2]Positive limit switch
215: [Axis 2]Negative limit switch
231: [Axis 2]Home switch
234: [Axis 2]Emergency stop
238: [Axis 2]Touch probe 1
239: [Axis 2]Touch probe 2

Description

Defines the function of DI8.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H03.17 DI8 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open
1: Closed

Description

-

H03.50 Voltage-type AI1 offset

Address:	-	Effective Time:	Real time
Min.:	-5000	Unit:	mV
Max.:	5000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

-5000 mV to 5000 mV

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms

Max.:	655.35	Data Type:	UInt16
Default:	2.00	Change:	Immediately

Value Range:

0.00 ms to 655.35 ms

Description

It sets the filter time constant of voltage signal input from AI1.

Set this parameter properly to avoid motor reference fluctuation caused by unstable analog voltage input and reduce motor misoperation caused by interference signals.

The filter function cannot eliminate or suppress zero drift or dead zone.

H03.53 Voltage-type AI1 dead zone

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	mV
Max.:	1000.0	Data Type:	UInt16
Default:	10.0	Change:	Immediately

Value Range:

0.0 mV to 1000.0 mV

Description

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

H03.54 Voltage-type AI1 zero drift

Address:	-	Effective Time:	Real time
Min.:	-500	Unit:	mV
Max.:	500.0	Data Type:	Int16
Default:	0.0	Change:	Immediately

Value Range:

-500.0 mV to 500.0 mV

Description

Zero drift refers to the value of the drive o 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 after adjustment will be saved into H03.54.

H03.60 DI1 filter time

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16

Default:	0.50	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

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 fitter time

Commu-nication address:	-	Effective mode:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data type:	UInt16
Default:	0.50	Change mode:	Real time

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 fitter time

Commu-nication address:	-	Effective mode:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data type:	UInt16
Default:	0.50	Change mode:	Real time

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 fitter time

Communication address:	-	Effective mode:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data type:	UInt16
Default:	0.50	Change mode:	Real time

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.

5.5 H04 Terminal Output Parameters

H04.00 DO1 function selection

Communication address:	-	Effective mode:	Real time
Min.:	100	Unit:	-
Max.:	132	Data type:	UInt16
Default:	101	Change mode:	Real time

Value range:

100: [Axis 1]Undefined
101: [Axis 1]Servo ready
102: [Axis 1]Motor rotation signal
109: [Axis 1] Braking output
110: [Axis 1] Warning
111: [Axis 1]Failure
125: [Axis 1]Comparison output
131:[Axis 1]Forced communication DO
132: [Axis 1]EDM output

Description

Defines the function of DO1.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H04.01 DO1 logic selection

Address:	-	Effective Time:	Real time

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

Value Range:

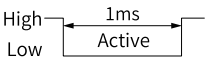
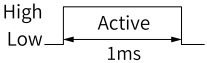
0: Normally open

1: Closed

Description

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

DO1 to DO3 are normal DOs, requiring the minimum output signal width to be 1 ms. The host controller must be able to receive valid DO logic changes.

Setpoint	DO1 Logic Upon Active DO Function	Transistor Status	Minimum Signal Width
0	Low level	ON	
1	High level	OFF	

Before receiving DO logic changes, view the setpoint of H0d.17 (Forced DI/DO selection) to check whether the DO level is determined by the actual operating status of the drive or by forced DO (H0d.19 or 60FEh).

H04.02 DO2 function selection

Commu-nication address:	-	Effective mode:	Real time
Min.:	200	Unit:	-
Max.:	232	Data type:	UInt16
Default:	201	Change mode:	Real time

Value range:

200: [Axis 2]Undefined

201: [Axis 2]Servo ready

202: [Axis 2]Motor rotation signal

209: [Axis 2] Braking output

210: [Axis 2] Warning

211: [Axis 2]Failure

225: [Axis 2]Comparison output

231:[Axis 2]Forced communication DO

232: [Axis 2]EDM output

Description

Defines the function of DO2.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H04.03 DO2 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open

1: Closed

Description

-

H04.04 DO3 function selection

Communication address:	-	Effective mode:	Real time
Min.:	100	Unit:	-
Max.:	132	Data type:	UInt16
Default:	109	Change mode:	Real time

Value range:

100: [Axis 1]Undefined

101: [Axis 1]Servo ready

102: [Axis 1]Motor rotation signal

109: [Axis 1] Braking output

110: [Axis 1] Warning

111: [Axis 1]Failure

125: [Axis 1]Comparison output

131:[Axis 1]Forced communication DO

132: [Axis 1]EDM output

Description

Defines the function of DO3.

The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H04.05 DO3 logic selection

Address:	-	Effective Time:	Real time

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

Value Range:
0: Normally open
1: Closed
Description
-

H04.06 DO4 function selection

Communication address:	-	Effective mode:	Real time
Min.:	200	Unit:	-
Max.:	232	Data type:	UInt16
Default:	209	Change mode:	Real time

Value range:
200: [Axis 2]Undefined
201: [Axis 2]Servo ready
202: [Axis 2]Motor rotation signal
209: [Axis 2] Braking output
210: [Axis 2] Warning
211: [Axis 2]Failure
225: [Axis 2]Comparison output
231:[Axis 2]Forced communication DO
232: [Axis 2]EDM output
Description
Defines the function of DO4.
The DIDO terminal is shared between the two axes. You only need to configure parameter numbers for group H03 and group H04 of axis 1.

H04.07 DO4 logic selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Normally open
1: Closed
Description
-

H04.22 DO source selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: DO1 output source
0: DO1 function output
1: bit0 of H31.04
bit1: DO2 output source
0: DO2 function output
1: bit1 of H31.04
bit2: DO3 output source
0: DO3 function output
1: bit2 of H31.04
bit3: DO4 output source
0: DO4 function output
1: bit3 of H31.04

Description

Defines whether the logic of a physical DO terminal is defined by the actual state of the drive or by communication.

H04.23 ECAT communication-forced DO logic in non-OP status

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

Sets DO state upon ECAT communication failure.

H04.50 AO1 signal selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

10: Defined by H31.05

Description

Defines the physical value source of AO1.

H04.51 AO1 offset voltage

Address:	-	Effective Time:	Real time
Min.:	-10000	Unit:	mV
Max.:	10000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

-10000 mV to 10000 mV

Description

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

H04.52 AO1 multiplier

Address:	-	Effective Time:	Real time
Min.:	-99.99	Unit:	-
Max.:	99.99	Data Type:	Int16
Default:	1.00	Change:	Immediately

Value Range:

-99.99–99.99

Description

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

5.6 H05 Position Control Parameters

H05.02 Pulses per revolution

Address:	-	Effective Time:	Upon the next power-on
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.

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

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	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.

H05.06 Moving average filter time constant 1

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	128.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:
0.0 ms to 128.0 ms
Description
Defines the moving average filter time constant of position references.

H05.07 Electronic gear ratio 1 (numerator)

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	1	Change:	Immediately

Value Range:
1-1073741824

Description

Defines the numerator of electronic gear ratio 1.

H05.09 Electronic gear ratio 1 (denominator)

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	1	Change:	Immediately

Value Range:

1-1073741824

Description

Defines the denominator of electronic gear ratio 1.

H05.16 Clear action

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

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

Description

Defines the condition for clearing the position deviation.

H05.19 Speed feedforward control

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: No speed feedforward

1: Internal speed feedforward

2: 60B1h

3: Zero phase

Description

Defines the source of the speed loop feedforward signal.

In the position control mode, speed feedforward can be used to improve the position reference response speed.

Setpoint	Speed feedforward source	Remarks
0	No speed feedforward	-
1	Internal speed feedforward	The speed information corresponding to the position reference (encoder unit) is used as the speed loop feedforward source.
2	60B1 used as speed feedforward	60B1h is used as the source of external speed feedforward signal in the CSP mode. The polarity of 60B1h can be set in bit6 of 607Eh.
3	Zero phase control	Zero phase control can be used together with H08.17 (Zero phase delay) to reduce the position follow-up deviation during startup.

Speed feedforward control parameters include H08.18 (Speed feedforward filter time constant) and H08.19 (Speed feedforward gain). See section "Feedforward Gain" for details.

H05.30 Homing selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	6	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled,

6: Current position

Description

Defines the homing mode and the trigger signal source.

H05.35 Homing time limit

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Defines the maximum homing time.

H05.36 Mechanical home offset

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648 to 2147483647

Description

Defines the absolute position of the motor after homing.

H05.40 Mechanical home offset and action upon overtravel

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

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.

H05.50 Mechanical gear ratio in absolute position rotation mode (numerator)

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1-65535

Description
Defines the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

H05.51 Mechanical gear ratio in absolute position rotation mode (denominator)

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:
1-65535
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:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:

0.0% to 400.0%

Description

Defines the maximum positive/negative torque limit in homing upon hit-and-stop.

H05.60 Hold time of positioning completed

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	30000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 30000 ms

Description

Defines the hold time of an active positioning completed signal.

H05.66 Homing time unit

Address:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	At stop

Value Range:

-2147483648 to 2147483647

Description

-

H05.71 Motor Z signal width

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	4	Change:	Immediately

Value Range:

1 ms to 100 ms

Description

Output pulse width when motor Z signal is active.

5.7 H06 Speed Control Parameters

H06.00 Source of main speed reference A

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Digital setting (H06.03)

Description

Defines the source of main speed reference A.

H06.01 Source of auxiliary speed reference B

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Digital setting (H06.03)

Description

Defines the source of auxiliary speed reference B.

H06.02 Speed reference source

Address:	-	Effective Time:	Real time
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.

H06.03 Speed reference set through keypad

Address:	-	Effective Time:	Real time
Min.:	-9999	Unit:	rpm
Max.:	9999	Data Type:	Int16
Default:	200	Change:	Immediately

Value Range:

-9999rpm to 9999rpm

Description

Defines the speed reference value through the keypad.

H06.05 Acceleration ramp time of speed reference

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Defines the source of speed reference acceleration ramp time. 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:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
Defines the source of speed reference deceleration ramp time.

H06.07 Maximum speed limit

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	6000	Change:	Immediately

Value Range:
0rpm-9999rpm
Description
Defines the speed reference source of maximum speed threshold.

H06.08 Forward speed limit

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	6000	Change:	Immediately

Value Range:
0rpm-9999rpm
Description
Defines the speed reference source of forward speed threshold.

H06.09 Reverse speed limit

Address:	-	Effective Time:	Real time

Min.:	0	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	6000	Change:	Immediately

Value Range:

0rpm-9999rpm

Description

Defines the speed reference source of reverse speed threshold.

H06.10 Deceleration unit in emergency stop

Address:	-	Effective Time:	Real time
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

Sets the deceleration unit in emergency stop.

H06.11 Torque feedforward control

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: No torque feedforward

1: Internal torque feedforward

2: 60B2h as external torque feedforward

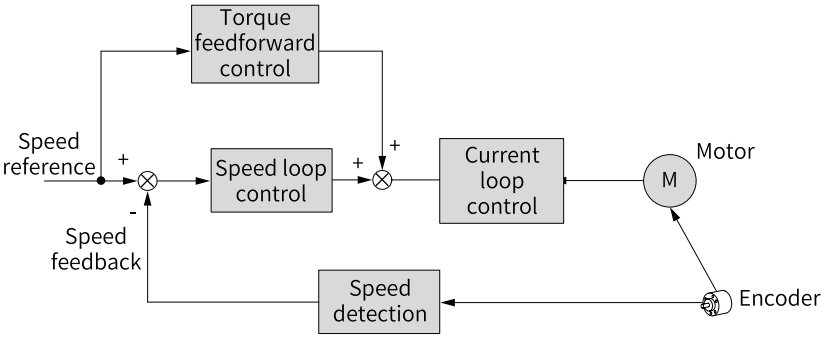
Description

Defines the speed reference source for torque feedforward control.

Setpoint	Torque feedforward control	Remarks
0	/	-
1	Internal torque feedforward	The speed reference is used as the torque feedforward signal source, which is further divided into the following two situations: In the position control mode, the speed reference refers to that output from the position controller. In the speed control mode, the speed reference refers to that set by the user.
2	60B2h used as external torque feedforward source	60B2h is used as the external torque feedforward signal source in the CSP and CSV modes. The polarity of the torque feedforward signal can be set in bit5 of 607Eh. Note: When 60B2h is used as the torque feedforward signal, you can adjust (H08.21) and time constant (H08.20) to achieve the desired performance.

Parameters of the torque feedforward function include H08.21 (Torque feedforward filter time constant) and H08.20 (Torque feedforward gain). For details, see section Feedforward Gain.

The block diagram for torque feedforward control in control modes other than torque control is as follows:



H06.12 Acceleration ramp time of jog speed

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16

Default:	10	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Defines the speed reference source for jog speed acceleration ramp time.

H06.13 Speed feedforward smoothing filter

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	μs
Max.:	65535	Data type:	UInt16
Default:	0	Change mode:	Real time

Value range:

0 μs to 65535 μs

Description

Defines the speed reference source of the speed feedforward smoothing filter.

H06.15 Zero clamp speed threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0rpm-9999rpm

Description

Defines the speed reference source of zero clamp speed threshold.

H06.16 Threshold of TGON (motor rotation) signal

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	20	Change:	Immediately

Value Range:

0rpm-1000rpm

Description

Defines the speed reference source of TGON (motor rotation) signal threshold.

H06.17 Threshold of V-Cmp (speed matching) signal

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	100	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0rpm-100rpm

Description

Defines the speed reference source of V-Cmp (speed matching) signal threshold.

H06.18 Threshold of speed reach signal

Address:	-	Effective Time:	Real time
Min.:	20	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:

20rpm-9999rpm

Description

Defines the speed reference source of speed reach signal threshold.

H06.19 Threshold of zero speed output signal

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

1rpm-9999rpm

Description

Defines the speed reference source of zero speed output signal threshold.

H06.26 Torque fluctuation auto-tuning enable

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0-1

Description

Sets the speed reference source of torque fluctuation auto-tuning enable.

H06.28 Cogging torque ripple compensation

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0–1

Description

Sets the speed reference source of cogging torque fluctuation compensation enable.

H06.31 Sine reference frequency

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	16000	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:

0–16000

Description

Sets the sine reference frequency.

H06.32 Sine reference amplitude

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	30000	Data Type:	UInt16
Default:	30	Change:	Immediately

Value Range:

0–30000

Description

Sets sine reference amplitude.

H06.33 Sine reference enable

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16

Default: 0 Change: Immediately

Value Range:

0–3

Description

Enables sine reference.

H06.34 Sine reference initial phase

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-
Max.:	360.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:

0.0–360.0

Description

Defines the speed reference source of the sine reference initial phase.

H06.35 Sine reference offset

Address:	-	Effective Time:	Real time
Min.:	-9900	Unit:	-
Max.:	9900	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

-9900–9900

Description

Defines the speed reference source of the sine reference offset.

H06.50 Speed S-curve enable switch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

0: Accelerate/Decelerate at fixed acceleration rate

1: Accelerate/Decelerate based on the S-curve

H06.51 Increasing acceleration of speed S-curve acceleration segment

Address:	-	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
-

H06.52 Decreasing acceleration of speed S-curve acceleration segment

Address:	-	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
-

H06.53 Decreasing deceleration of speed S-curve deceleration segment

Address:	-	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
-

H06.54 Decreasing acceleration of speed S-curve deceleration segment

Address:	-	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
-

5.8 H07 Torque Control Parameters

H07.00 Source of main torque reference A

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Keypad (H07.03)

Description

Defines the source of the main torque reference A.

H07.01 Source of auxiliary torque reference B

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Keypad (H07.03)

Description

Defines the source of auxiliary torque references.

H07.02 Torque reference source

Address:	-	Effective Time:	Real time
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

Selects the source of torque references.

H07.03 Torque reference set through keypad

Address:	-	Effective Time:	Real time

Min.:	-400	Unit:	%
Max.:	400.0	Data Type:	Int16
Default:	0.0	Change:	Immediately

Value Range:
-400.0% to 400.0%
Description
Defines the torque reference value that set through the keypad.

H07.05 Torque reference filter time constant 1

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	30.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

Value Range:
0.00 ms to 30.00 ms
Description
Defines torque reference source of torque reference filter.

H07.06 Torque reference filter time constant 2

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	30.00	Data Type:	UInt16
Default:	0.27	Change:	Immediately

Value Range:
0.00 ms to 30.00 ms
Description
Defines torque reference source of torque reference filter.

H07.07 Torque limit source

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: FWD/REV internal torque limit
Description
Defines the torque reference source of torque limit source.

H07.09 Positive internal torque limit

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	350.0	Change:	Immediately

Value Range:

0.0% to 400.0%

Description

Defines the torque reference source of positive internal torque.

H07.10 Negative internal torque limit

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	350.0	Change:	Immediately

Value Range:

0.0% to 400.0%

Description

Defines the torque reference source of negative internal torque.

H07.11 Positive external torque limit

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	350.0	Change:	Immediately

Value Range:

0.0% to 400.0%

Description

Defines the torque reference source of positive external torque limit.

H07.12 Negative external torque limit

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	350.0	Change:	Immediately

Value Range:

0.0% to 400.0%

Description

Defines the torque reference source of negative external torque limit.

H07.15 Emergency-stop torque

Address:	-	Effective Time:	At stop
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:

0.0% to 400.0%

Description

Set torque command source for emergency stop.

H07.17 Speed limit source

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Internal speed limit

Description

Defines the speed reference source of speed limit source.

H07.19 Positive speed limit/Speed limit 1 in torque control

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	3000	Change:	Immediately

Value Range:

0rpm–9999rpm

Description

Defines the positive torque reference source in torque control.

H07.20 Negative speed limit/Speed limit 2 in torque control

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	9999	Data Type:	UInt16
Default:	3000	Change:	Immediately

Value Range:

0rpm–9999rpm

Description

Defines the negative torque reference source in torque control.

H07.21 Base value for torque reach

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:
0.0% to 400.0%
Description
Defines the torque reference source of the base value for torque reach.

H07.22 Torque reach valid value

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	20.0	Change:	Immediately

Value Range:
0.0% to 400.0%
Description
Defines the torque reference source of torque reach DO.

H07.23 Invalid value for torque reach

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	10.0	Change:	Immediately

Value Range:
0.0% to 400.0%
Description
Defines the torque reference source of torque reach DO.

H07.24 Field weakening depth

Address:	-	Effective Time:	Real time
Min.:	60	Unit:	%
Max.:	115	Data Type:	UInt16
Default:	115	Change:	Immediately

Value Range:
60% to 115%
Description
Defines the torque reference source of flux weakening.

H07.25 Max. permissible demagnetizing current

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	300	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0% to 300%

Description

Defines the torque reference source of max. permissible demagnetizing current.

H07.26 Field weakening selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Defines the torque reference source of flux weakening.

H07.27 Flux weakening gain

Address:	-	Effective Time:	Real time
Min.:	0.001	Unit:	Hz
Max.:	1.000	Data Type:	UInt16
Default:	0.030	Change:	Immediately

Value Range:

0.001 Hz to 1.000 Hz

Description

Defines the torque reference source of flux weakening.

H07.28 Speed of flux weakening point

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

Defines the torque reference source of flux weakening point.

H07.35 Motor torque output correction enable

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Enables or disables motor torque output correction.

H07.36 Time constant of low-pass filter 2

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	10.00	Data Type:	UInt16
Default:	0.00	Change:	Immediately

Value Range:

0.00 ms to 10.00 ms

Description

Defines the torque reference source of low-pass filter 2.

H07.37 Torque reference filter selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: First-order filter

1: Biquad filter

Description

Defines torque reference source of torque reference filter.

H07.38 Biquad filter attenuation ratio

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-

Max.:	50	Data Type:	UInt16
Default:	16	Change:	At stop

Value Range:
0–50
Description
Defines the torque reference source of the biquad filter.

H07.40 Speed limit window in the torque control mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	300	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:
0 ms to 300 ms
Description
Sets speed limit time window in the torque control mode.

5.9 H08 Gain Parameters

H08.00 Speed loop gain

Address:	-	Effective Time:	Real time
Min.:	0.1	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	40.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.15	Unit:	ms
Max.:	512.00	Data Type:	UInt16
Default:	19.89	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.1	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	64.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.1	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	75.0	Change:	Immediately

Value Range:

0.1 Hz to 2000.0 Hz

Description

-

H08.04 2nd speed loop integral time constant

Address:	-	Effective Time:	Real time
Min.:	0.15	Unit:	ms
Max.:	512.00	Data Type:	UInt16
Default:	10.61	Change:	Immediately

Value Range:

0.15 ms to 512.00 ms

Description

-

H08.05 2nd position loop gain

Address:	-	Effective Time:	Real time
Min.:	0.1	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	120.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Immediately

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

Defines the gain switchover condition.

H08.10 Gain switchover delay

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	1000.0	Data Type:	UInt16
Default:	5.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20000	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:

0–20000

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:	-	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	20000	Data Type:	UInt16
Default:	30	Change:	Immediately

Value Range:

0–20000

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 ≥ H08.12. Otherwise, the drive forcibly sets H08.11 to the same value as H08.12.

H08.13 Position gain switchover time

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	1000.0	Data Type:	UInt16
Default:	3.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	120.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.00–120.00

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.

H08.16 ITune parameter save

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0-65535
Description
-

H08.17 Zero phase delay

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	4.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:
0.0 ms to 4.0 ms
Description
-

H08.18 Speed feedforward filter time constant

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	64.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

Value Range:
0.00 ms to 64.00 ms
Description
Defines the filter time constant of speed feedforward.

H08.19 Speed feedforward gain

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	64.00	Data Type:	UInt16
Default:	0.50	Change:	Immediately

Value Range:
0.00 ms to 64.00 ms
Description
Defines the filter time constant of torque feedforward.

H08.21 Torque feedforward gain

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	300.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

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.
Increasing the setpoint improves the responsiveness to 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:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
Min.:	100	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	200.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	50	Unit:	Hz
Max.:	600	Data Type:	UInt16
Default:	170	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	1	Unit:	%
Max.:	1600	Data Type:	UInt16
Default:	100	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	10.00	Data Type:	UInt16
Default:	0.80	Change:	Immediately

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.

H08.30 Disturbance compensation time

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	100.00	Data Type:	UInt16
Default:	0.20	Change:	Immediately

Value Range:

0.00 ms to 100.00 ms

Description

Defines the compensation time of the disturbance observer. Increase the setpoint properly in case of large speed feedback noise.

H08.31 Disturbance cutoff frequency

Address:	-	Effective Time:	Real time
Min.:	10	Unit:	Hz
Max.:	4000	Data Type:	UInt16
Default:	600	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16

Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	1	Unit:	%
Max.:	1600	Data Type:	UInt16
Default:	100	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	-90	Unit:	°
Max.:	90	Data Type:	Int16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	1000	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	300	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled

1: Enabled

Description

Used to set the enable bit for speed observer.

H08.42 Model control selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disable

1: Enable

2: Dual-inertia model

Description

Used to enable model tracking control.

H08.43 Model gain

Address:	-	Effective Time:	Real time
Min.:	0.1	Unit:	-
Max.:	2000.0	Data Type:	UInt16

Default:	40.0	Change:	Immediately

Value Range:

0.1–2000.0

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.

H08.45 Model feedforward position

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0–1

Description

Sets the single inertia model feedforward position.

H08.46 Feedforward value

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-
Max.:	102.4	Data Type:	UInt16
Default:	95.0	Change:	Immediately

Value Range:

0.0–102.4

Description

Defines the speed feedforward gain for single inertia model control. If overshoot occurs, reduce the setpoint properly.

H08.50 Model torque feedforward differential time

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Immediately

Value Range:

0.00 ms to 655.35 ms

Description

Sets the single inertia model control torque feedforward differential time.

H08.51 Model speed feedforward differential time

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	20.00	Data Type:	UInt16
Default:	0.00	Change:	Immediately

Value Range:

0.00 ms to 20.00 ms

Description

Sets the single inertia model control speed feedforward differential time.

H08.53 Medium- and low-frequency jitter suppression frequency 3

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	Hz
Max.:	300.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	600	Data Type:	UInt16
Default:	100	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	Hz
Max.:	300.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	600	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0% to 600%

Description

Adjust this parameter based on the actual compensation effect.

H08.62 Position loop integral time constant

Address:	-	Effective Time:	Real time
Min.:	0.15	Unit:	-

Max.:	512.00	Data Type:	UInt16
Default:	512.00	Change:	Immediately

Value Range:

0.15–512.00

Description

Defines the position loop integral time constant.

H08.63 2nd position loop integral time constant

Address:	-	Effective Time:	Real time
Min.:	0.15	Unit:	-
Max.:	512.00	Data Type:	UInt16
Default:	512.00	Change:	Immediately

Value Range:

0.15–512.00

Description

Defines the 2nd position loop integral time constant.

H08.64 Speed observer feedback source

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled

1: Enabled

Description

-

H08.65 Zero deviation control selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled

1: Enabled

Description

Used to enable/disable zero deviation control.

H08.66 Zero deviation control position average filter

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	320.0	Data Type:	UInt16
Default:	5.0	Change:	Immediately

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.

H08.67 Low-pass filter for zero deviation control position

Commu-nication address:	-	Effective mode:	Real time
Min.:	0.0	Unit:	μs
Max.:	5120.0	Data type:	UInt16
Default:	190.0	Change mode:	Real time

Value range:

0.0 μs to 5120.0 μs

Description

Defines the low-pass filter time for zero deviation control position.

H08.68 Speed feedforward of zero deviation control

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:
0.0% to 100.0%
Description
Defines the torque feedforward of zero deviation control.

H08.71 Zero deviation control encoder delay

Communication address:	-	Effective mode:	Real time
Min.:	0.00	Unit:	μs
Max.:	512.00	Data type:	UInt16
Default:	31.25	Change mode:	Real time

Value range:
0.00 μs to 512.00 μs
Description
Defines the zero deviation control encoder delay.

H08.81 Anti-resonance frequency of dual-inertia model

Address:	-	Effective Time:	Real time
Min.:	1.0	Unit:	Hz
Max.:	400.0	Data Type:	UInt16
Default:	20.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	Hz
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.1	Unit:	-
Max.:	300.0	Data Type:	UInt16
Default:	60.0	Change:	Immediately

Value Range:

0.1–300.0

Description

Defines the dual-inertia model gain.

H08.84 Inertia ratio of dual-inertia model

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	120.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.00–120.00

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:

0.0–6553.5

Description

Set this parameter to 100% in general cases.

H08.89 Torque feedforward value of dual-inertia model

Address:	-	Effective Time:	Real time

Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:

0.0–6553.5

Description

Set this parameter to 100% in general cases.

5.10 H09 Auto-tuning Parameters

H09.00 Gain auto-tuning mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	4	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	41	Data Type:	UInt16
Default:	15	Change:	Immediately

Value Range:

0–41

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	3	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	Immediately

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:	-	Effective Time:	Real time
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 Max. speed of inertia auto-tuning

Address:	-	Effective Time:	Real time
Min.:	100	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	500	Change:	At stop

Value Range:
100rpm–1000rpm
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 max. speed during inertia auto-tuning

Address:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.00–100.00

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:

0.0% to 100.0%

Description

Defines the warning threshold for current feedback vibration.

H09.12 Frequency of the 1st notch

Address:	-	Effective Time:	Real time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

0–20

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–99

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:	-	Effective Time:	Real time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Immediately

Value Range:

50 Hz to 8000 Hz

Description
-

H09.16 Width level of the 2nd notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0–20
Description
-

H09.17 Depth level of the 2nd notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–99
Description
-

H09.18 Frequency of the 3rd notch

Address:	-	Effective Time:	Real time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Immediately

Value Range:
50 Hz to 8000 Hz
Description
-

H09.19 Width level of the 3rd notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

0–20
Description
-

H09.20 Depth level of the 3rd notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–99
Description
-

H09.21 Frequency of the 4th notch

Address:	-	Effective Time:	Real time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Immediately

Value Range:
50 Hz to 8000 Hz
Description
-

H09.22 Width level of the 4th notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0–20
Description
-

H09.23 Depth level of the 4th notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–99
Description
-

H09.24 Auto-tuned resonance frequency

Address:	-	Effective Time:	-
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:	-	Effective Time:	Real time
Min.:	50.0	Unit:	%
Max.:	500.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:
50.0% to 500.0%
Description
Defines ITune response capability. Increasing the setpoint improves the responsiveness but may incur resonance.

H09.27 ITune mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Disabled
1: ITune mode 1
2: ITune mode 2
Description
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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	80.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	1.0	Unit:	%
Max.:	120.0	Data Type:	UInt16
Default:	30.0	Change:	Immediately

Value Range:
1.0% to 120.0%
Description
-

H09.32 Gravity compensation value

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:
0.0% 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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%

Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:

0.0% to 100.0%

Description

Defines the forward friction compensation value.

H09.34 Negative friction compensation value

Address:	-	Effective Time:	Real time
Min.:	-100	Unit:	%
Max.:	0.0	Data Type:	Int16
Default:	0.0	Change:	Immediately

Value Range:

-100.0% to 0.0%

Description

Defines the reverse direction friction compensation value.

H09.35 Friction compensation speed

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-
Max.:	20.0	Data Type:	UInt16
Default:	2.0	Change:	Immediately

Value Range:

0.0-20.0

Description

Defines the friction compensation speed.

H09.36 Friction compensation speed

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	19	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Slow mode+Speed reference
1: Slow mode+Model speed
2: Slow mode+Speed feedback
3: Slow mode+Observe speed
16: Quick mode +Speed reference
17: Quick mode +Model speed
18: Quick mode +Speed feedback
19: Quick mode+Observe speed

Description

-

H09.37 Vibration monitoring time

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	600	Change:	Immediately

Value Range:

0–65535

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:	-	Effective Time:	Real time
Min.:	1.0	Unit:	Hz
Max.:	100.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0-3

Description

Defines different low-frequency resonance suppression types at the mechanical load. Type 1 features the shortest delay.

H09.41 Frequency of the 5th notch

Address:	-	Effective Time:	Real time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Immediately

Value Range:

50 Hz to 8000 Hz

Description

-

H09.42 Width level of the 5th notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0-20

Description

-

H09.43 Depth level of the 5th notch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0-99

Description

-

H09.44 Frequency of low-frequency resonance suppression 2 at mechanical load end

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-

Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:

0.0–100.0

Description

Set this parameter based on the actual jitter frequency.

H09.45 Responsiveness of low-frequency resonance suppression 2 at mechanical load end

Address:	-	Effective Time:	Real time
Min.:	0.01	Unit:	-
Max.:	5.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.01–5.00

Description

Use the default setpoint in general cases. To increase the setpoint, reduce the delay time.

H09.47 Width of low-frequency resonance suppression 2 at mechanical load end

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	2.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:

0.00–2.00

Description

Use the default setpoint in general cases. To increase the setpoint, increase the delay time.

H09.49 Frequency of low-frequency resonance suppression 3 at mechanical load end

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-
Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:

0.0–100.0

Description

-

H09.50 Responsiveness of low-frequency resonance suppression 3 at mechanical load end

Address:	-	Effective Time:	Real time
Min.:	0.01	Unit:	-
Max.:	5.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.01–5.00
Description
-

H09.52 Width of low-frequency resonance suppression 3 at mechanical load end

Address:	-	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	2.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.00–2.00
Description
-

H09.54 Vibration threshold

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	300.0	Data Type:	UInt16
Default:	50.0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	2936	Change:	Immediately

Value Range:
0–65535

Description

Defines the maximum overshoot value allowed during ETune adjustment.

H09.57 STune resonance suppression switchover frequency

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	4000	Data Type:	UInt16
Default:	900	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled

1: Enabled

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.

5.11 H0A Fault and Protection Parameters

H0A.00 Power input phase loss protection

Commu-nication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default:	0	Change mode:	Real time

Value range:

0: Enable
1: Disable

Description

Inovance provides servo drives of single-phase 220 V, three-phase 220 V, and three-phase 380 V. When the input voltage significantly fluctuates or phase loss occurs, the servo drive flexibly selects the protection mode based on the setting of H0A.00.

H0A.01 Absolute position limit

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled
1: Enabled
2: Enabled after homing

Description

Used to set the activation condition for enabling the software position limit function and the software limit.

H0A.04 Motor overload protection gain

Address:	-	Effective Time:	Real time
Min.:	50	Unit:	-
Max.:	300	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

50–300

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 increased by 50%. Set this parameter based on the actual temperature of the motor.

H0A.08 Overspeed threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm

Max.:	20000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0rpm–20000rpm

Description

Defines the overspeed threshold of the motor.

H0A.10 Threshold of excessive local position deviation

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	219895608	Change:	Immediately

Value Range:

0–4294967295

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: Disable

1: Enable

Description

Defines whether to enable runaway protection.

0: Disables E234.0 detection when the motor drives a vertical axis or is driven by the load

1: Enables runaway protection

H0A.18 IGBT over-temperature threshold

Address:	-	Effective Time:	Real time
Min.:	120	Unit:	℃
Max.:	175	Data Type:	UInt16
Default:	140	Change:	Immediately

Value Range:

120℃ to 175℃

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

Communication address:	-	Effective mode:	Real time
Min.:	0.00	Unit:	μs
Max.:	6.30	Data type:	UInt16
Default:	2.00	Change mode:	Real time

Value range:

0.00 μs to 6.30 μs

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

Communication address:	-	Effective mode:	Real time
Min.:	0.00	Unit:	μs
Max.:	6.30	Data type:	UInt16
Default:	2.00	Change mode:	Real time

Value range:

0.00 μs to 6.30 μs

Description

Defines the filter time of touch probe 2. An active input must last for the time defined by H0A.20.

H0A.22 Sigma_Delta filter time

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0-65535

Description

-

H0A.23 TZ signal filter time

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	25 ns
Max.:	31	Data Type:	UInt16
Default:	15	Change:	At stop

Value Range:
0 ns to 31 ns
Description
-

H0A.25 Speed display DO low-pass filter time

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	5000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 5000 ms
Description
Defines the low-pass filter time constant of the speed information for speed feedback and position references.

H0A.26 Motor overload detection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

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 Average filter time for speed display DO

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:
0 ms to 100 ms

Description

Defines the the average filter time constant of the speed information for speed feedback and position references.

H0A.32 Time threshold for over-temperature protection of stalled motors

Commu-nication address:	-	Effective mode:	Real time
Min.:	10	Unit:	ms
Max.:	65535	Data type:	UInt16
Default:	200	Change mode:	Real time

Value range:

10 ms to 65535 ms

Description

Defines the over-temperature 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 over-temperature detection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: Disabled

1: Enabled

Description

Enables or disables the detection for E630.0 (Motor stall overtemperature protection).

H0A.36 Encoder multi-turn overflow fault selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	15	Data Type:	UInt16
Default:	6	Change:	At stop

Value Range:

bit0: Overtravel compensation

0: Enabled

1: Disabled

bit1: Touch probe rising edge compensation

0: Disabled

1: Enabled

bit2: Touch probe falling edge compensation

0: Disabled

1: Enabled

bit3: Touch probe solution

0: New solution

1: Old solution (same as SV660N)

Description

-

H0A.41 Forward position of software position limit

Address:	-	Effective Time:	Real time
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 limit switch warning) and executes stop at forward limit.

H0A.43 Reverse position of software position limit

Address:	-	Effective Time:	Real time

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 warning E952.0 (Reverse limit switch warning) and executes stop at reverse limit.

H0A.49 Regenerative resistor overtemperature threshold

Address:	-	Effective Time:	Real time
Min.:	100	Unit:	℃
Max.:	175	Data Type:	UInt16
Default:	115	Change:	Immediately

Value Range:

100℃ to 175℃

Description

Defines the temperature threshold for regenerative resistor overload.

H0A.50 Encoder communication fault tolerance threshold

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	5	Change:	Immediately

Value Range:

0–31

Description

When the number 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:	-	Effective Time:	Real time
Min.:	3	Unit:	55 ms
Max.:	36	Data Type:	UInt16
Default:	20	Change:	Immediately

Value Range:

3 ms to 36 ms

Description

Phase loss fault is reported when phase loss keeps active for a period longer than H0A.51.

H0A.52 Encoder temperature protection threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	℃
Max.:	175	Data Type:	UInt16
Default:	105	Change:	Immediately

Value Range:

0℃ to 175℃

Description

Defines the temperature threshold for encoder overtemperature protection.

H0A.53 Probe DI ON compensation time

Address:	-	Effective Time:	Real time
Min.:	-3000	Unit:	25 ns
Max.:	3000	Data Type:	Int16
Default:	200	Change:	Immediately

Value Range:

-3000 ns to 3000 ns

Description

Used to compensate for the action time when the touch probe is switched on.

H0A.54 Probe DI OFF compensation time

Address:	-	Effective Time:	Real time
Min.:	-3000	Unit:	25 ns
Max.:	3000	Data Type:	Int16
Default:	1512	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	100.0	Unit:	%
Max.:	400.0	Data Type:	UInt16

Default: 200.0 Change: Immediately

Value Range:

100.0% to 400.0%

Description

Defines the current threshold for runaway protection detection.

H0A.56 Fault reset delay

Address: - Effective Time: Real time

Min.: 0 Unit: ms

Max.: 60000 Data Type: UInt16

Default: 10000 Change: Immediately

Value Range:

0 ms to 60000 ms

Description

-

H0A.57 Runaway speed threshold

Address: - Effective Time: Real time

Min.: 1 Unit: rpm

Max.: 1000 Data Type: UInt16

Default: 50 Change: Immediately

Value Range:

1rpm-1000rpm

Description

Defines the overspeed threshold for runaway protection detection.

H0A.58 Runaway speed filter time

Address: - Effective Time: Upon the next power-on

Min.: 0.1 Unit: ms

Max.: 100.0 Data Type: UInt16

Default: 2.0 Change: Immediately

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: - Effective Time: Real time

Min.:	10	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	30	Change:	Immediately

Value Range:

10 ms to 1000 ms

Description

The runaway fault will be reported when runaway keeps active for a period longer than H0A.59.

H0A.60 Black box function mode

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	1	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Immediately

Value Range:

0.0–6553.5

Description

Defines the fault code for triggering the black box function.

H0A.62 Trigger source

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	25	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–25

Description

Defines the fault code for triggering the black box function through designated channel.

H0A.63 Trigger level

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

Defines the trigger level for triggering the black box function through designated channel.

H0A.65 Trigger level

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Rising edge

1: Equal

2: Falling edge

3: Edge-triggered

Description

Defines the trigger mode for triggering the black box function through H0A.63.

H0A.66 Trigger position

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	75	Change:	Immediately

Value Range:

0% to 100%

Description

Defines the pre-trigger position for triggering black box sampling.

H0A.67 Sampling frequency

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	20000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0rpm–20000rpm

Description

Defines the speed threshold for reporting E500.2 (Position feedback pulse overspeed).

H0A.71 MS1 motor overload curve switchover

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	4098	Change mode:	Real time

Value range:

0 to 65535

Description

bit0: Overload curve selection switch

0: New overload curve

1: Old overload curve

bit1: Discharge switch upon power failure

0: Enable the discharge switch upon power failure

1: Hide the discharge switch upon power failure

bit4: Hide the alarm indicating that the power rating of the drive is too low to drive the motor switch
0: Not hide
: Hide
bit12: Enable retentive at power failure
0: Disable
1: Enable

H0A.72 Maximum stop time in ramp-to-stop

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	At stop

Value Range:
0 ms to 65535 ms
Description
Defines the time for the motor to decelerate from the maximum speed to 0rpm during ramp-to-stop.

H0A.73 STO 24 V disconnection filter time

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	ms
Max.:	5	Data Type:	UInt16
Default:	5	Change:	Immediately

Value Range:
1 ms to 5 ms
Description
Defines the delay from the moment when 24V is disconnected to the moment when the STO state applies.

H0A.74 Filter time for two inconsistent STO channels

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:
1 ms to 1000 ms
Description
Defines the delay from the moment the inconsistent 24V is input to the drive through two channels to the moment when the STO state applies.

H0A.75 Servo OFF delay after STO triggered

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	25	Data Type:	UInt16
Default:	20	Change:	Immediately

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.81 Enable voltage drop protection

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Host controller executes torque limit

2: Servo executes torque limit

Description

-

H0A.82 Voltage drop torque limit

Address:	-	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	Immediately

Value Range:

0.0% to 100.0%

Description

-

H0A.83 Torque limit cancel time

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0 ms to 1000 ms

Description

-

H0A.84 Instantaneous stop holding time

Address:	-	Effective Time:	Real time
Min.:	20	Unit:	ms
Max.:	50000	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:

20 ms to 50000 ms

Description

-

H0A.85 Wire breakage torque reference

Address:	-	Effective Time:	Real time
Min.:	4.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	5.0	Change:	At stop

Value Range:

4.0% to 400.0%

Description

-

H0A.86 Wire breakage detection filter time

Address:	-	Effective Time:	Real time
Min.:	5	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	30	Change:	At stop

Value Range:

5 ms to 1000 ms

Description

-

H0A.90 Moving average filter time for speed display values

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16

Default: 0 Change: Immediately

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: - Effective Time: Real time

Min.: 0 Unit: ms

Max.: 100 Data Type: UInt16

Default: 0 Change: Immediately

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: - Effective Time: Real time

Min.: 0 Unit: ms

Max.: 100 Data Type: UInt16

Default: 0 Change: Immediately

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: - Effective Time: Real time

Min.: 0 Unit: ms

Max.: 250 Data Type: UInt16

Default: 0 Change: Immediately

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: - Effective Time: Real time

Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 250 ms

Description

Defines the filter time constant for thermal display values.

5.12 H0b Monitoring Parameters

H0b.00 Motor speed actual value

Address:	-	Effective Time:	-
Min.:	-32767	Unit:	rpm
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767rpm to 32767rpm

Description

Indicates the round actual motor speed, 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:	-	Effective Time:	-
Min.:	-32767	Unit:	rpm
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767rpm to 32767rpm

Description

Indicates the present speed reference (accurate to 1rpm) of the drive in the position and speed control modes.

H0b.02 Internal torque reference

Address:	-	Effective Time:	-
Min.:	-500	Unit:	%
Max.:	500.0	Data Type:	Int16
Default:	0.0	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:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0-65535
Description
Displays the level status of eight DI terminals 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:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0-65535
Description
Displays the level status of 5 DO terminals 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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
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:	-	Effective Time:	-
Min.:	0.0	Unit:	°
Max.:	360.0	Data Type:	UInt16
Default:	0.0	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:	-	Effective Time:	-
Min.:	0.0	Unit:	°
Max.:	360.0	Data Type:	UInt16
Default:	0.0	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:	-	Effective Time:	-
Min.:	0.0	Unit:	%
Max.:	800.0	Data Type:	UInt16
Default:	0.0	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.15 Position following error (encoder unit)

Address:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648p to 2147483647p

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 clear when the condition defined in H05.16 (Clear action) is met.

H0b.17 Feedback pulse counter

Address:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648p to 2147483647p

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:	-	Effective Time:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0.0	Change:	Unchangeable

Value Range:

0.0s-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 Displayed AI1 voltage

Address:	-	Effective Time:	-
Min.:	-12	Unit:	V
Max.:	12.00	Data Type:	Int16
Default:	0.00	Change:	Unchangeable

Value Range:

-12.00 V to 12.00 V

Description

Displays the actual sampling voltage of AI1.

H0b.24 RMS value of phase current

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	A
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 A to 6553.5 A

Description

Displays the RMS value of the phase current of the motor, accurate to 0.01 A.

H0b.26 Bus voltage

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	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:	-	Effective Time:	-
Min.:	-20	Unit:	℃
Max.:	200	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-20℃ to 200℃

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:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0-65535

Description

-

H0b.29 Axis status information given by FPGA

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

Value Range:

0-65535

Description

-

H0b.30 Axis fault information given by FPGA

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

Value Range:

0-65535

Description

-

H0b.31 Encoder fault information

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

Value Range:

0-65535

Description

-

H0b.33 Fault log

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0-65535
Description
-

H0b.35 Time stamp upon occurrence of the selected fault

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0.0	Change:	Unchangeable

Value Range:
0.0s-429496729.5s
Description
-

H0b.37 Motor speed upon occurrence of the selected fault

Address:	-	Effective Time:	-
Min.:	-32767	Unit:	rpm
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:
-32767rpm to 32767rpm
Description
-

H0b.38 Motor phase U current upon occurrence of the selected fault

Address:	-	Effective Time:	-
Min.:	-3276.7	Unit:	A
Max.:	3276.7	Data Type:	Int16
Default:	0.0	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:	-	Effective Time:	-
Min.:	-3276.7	Unit:	A
Max.:	3276.7	Data Type:	Int16
Default:	0.0	Change:	Unchangeable

Value Range:
-3276.7 A to 3276.7 A
Description
-

H0b.40 Bus voltage upon occurrence of the selected fault

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:
0.0 V to 6553.5 V
Description
-

H0b.41 DI status upon occurrence of the selected fault

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

Value Range:
0–65535
Description
-

H0b.43 DO status upon occurrence of the selected fault

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

Value Range:
0–65535
Description
-

H0b.45 Internal fault code

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

Value Range:
0-65535
Description
-

H0b.46 Absolute encoder fault information given by FPGA upon occurrence of the selected fault

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

Value Range:
0-65535
Description
-

H0b.47 System status information given by FPGA upon occurrence of the selected fault

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

Value Range:
0-65535
Description
-

H0b.48 System fault information given by FPGA upon occurrence of the selected fault

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

Value Range:
0-65535

Description

-

H0b.49 Encoder fault information upon occurrence of the selected fault

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

Value Range:

0-65535

Description

-

H0b.51 Internal fault code upon occurrence of the selected fault

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

Value Range:

0-65535

Description

-

H0b.52 FPGA timeout fault standard bit upon occurrence of the selected fault

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

Value Range:

0-65535

Description

-

H0b.53 Position following error (reference unit)

Address:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	rpm
Max.:	2147483647.0	Data Type:	Int32
Default:	0.0	Change:	Unchangeable

Value Range:
-2147483648.0rpm to 2147483647.0rpm
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:	-	Effective Time:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
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:	-	Effective Time:	-
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 the NRD state.

H0b.66 Encoder temperature

Address:	-	Effective Time:	-
Min.:	-32768	Unit:	℃
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:
-32768℃ to 32767℃

Description

-

H0b.67 Load rate of regenerative resistor

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	%
Max.:	200.0	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0% to 200.0%

Description

-

H0b.70 Number of absolute encoder revolutions

Address:	-	Effective Time:	-
Min.:	0	Unit:	Rev
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0Rev–65535Rev

Description

Indicates the number of revolutions of the absolute encoder.

H0b.71 Single-turn position fed back by the absolute encoder

Address:	-	Effective Time:	-
Min.:	0	Unit:	p
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0p–2147483647p

Description

Displays the position feedback of the absolute encoder within one turn.

H0b.74 System fault information given by FPGA

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

Value Range:
0-65535
Description
-

H0b.77 Encoder position (low 32 bits)

Address:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
Description
Displays the low 32-bit value of the position feedback of the absolute encoder.

H0b.79 Encoder position (high 32 bits)

Address:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648p to 2147483647p
Description
Displays the low 32-bit value of the position feedback of the rotaty load when the absolute system works in the rotation mode.

H0b.83 Single-turn position of the rotary load (high 32 bits)

Address:	-	Effective Time:	-

Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648p to 2147483647p

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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648p to 2147483647p

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:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0-200

Description

-

H0b.90 Group No. of the abnormal parameter

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

Value Range:

0-65535

Description

-

H0b.91 Offset within the group of the abnormal parameter

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

Value Range:
0-65535
Description
-

H0b.94 Individual power-on time

Address:	-	Effective Time:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0.0	Change:	Unchangeable

Value Range:
0.0s-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:	-	Effective Time:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0.0	Change:	Unchangeable

Value Range:
0.0s-429496729.5s
Description
-

5.13 H0C Fault and Protection Parameters 2

H0C.71 Servo function switch

Hex:	200C-48h	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default:	0	Change mode:	Real time

Value range:
0 to 65535
Description
bit0: Reserved
bit1: Reserved
bit3: Reserved
bit4: Reserved
bit5: Reserved
bit7: Auto reset switch after the H0d.20 parameter is configured
0: disables auto reset
1: enables auto reset

5.14 H0d Auxiliary Function Parameters

H0d.00 Software Reset

Address:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
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, regardless of the servo drive status.

H0d.02 Inertia auto-tuning selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–65
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.03 Encoder initial angle auto-tuning

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: No operation
1: Enabled
Description
-

H0d.04 Read/write in encoder ROM

Address:	-	Effective Time:	Real time
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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: No operation

1: Emergency stop

Description

-

H0d.10 Auto-tuning of analog channel

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: AI1 adjustment

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:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

-

H0d.17 Forced DI/DO enable switch

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Forced DI enable switch

0: Disabled

1: Enabled

bit1: Forced DO enable switch

0: Disabled

1: Enabled

Description

Forced DI/DO selection.

H0d.18 Forced DI value

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:

0–255

Description

Defines whether the DI functions set in group H03 is active when forced DI is activated (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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	15	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–15

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: No operation
1 Reset
2: Reset the fault and multi-turn data
Description
You can reset the encoder error or the multi-turn data fed back by the encoder by setting H0d.20.

H0d.23 Torque fluctuation auto-tuning

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0-1
Description
-

5.15 H0E Communication Function Parameters

H0E.00 Node address

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:
1-127

Description

CAN 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

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	4	Data type:	UInt16
Default:	4	Change mode:	Real time

Value range:

0: Not save

1: Save parameters written through communication to EEPROM

2: Save object dictionaries written through communication to EEPROM

3: Save parameters and object dictionaries written through communication to EEPROM

4: Save object dictionaries written before communication (OP) to EEPROM

Description

You can use this parameter to select a data saving operation when parameters and object dictionaries are written through a serial port or SDO.

H0E.15 Select group 6000 index (last 2 bits)

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:

0–255

Description

Sets the index.

H0E.16 Select group 6000 sub-index

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–2

Description
Sets the sub-index.

H0E.20 EtherCAT slave name

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

Value Range:
0-65535
Description
-

H0E.21 EtherCAT slave alias

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0-65535
Description
-

H0E.22 Number of synchronous loss events allowed by EtherCAT

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	8	Change:	Immediately

Value Range:
1-20
Description
-

H0E.24 Number of SYNC loss events

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

Value Range:

0-65535
Description
-

H0E.25 Max. error value and invalid frames of EtherCAT port 0 per unit time

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

Value Range:
0-65535
Description
-

H0E.26 Max. error value and invalid frames of EtherCAT port 1 per unit time

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

Value Range:
0-65535
Description
-

H0E.27 Max. transfer error of EtherCAT port per unit time

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

Value Range:
0-65535
Description
-

H0E.28 Max. EtherCAT data frame processing unit error per unit time

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16

Default:	0	Change:	Unchangeable

Value Range:
0–255
Description
-

H0E.29 Max. link loss value of EtherCAT port 0 per unit time

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

Value Range:
0–65535
Description
-

H0E.31 EtherCAT synchronization mode setting

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:
0–2
Description
-

H0E.32 EtherCAT synchronization error threshold

Address:	-	Effective Time:	Real time
Min.:	100	Unit:	ns
Max.:	4000	Data Type:	UInt16
Default:	3000	Change:	At stop

Value Range:
100 ns to 4000 ns
Description
-

H0E.33 EtherCAT state machine status and port connection status

Address:	-	Effective Time:	-

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

Value Range:

0-65535

Description

Displays the connection status of the servo state machine and EtherCAT network ports.

bit	Setpoint
0-7	Correspond to EtherCAT state machines: 1/2/4/8
8-15	Correspond to terminal connection state: • 0: No link • 1: IN port linked • 2: OUT port linked • 3: IN and OUT ports linked

H0E.34 Excessive CSP position command increment count

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	30	Data Type:	UInt16
Default:	20	Change:	Immediately

Value Range:

1-30

Description

-

H0E.35 AL fault code

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

Value Range:

0-65535

Description

-

H0E.36 EtherCAT enhanced link selection

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-

Max.: 1
Default: 0
Data Type: UInt16
Change: Immediately

Value Range:
0: Disabled
1: Enabled

Description
-

H0E.37 EtherCAT XML reset selection

Address: -
Effective Time: Upon the next power-on
Min.: 0
Unit: -
Max.: 1
Data Type: UInt16
Default: 0
Change: Immediately

Value Range:
0: Disabled
1: Enabled

Description
-

H0E.80 Modbus baud rate

Address: -
Effective Time: Real time
Min.: 0
Unit: -
Max.: 9
Data Type: UInt16
Default: 9
Change: Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	3	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	20	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 20 ms

Description

Defines the delay from the moment when the slave receives a command from the host controller to the moment when the slave returns a response.

H0E.83 Modbus communication timeout

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	600	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 600 ms

Description

-

H0E.84 Sequence of Modbus communication data bits

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

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 ESC version

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00–655.35

Description

-

H0E.93 PHY type

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00–655.35

Description

-

H0E.96 XML version information

Address:	-	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00-655.35
Description
-

5.16 H18 Position Comparison Output

H18.00 Position comparison output selection

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Disable
1: Enable (rising edge-triggered)
Description
-

H18.01 Position comparison output feedback source

Address:	-	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Motor encoder feedback
Description
-

H18.02 Position comparison resolution

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	1	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Individual comparison mode
1: Cyclic comparison mode
2: Fixed cyclic comparison mode

Description

-

H18.04 Current position as zero

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disable
1: Enable (rising edge-triggered)

Description

-

H18.05 Position comparison output width

Address:	-	Effective Time:	Real time
Min.:	0.1	Unit:	ms
Max.:	204.7	Data Type:	UInt16
Default:	0.1	Change:	Immediately

Value Range:
0.1 ms to 204.7 ms
Description
Defines the active pulse width of the DO when the comparison point is reached. The value range is 0 to 204.7 (unit: 1 ms).

H18.07 Start point of position comparison

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	40	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–40
Description
-

H18.08 End point of position comparison

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	40	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–40
Description
-

H18.09 Current state of position comparison

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1024	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0–1024
Description
-

H18.10 Real-time position of position comparison

Address:	-	Effective Time:	Real time

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:
-2147483648-2147483647
Description
-

H18.12 Zero offset of position comparison

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648-2147483647
Description
-

H18.14 Position comparison output delay compensation

Commu-nication address:	-	Effective mode:	Upon the next power-on
Min.:	-12	Unit:	μs
Max.:	12.00	Data type:	Int16
Default:	0.00	Change mode:	Real time

Value range:
-12.00 μs to 12.00 μs
Description
Compensates the delay caused by hardware signal output.

H18.15 Fixed cyclic comparison

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
1-65535
Description
-

H18.17 Number of fixed mode cycles

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

Value Range:
0-65535
Description
-

5.17 H19 Target Position Parameters

H19.00 Target value of position comparison 1

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648-2147483647
Description
-

H19.02 Attribute value of position comparison 1

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

Attribute setting of position comparison point 1
Bit0: Current position changes from "less than" to "more than" the comparison point
Bit1: Current position changes from "more than" to "less than" the comparison point
Bit2 to 6: N/A
Bit7: DO1 output
Bit8: DO2 output
Bit9: DO3 output
Bit10: DO4 output
Bit11: N/A
Bit12: N/A
Bit13: N/A
Bit14: N/A
Bit15: N/A

H19.03 Target value of position comparison 2

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.05 Attribute value of position comparison 2

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: DO3 output

bit10: DO4 output

bit11: N/A

bit12: N/A

bit13: N/A

bit14: N/A

bit15: N/A

Description

See H19.02.

H19.06 Target value of position comparison 3

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

-

H19.08 Attribute value of position comparison 3

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: DO3 output

bit10: DO4 output

bit11: N/A

bit12: N/A

bit13: N/A

bit14: N/A

bit15: N/A

Description

See H19.02.

H19.09 Target value of position comparison 4

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.11 Attribute value of position comparison 4

Address:	-	Effective Time:	Real time

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

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: DO3 output

bit10: DO4 output

bit11: N/A

bit12: N/A

bit13: N/A

bit14: N/A

bit15: N/A

Description

See H19.02.

H19.12 Target value of position comparison 5

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

-

H19.14 Attribute value of position comparison 5

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A
Description
See H19.02.

H19.15 Target value of position comparison 6

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648-2147483647
Description
-

H19.17 Attribute value of position comparison 6

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.18 Target value of position comparison 7

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.20 Attribute value of position comparison 7

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.21 Target value of position comparison 8

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.23 Attribute value of position comparison 8

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.24 Target value of position comparison 9

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.26 Attribute value of position comparison 9

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.27 Target value of position comparison 10

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.29 Attribute value of position comparison 10

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.30 Target value of position comparison 11

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.32 Attribute value of position comparison 11

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.33 Target value of position comparison 12

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.35 Attribute value of position comparison 12

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.36 Target value of position comparison 13

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.38 Attribute value of position comparison 13

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.39 Target value of position comparison 14

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

-

H19.41 Attribute value of position comparison 14

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.42 Target value of position comparison 15

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

-

H19.44 Attribute value of position comparison 15

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.45 Target value of position comparison 16

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.47 Attribute value of position comparison 16

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.48 Target value of position comparison 17

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.50 Attribute value of position comparison 17

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.51 Target value of position comparison 18

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.53 Attribute value of position comparison 18

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.54 Target value of position comparison 19

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.56 Attribute value of position comparison 19

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.57 Target value of position comparison 20

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.59 Attribute value of position comparison 20

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.60 Target value of position comparison 21

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.62 Attribute value of position comparison 21

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.63 Target value of position comparison 22

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.65 Attribute value of position comparison 22

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.66 Target value of position comparison 23

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.68 Attribute value of position comparison 23

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.69 Target value of position comparison 24

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.71 Attribute value of position comparison 24

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.72 Target value of position comparison 25

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.74 Attribute value of position comparison 25

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.75 Target value of position comparison 26

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.77 Attribute value of position comparison 26

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.78 Target value of position comparison 27

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.80 Attribute value of position comparison 27

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.81 Target value of position comparison 28

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.83 Attribute value of position comparison 28

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.84 Target value of position comparison 29

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.86 Attribute value of position comparison 29

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.87 Target value of position comparison 30

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.89 Attribute value of position comparison 30

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.90 Target value of position comparison 31

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.92 Attribute value of position comparison 31

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.93 Target value of position comparison 32

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.95 Attribute value of position comparison 32

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.96 Target value of position comparison 33

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.98 Attribute value of position comparison 33

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.99 Target value of position comparison 34

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.101 Attribute value of position comparison 34

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.102 Target value of position comparison 35

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.104 Attribute value of position comparison 35

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.105 Target value of position comparison 36

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.107 Attribute value of position comparison 36

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.108 Target value of position comparison 37

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.110 Attribute value of position comparison 37

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.111 Target value of position comparison 38

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

-

H19.113 Attribute value of position comparison 38

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.114 Target value of position comparison 39

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648~2147483647

Description

-

H19.116 Attribute value of position comparison 39

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

H19.117 Target value of position comparison 40

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648-2147483647

Description

-

H19.119 Attribute value of position comparison 40

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: DO3 output
bit10: DO4 output
bit11: N/A
bit12: N/A
bit13: N/A
bit14: N/A
bit15: N/A

Description

See H19.02.

5.18 H1F Software Tool Parameters

H1F.90 DI function state 1 read through communication

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

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:	-	Effective Time:	Real time

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

Value Range:

0-65535

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0-65535

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0-65535

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0-65535

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0-65535

Description

Bit 0 corresponds to DO function 17.

Bit 1 corresponds to DO function 18.

Bit 2 corresponds to DO function 19.

…

By analogy

5.19 H30 Related Variables Read through Communication

H30.00 Servo status read through communication

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

Value Range:

0-65535

Description

-

H30.01 DO function state 1 read through communication

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

Value Range:

0-65535

Description

Bit 0 corresponds to DO function 1.
Bit 1 corresponds to DO function 2.
Bit 2 corresponds to DO function 3.
…
By analogy

H30.02 DO function state 2 read through communication

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

Value Range:

0-65535

Description

Bit 0 corresponds to DO function 17.
Bit 1 corresponds to DO function 18.
Bit 2 corresponds to DO function 19.
…
By analogy

5.20 H31 References Set Through Communication

H31.04 DO state set through communication

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0-65535

Description

Set H04.22 to define the DO state source by H31.04.

H31.05 AO set through communication

Address:	-	Effective Time:	Real time
Min.:	-10000	Unit:	mV
Max.:	10000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

-10000 mV to 10000 mV

Description

Set H04.50 to 10 to define AO through H31.05 (in mV).

H31.09 Speed reference set through communication

Address:	-	Effective Time:	Real time
Min.:	-9999	Unit:	rpm
Max.:	9999.000	Data Type:	Int32
Default:	0.000	Change:	Immediately

Value Range:

-9999.000rpm to 9999.000rpm

Description

Set H06.02 to 4 to define the speed reference in the speed control mode through H31.09 (unit: 0.001 rpm).

H31.11 Torque reference set through communication

Address:	-	Effective Time:	Real time
Min.:	-100	Unit:	%
Max.:	100.000	Data Type:	Int32
Default:	0.000	Change:	Immediately

Value Range:

-100.000% to 100.000%

Description

Set H07.02 to 4 to define the torque reference in the torque control mode through H31.11 (unit: 0.001%). The setpoint 100.000% corresponds to the rated torque of the motor.

5.21 1000h Object Dictionary

1000.00h Device type

Address:	-	Effective Time:	-

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

Value Range:
0-65535
Description
-

1001.00h Error Register

Address: -
Effective Time: -

Min.: 0
Max.: 255
Default: 0
Unit: -
Data Type: UInt16
Change: Unchangeable

Value Range:
0-255
Description
-

1018.01h Vendor ID

Address: -
Effective Time: -

Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt32
Change: Unchangeable

Value Range:
0-65535
Description
-

1018.02h Product Code

Address: -
Effective Time: -

Min.: 0
Max.: 65535
Default: 0
Unit: -
Data Type: UInt32
Change: Unchangeable

Value Range:
0-65535
Description
-

1018.03h Revision

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:
0-65535
Description
-

1600.00h Number of valid mapped objects in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	3	Change:	Immediately

Value Range:
0-20
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 Mapped object 1 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807040	Change:	Immediately

Value Range:
0-2147483647
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:
bit31 to bit16: index
bit15 to bit8: sub-index
bit7 to bit0: object length

1600.02h Mapped object 2 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1618608128	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.03h Mapped object 3 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1622671360	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.04h Mapped object 4 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.05h Mapped object 5 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.06h Mapped object 6 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.07h Mapped object 7 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.08h Mapped object 8 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.09h Mapped object 9 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1600.01h.

1600.0Ah Mapped object 10 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.0Bh Mapped object 11 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.0Ch Mapped object 12 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.0Dh Mapped object 13 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.0Eh Mapped object 14 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.0Fh Mapped object 15 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.10h Mapped object 16 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.11h Mapped object 17 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.12h Mapped object 18 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.13h Mapped object 19 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1600.14h Mapped object 20 in RPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1600.01h.

1A00.00h Number of valid mapping objects of TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	7	Change:	Immediately

Value Range:
0–20

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 Mapped object 1 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872576	Change:	Immediately

Value Range:

0–2147483647

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:

bit31 to bit16: index

bit15 to bit8: sub-index

bit7 to bit0: object length

1A00.02h Mapped object 2 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1617166336	Change:	Immediately

Value Range:

0–2147483647

Description

Same as 1A00.01h.

1A00.03h Mapped object 3 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1622736896	Change:	Immediately

Value Range:

0–2147483647

Description

Same as 1A00.01h.

1A00.04h Mapped object 4 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1622802432	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.05h Mapped object 5 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1622933504	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.06h Mapped object 6 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614741504	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.07h Mapped object 7 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1627193344	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.08h Mapped object 8 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.09h Mapped object 9 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.0A-h Mapped object 10 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647
Description
Same as 1A00.01h.

1A00.0B-h Mapped object 11 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-2147483647

Description
Same as 1A00.01h.

1A00.0Ch Mapped object 12 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.0Dh Mapped object 13 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.0Eh Mapped object 14 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.0Fh Mapped object 15 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.10h Mapped object 16 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.11h Mapped object 17 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.12h Mapped object 18 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.13h Mapped object 19 in TPDO1

Address:	-	Effective Time:	-
Min.:	0	Unit:	-

Max.: 2147483647 Data Type: UInt32
Default: 0 Change: Immediately
Value Range:
0–2147483647
Description
Same as 1A00.01h.

1A00.14h Mapped object 20 in TPDO1

Address: - Effective Time: -
Min.: 0 Unit: -
Max.: 2147483647 Data Type: UInt32
Default: 0 Change: Immediately
Value Range:
0–2147483647
Description
Same as 1A00.01h.

1C12.00h Number of assigned PDOs

Address: - Effective Time: -
Min.: 0 Unit: -
Max.: 2 Data Type: UInt8
Default: 1 Change: Immediately
Value Range:
0–2
Description
-

1C12.01h PDO mapping object index of assigned RxPDO1

Address: - Effective Time: -
Min.: 5632 Unit: -
Max.: 5898 Data Type: UInt16
Default: 0 Change: Immediately
Value Range:
5632–5898
Description
-

1C12.02h PDO mapping object index of assigned RxPDO2

Address: - Effective Time: -

Min.: 5632 Unit: -
Max.: 5898 Data Type: UInt16
Default: 0 Change: Immediately
Value Range:
5632-5898
Description
-

1C13.00h Number of assigned PDOs

Address: - Effective Time: -
Min.: 0 Unit: -
Max.: 2 Data Type: UInt8
Default: 0 Change: Immediately
Value Range:
0-2
Description
-

1C13.01h PDO mapping object index of assigned TxPDO1

Address: - Effective Time: -
Min.: 6656 Unit: -
Max.: 6922 Data Type: UInt16
Default: 0 Change: Immediately
Value Range:
6656-6922
Description
-

1C13.02h PDO mapping object index of assigned TxPDO1

Address: - Effective Time: -
Min.: 6656 Unit: -
Max.: 6922 Data Type: UInt16
Default: 0 Change: Immediately
Value Range:
6656-6922
Description
-

1C32.01h Sync mode

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0-65535
Description
-

1C32.02h Cycle time

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-4294967295
Description
-

1C32.04h Sync modes supported

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0-65535
Description
-

1C32.05h Minimum cycle time

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-4294967295
Description
-

1C33.01h Sync mode

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0-65535
Description
-

1C33.02h Cycle time

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-4294967295
Description
-

1C33.04h Sync modes supported

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0-65535
Description
-

1C33.05h Minimum cycle time

Address:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0-4294967295
Description
-

5.22 6000h Object Dictionary

Axis 2 object dictionary requires +0x800 offset.

Example: Axis 2 error code object dictionary: 603Fh + 0x800h = 683Fh

603Fh **Error code**

Communication address:	-	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default:	0	Change mode:	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 DS402.

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**

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default:	0	Change mode:	Real time

Value range:

0 to 65535

Description

For details about the status words, see section "Basic Functions of the Servo Drive" in the Function Guide.

6041h **Status word**

Communication address:	-	Effective mode:	-

Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

For details about the status words, see section "Basic Functions of the Servo Drive" in the Function Guide.

605Ah Quick stop option code

Address:	-	Effective Time:	Real time
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

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

605Ch Stop mode at S-ON OFF

Address:	-	Effective Time:	Real time
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: at zero speed, 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: Dynamic braking stop, keeping de-energized state

Description

-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 (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 status
2: Dynamic braking stop, keeping de-energized state

605Dh Stop option code

Address:	-	Effective Time:	Real time
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.
Defines the deceleration mode of the motor for stopping rotating upon halt and the motor status after stop.
PP/PV/HM mode:

Setpoint	Stop Mode
1	Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock status
2	Ramp to stop as defined by 6085h, keeping position lock status
3	Stop at emergency-stop torque, keeping position lock status

PT mode:

Setpoint	Stop Mode
1/2/3	Ramp to stop as defined by 6087h, keeping position lock status

605Eh Stop mode at No.2 fault

Address:	-	Effective Time:	Real time
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

-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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
8: CSP mode
9: CSV mode
10: CST mode

Description

Defines the servo drive operation mode.
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
8: CSP mode
9: CSV mode
10: CST mode
Other: 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:	-	Effective Time:	-
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
8: CSP mode
9: CSV mode
10: CST mode

Description

Indicates the actual operation mode.
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
8: CSP mode
9: CSV mode
10: CST mode

6062h Position reference

Address:	-	Effective Time:	-
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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	Encoder unit
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:	-	Effective Time:	-
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:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	219895608	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	46976	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

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:	-	Effective Time:	-
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:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:
0rpm-65535rpm
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:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
Defines the time window for speed reach, which must be used together with 606Dh.

606Fh Velocity threshold

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:
0rpm-65535rpm
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:	-	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

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.

6071h Target torque

Address:	-	Effective Time:	Real time
Min.:	-4000	Unit:	-
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:
-4000–4000
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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Immediately

Value Range:
0–4000
Description
Defines the maximum torque reference limit.
The value 1000 corresponds to the rated torque of the motor.

6074h Torque reference

Address:	-	Effective Time:	-
Min.:	-4000	Unit:	-
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:
-4000–4000
Description
Defines the target torque value.
The value 1000 corresponds to the rated torque of the motor.

6077h Torque actual value

Address:	-	Effective Time:	-
Min.:	-4000	Unit:	-
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-4000–4000

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:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

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:	-	Effective Time:	At stop
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

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 takes effect in the following conditions: The device is powered on, the homing operation is complete, and bit15 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.01h Min. position limit

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	-2147483648	Change:	Immediately

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.02h Max. position limit

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	2147483647	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0-127

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:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

Value Range:
0 to 4294967295
Description
Defines the maximum user running speed.
Set a proper gear ratio (8:1 recommended) when using a 26-bit encoder. Otherwise, the motor speed will be limited to 3840 RPM.

6081h Profile velocity

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	111848106	Change:	Immediately

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:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

Value Range:
0 to 4294967295
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 tup = Δ6081h/ Δ6083h = 1 (s); Deceleration time tdown = Δ6081h/ Δ6084h = 2 (s).
For 609Ah, the setpoint 0 will be forcibly changed to 1.

6084h Profile deceleration

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

Value Range:
0 to 4294967295
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 tup = Δ6081h/ Δ6083h = 1 (s); Deceleration time tdown = Δ6081h/ Δ6084h = 2 (s).
For 609Ah, the setpoint 0 will be forcibly changed to 1.

6085h Quick stop deceleration

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	2147483647	Change:	Immediately

Value Range:
0 to 4294967295
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.
For 609Ah, the setpoint 0 will be forcibly changed to 1.

6087h Torque slope

Address:	-	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

Value Range:

0–4294967295

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.
The setting value 0 will be forcibly changed into 1.

6091.01h Motor revolutions

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	1	Change:	At stop

Value Range:

1–4294967295

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 * 6091h * 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 * 6091h * 1000 / Encoder resolution / 60

6091.02h Shaft revolutions

Address:	-	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	1	Change:	At stop

Value Range:
1-4294967295
Description
Defines the denominator of the gear ratio.

6098h Homing method

Address:	-	Effective Time:	Real time
Min.:	-2	Unit:	-
Max.:	35	Data Type:	Int16
Default:	1	Change:	Immediately

Value Range:
-2-35
Description
Defines the homing method.
-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 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.
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 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.
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
17-32 are similar to 1-14 except that the deceleration point coincides with the home.
33 Reverse, Z signal as home.
34 Forward, Z signal as home.
Current position as the 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:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	111848106	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

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	Reference unit/s

Max.:	4294967295	Data type:	UInt32
Default:	11184810	Change mode:	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 a high speed, avoiding excessive deviation between the stop position and the specified mechanical home.

609Ah Homing acceleration

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

Value Range:
0 to 4294967295
Description
Defines the acceleration rate in the homing mode.

60B0h Position offset

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648 to 2147483647
Description
-

60B1h Velocity offset

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit/s
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648 to +2147483647
Description
-

60B2h Torque offset

Address:	-	Effective Time:	Real time
Min.:	-4000	Unit:	-
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

-4000–4000

Description

-

60B8h Touch probe function

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–65535

Description

Defines the functions of touch probe 1 and touch probe 2.

For absolute encoders, Z signal refers to the zero point of the single-turn position feedback.

See the following table for descriptions of each bit of 60B8.

bit	Description	Description
0	Touch probe 1 function selection 0: Disabled 1: Enabled	bit0 to bit5: settings related to touch probe 1 When a DI is used to trigger the touch probe function, the DI source is non-modifiable once the touch probe function is enabled. For an absolute encoder, Z signal refers to the zero point of the single-turn position feedback.
1	Touch probe 1 trigger mode: 0: Single trigger mode (Latches the position at the first trigger event.) 1: Continuous trigger mode	
2	Touch probe 1 trigger signal selection: 0: DI input signal 1: Z signal	
3	N/A	
4	Touch probe 1 positive edge 0: Latching at positive edge disabled 1: Latching at positive edge enabled	
5	Touch probe 1 negative edge 0: Latching at negative edge disabled 1: Latching at negative edge enabled	
6-7	N/A	bit8 to bit13: settings related to touch probe 2
8	Touch probe 2 function selection 0: Disabled 1: Enabled	
9	Touch probe 2 trigger mode: 0: Single trigger mode (Latches the position at the first trigger event.) 1: Continuous trigger mode	
10	Touch probe 2 trigger signal selection: 0: DI input signal 1: Z signal	
11	N/A	
12	Touch probe 2 positive edge: 0: Latching at positive edge disabled 1: Latching at positive edge enabled	
13	Touch probe 2 negative edge: 0: Latching at negative edge disabled 1: Latching at negative edge enabled	
14-15	N/A	-

60B9h Touch probe status

Communication address:	-	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default:	0	Change mode:	Unchangeable

Value range:
0 to 65535
Description
Indicates the status of touch probe 1 and touch probe 2.

Bit	Description	Description
0	Whether probe 1 is enabled: 0: Disabled 1: Enabled	bit0 to bit7: status of touch probe 1
1	Touch probe 1 positive edge value: 0: No positive edge value latched 1: Edge value latched	
2	Touch probe 1 negative edge value: 0: No negative edge value latched 1: Negative edge value latched	
3 to 5	N/A	-
6 to 7	The total number of times that the probe is triggered when the function of probe 1 is set for continuous sampling	The total number of times (0 to 3) that the probe is triggered when the function of probe 1 is set for continuous sampling
8	Whether probe 2 is enabled: 0: Disabled 1: Enabled	Bit8 to bit10: Status of probe 2
9	Touch probe 2 positive edge value: 0: No positive edge value latched 1: Edge value latched	
10	Touch probe 2 negative edge value: 0: No negative edge value latched 1: Negative edge value latched	

Bit	Description	Description
11 to 13	N/A	-
14 to 15	The total number of times that the probe is triggered when the function of probe 2 is set for continuous sampling	When the function of probe 2 is selected as continuous sampling, the total number of times (0–3) the probe is triggered

60BAh Touch probe 1 positive edge

Address:	-	Effective Time:	-
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:	-	Effective Time:	-
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:	-	Effective Time:	-
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:	-	Effective Time:	-
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.

60C5h Max. acceleration

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

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.

60C6h Max. deceleration

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

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:	-	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Unchangeable

Value Range:

0-65535

Description

The counting value is added by "1" each time this object is triggered.

60D6h Touch probe 1 negative edge counter

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

Value Range:

0-65535

Description

The counting value is added by "1" each time this object is triggered.

60D7h Touch probe 2 positive edge counter

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

Value Range:

0-65535

Description

The counting value is added by "2" each time this object is triggered.

60D8h Touch probe 2 negative edge counter

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

Value Range:

0-65535

Description

The counting value is added by "2" each time this object is triggered.

60E0h Positive torque limit value

Address:	-	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Immediately

Value Range:
0–4000
Description
Defines the maximum torque limit of the servo drive in the forward direction.

60E1h Negative torque limit value

Address:	-	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Immediately

Value Range:
0–4000
Description
Defines the maximum torque limit of the servo drive in the reverse direction.

60F4h Position deviation

Address:	-	Effective Time:	-
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:	-	Effective Time:	-
Min.:	-2147483648	Unit:	Encoder unit
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 status**

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data type:	UInt32
Default:	0	Change mode:	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 signal

0: Reverse overtravel signal active

1: Forward overtravel signal active

2: Home signal active

3 to 15: N/A

16: DI1 input active

17: DI2 input active

18: DI3 input active

19: DI4 input active

20: DI5 input active

21: DI6 input active

22: DI7 input active

23: DI8 input active

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 **PV, CSV mode speed reference**

Address:	-	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit/s
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648 to +2147483647

Description

Defines the target speed in the cyclic synchronous velocity mode/profile velocity mode.

60FE.01h Physical output

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data type:	UInt32
Default:	0	Change mode:	Real time

Value range:

0 to 4294967295

Description

Indicates the DO logic.

0: Inactive

1: Active

Description of bits:

0-15: N/A

16: DO1 forced output (0: off, 1: on), when bit16 of 60FE.02 is set to 1

17: DO2 forced output (0: off, 1: on), when bit17 of 60FE.02 is set to 1

18: DO3 forced output (0: off, 1: on), when bit18 of 60FE.02 is set to 1

19: DO4 forced output (0: off, 1: on), when bit17 of 60FE.02 is set to 1

20 to 25: N/A

26: P/PI switchover, only when bit26 of 60FE.02 is set to 1

27 to 31: N/A

60FE.02h Physical output enabling

Communication address:	-	Effective mode:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data type:	UInt32
Default:	0	Change mode:	Real time

Value range:

0 to 4294967295

Description

0 to 15: N/A
16: Enable forced DO1 output
17: Enable forced DO2 output
18: Enable forced DO3 output
19: Enable forced DO4 output
20 to 25: N/A
26: Enable P/PI switchover
27 to 31: N/A

6 List of Parameters

6.1 List of H00 Servo Motor Parameters

Parameter code	Hex	Parameter name	Value range	Default	Unit	Change mode	Page
H00.00	2000-01h	Motor SN	0 to 14101	14101	-	At stop	*"H00_en.00" on page 124*
H00.02	2000-03h	Customized No.	0.00 to 4294967295.00	0.00	-	Unchangeable	*"H00_en.02" on page 124*
H00.04	2000-05h	Encoder version	0.0 to 6553.5	0.0	-	Unchangeable	*"H00_en.04" on page 124*
H00.05	2000-06h	Serial-type motor code	0 to 65535	0	-	Unchangeable	*"H00_en.05" on page 125*
H00.06	2000-07h	FPGA customized code	0.00 to 655.35	0.00	-	Unchangeable	*"H00_en.06" on page 125*
H00.07	2000-08h	STO version	0.0 to 655.4	0.0	-	Unchangeable	*"H00_en.07" on page 125*
H00.08	2000-09h	Serial encoder type	0 to 65535	0	-	At stop	*"H00_en.08" on page 125*
H00.09	2000-0Ah	Rated voltage	0: 220 V 1: 380 V	0	-	At stop	*"H00_en.09" on page 126*
H00.10	2000-0Bh	Rated power	0.01 kW to 655.35 kW	0.75	kW	At stop	*"H00_en.10" on page 126*
H00.11	2000-0Ch	Rated current	0.01 A to 655.35 A	4.70	A	At stop	*"H00_en.11" on page 126*
H00.12	2000-0Dh	Rated torque	0.10 N·m to 655.35 N·m	2.39	N·m	At stop	*"H00_en.12" on page 126*
H00.13	2000-0Eh	Maximum torque	0.10 N·m to 655.35 N·m	7.16	N·m	At stop	*"H00_en.13" on page 127*
H00.14	2000-0Fh	Rated speed	100 RPM to 9999 RPM	3000	RPM	At stop	*"H00_en.14" on page 127*
H00.15	2000-10h	Maximum speed	100 RPM to 9999 RPM	6000	RPM	At stop	*"H00_en.15" on page 127*
H00.16	2000-11h	Moment of inertia	0.00000 kg/cm² to 655.35 kg/cm²	1.30	kg/cm^2	At stop	*"H00_en.16" on page 128*
H00.17	2000-12h	Number of PMSM pole pairs	2 to 65535	5	-	At stop	*"H00_en.17" on page 128*
H00.18	2000-13h	Stator resistance	0.001 Ω to 65.535 Ω	0.500	Ω	At stop	*"H00_en.18" on page 128*

Parameter code	Hex	Parameter name	Value range	Default	Unit	Change mode	Page
H00.19	2000-14h	Stator inductance Lq	0.01 mH to 655.35 mH	3.27	mH	At stop	"H00_en.19" on page 128
H00.20	2000-15h	Stator inductance Ld	0.01 mH to 655.35 mH	3.87	mH	At stop	"H00_en.20" on page 129
H00.21	2000-16h	Linear back EMF coefficient	0.01 mV/RPM to 655.35 mV/RPM	33.30	mV/RPM	At stop	"H00_en.21" on page 129
H00.22	2000-17h	Torque coefficient Kt	0.01 N·m/Arms to 655.35 N·m/Arms	0.51	N·m/Arms	At stop	"H00_en.22" on page 129
H00.23	2000-18h	Electrical constant Te	0.01 ms to 655.35 ms	6.54	ms	At stop	"H00_en.23" on page 129
H00.24	2000-19h	Mechanical constant Tm	0.01 ms to 655.35 ms	0.24	ms	At stop	"H00_en.24" on page 130
H00.28	2000-1Dh	Absolute encoder position offset	0 to 4294967295	8192	-	At stop	"H00_en.28" on page 130
H00.30	2000-1Fh	Encoder selection (HEX)	19: Inovance encoder	19	-	At stop	"H00_en.30" on page 130
H00.31	2000-20h	Encoder PPR	1 PPR to 1073741824 PPR	67108864	PPR	At stop	"H00_en.31" on page 130
H00.33	2000-22h	Electrical angle of Z signal	0.0° to 360.0°	180.0	°	At stop	"H00_en.33" on page 131
H00.34	2000-23h	Electrical angle of phase U rising edge	0.0° to 360.0°	180.0	°	At stop	"H00_en.34" on page 131
H00.35	2000-24h	Serial-type encoder model	0 to 65535	0	-	At stop	"H00_en.35" on page 131
H00.37	2000-26h	Absolute encoder function setting bit	0 to 65535	0	-	At stop	"H00_en.37" on page 131
H00.60	2000-3Dh	Motor attribute	0 to 65535	0	-	At stop	"H00_en.60" on page 132
H00.61	2000-3Eh	Brake close time	0 ms to 65535 ms	0	ms	At stop	"H00_en.61" on page 132
H00.62	2000-3Fh	Brake release time	0 ms to 65535 ms	0	ms	At stop	"H00_en.62" on page 132
H00.63	2000-40h	Maximum motor current	0.00 A to 65535.00 A	0.00	A	At stop	"H00_en.63" on page 133
H00.65	2000-42h	Rated motor current	0.00 A to 65535.00 A	0.00	A	At stop	"H00_en.65" on page 133
H00.67	2000-44h	Moment of inertia	0.00000 kg/cm² to 655.35 kg/cm²	0	kg/cm²	At stop	"H00_en.67" on page 133
H00.69	2000-46h	Linear back EMF coefficient	0.01 mV/RPM to 42949672.95 mV/RPM	0.00	mV/RPM	At stop	"H00_en.69" on page 133

Parameter code	Hex	Parameter name	Value range	Default	Unit	Change mode	Page
H00.71	2000-48h	Motor carrier frequency	0 Hz to 65535 Hz	8000	Hz	At stop	"H00_en.71" on page 134
H00.72	2000-49h	Maximum allowable motor demagnetization current	0% to 65535%	0	%	At stop	"H00_en.72" on page 134
H00.73	2000-4Ah	Bit01 of motor SN code	0 to 65535	0	-	At stop	"H00_en.73" on page 134
H00.74	2000-4Bh	Bit23 of motor SN code	0 to 65535	0	-	At stop	"H00_en.74" on page 134
H00.75	2000-4Ch	Bit45 of motor SN code	0 to 65535	0	-	At stop	"H00_en.75" on page 135
H00.76	2000-4Dh	Bit67 of motor SN code	0 to 65535	0	-	At stop	"H00_en.76" on page 135
H00.77	2000-4Eh	Bit89 of motor SN code	0 to 65535	0	-	At stop	"H00_en.77" on page 135
H00.78	2000-4Fh	Bit11 of motor SN code	0 to 65535	0	-	At stop	"H00_en.78" on page 135
H00.79	2000-50h	Bit13 of motor SN code	0 to 65535	0	-	At stop	"H00_en.79" on page 136
H00.80	2000-51h	Bit15 of motor SN code	0 to 65535	0	-	At stop	"H00_en.80" on page 136
H00.98	2000-63h	Motor attribute check	0 to 65535	0	-	At stop	"H00_en.98" on page 136

6.2 List of H01 Drive Parameters

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H01.00	2001-01h	MCU software version	0.0 to 6553.5	0.0	-	Unchangeable	"H01_en.00" on page 136
H01.01	2001-02h	FPGA software version	0.0 to 6553.5	0.0	-	Unchangeable	"H01_en.01" on page 137
H01.02	2001-03h	Servo drive series No.	0 to 65535	0	-	Unchangeable	"H01_en.02" on page 137
H01.07	2001-08h	Software test version	0.00 to 655.35	0.00	-	Unchangeable	"H01_en.07" on page 137

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H01.08	2001-09h	Model parameter version	0.0 to 6553.5	0.0	-	Unchangeable	"H01_en.08" on page 138
H01.10	2001-0Bh	Drive series No.	3: S2R8 5: S5R5	3	-	At stop	"H01_en.10" on page 138
H01.11	2001-0Ch	Inverter voltage class	0 V to 65535 V	220	V	Unchangeable	"H01_en.11" on page 138
H01.12	2001-0Dh	Drive rated power	0.00 kW to 10737418.24 kW	0.40	kW	Unchangeable	"H01_en.12" on page 138
H01.14	2001-0Fh	Maximum output power of the drive	0.00 kW to 10737418.24 kW	0.40	kW	Unchangeable	"H01_en.14" on page 139
H01.16	2001-11h	Rated output current of the drive	0.00 A to 10737418.24 A	2.80	A	Unchangeable	"H01_en.16" on page 139
H01.18	2001-13h	Maximum output current of the drive	0.00 A to 10737418.24 A	10.10	A	Unchangeable	"H01_en.18" on page 139
H01.20	2001-15h	Carrier frequency	4000 Hz to 20000 Hz	8000	Hz	At stop	"H01_en.20" on page 139
H01.21	2001-16h	Dead zone time	2.00μs to 20.00μs	2.00	μs	At stop	"H01_en.21" on page 140
H01.22	2001-17h	D-axis coupling voltage compensation coefficient	0.0% to 1000.0%	50.0	%	Real time	"H01_en.22" on page 140
H01.23	2001-18h	Q-axis back EMF compensation coefficient	0.0% to 1000.0%	50.0	%	Real time	"H01_en.23" on page 140
H01.24	2001-19h	D-axis current loop gain	0 Hz to 20000 Hz	500	Hz	Real time	"H01_en.24" on page 140
H01.25	2001-1Ah	D-axis current loop integral compensation factor	0.01 to 100.00	1.00	-	Real time	"H01_en.25" on page 141
H01.26	2001-1Bh	Sinc3 filter data extraction rate in current sampling	0: Extraction rate 32 1: Extraction rate 64 2: Extraction rate 128 3: Extraction rate 256	0	-	At stop	"H01_en.26" on page 141
H01.27	2001-1Ch	Q-axis current loop gain	0 Hz to 20000 Hz	500	Hz	Real time	"H01_en.27" on page 141

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H01.28	2001-1Dh	Q-axis current loop integral compensation factor	0.01 to 100.00	1.00	-	Real time	"H01_en.28" on page 142
H01.29	2001-1Eh	Q-axis coupling voltage compensation coefficient	0.0% to 1000.0%	50.0	%	Real time	"H01_en.29" on page 142
H01.30	2001-1Fh	Bus voltage gain adjustment	50.0% to 150.0%	100.0	%	At stop	"H01_en.30" on page 142
H01.31	2001-20h	Minimum ON time of bootstrap circuit lower bridge	0.0 μs to 20.0 μs	0.0	μs	At stop	"H01_en.31" on page 142
H01.32	2001-21h	Relative gain of UV sampling	1 to 65535	32768	-	At stop	"H01_en.32" on page 143
H01.34	2001-23h	Drive overtemperature threshold	0°C to 150°C	95	°C	Real time	"H01_en.34" on page 143
H01.36	2001-25h	Current sensor range	0.00 A to 9999.99 A	21.33	A	At stop	"H01_en.36" on page 143
H01.38	2001-27h	FPGA phase current protection threshold	0.0% to 100.0%	90.0	%	At stop	"H01_en.38" on page 144
H01.39	2001-28h	Current loop version	0 to 65535	0	-	At stop	"H01_en.39" on page 144
H01.40	2001-29h	DC bus overvoltage protection threshold	0 V to 2000 V	420	V	Real time	"H01_en.40" on page 144
H01.41	2001-2Ah	DC bus voltage discharge threshold	0 V to 2000 V	380	V	Real time	"H01_en.41" on page 144
H01.42	2001-2Bh	DC bus undervoltage threshold	0 V to 2000 V	200	V	Real time	"H01_en.42" on page 145
H01.52	2001-35h	D-axis proportional gain in performance priority mode	0 Hz to 20000 Hz	2000	Hz	Real time	"H01_en.52" on page 145

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H01.53	2001-36h	D-axis integral gain in performance priority mode	0.01 to 100.00	1.00	-	Real time	"H01_en.53" on page 145
H01.54	2001-37h	Q-axis proportional gain in performance priority mode	0 Hz to 20000 Hz	2000	Hz	Real time	"H01_en.54" on page 145
H01.55	2001-38h	Q-axis integral gain in performance priority mode	0.01 to 100.00	1.00	-	Real time	"H01_en.55" on page 146
H01.56	2001-39h	Current loop low-pass cutoff frequency	0 Hz to 65535 Hz	11000	Hz	At stop	"H01_en.56" on page 146
H01.59	2001-3Ch	Serial encoder data transmission compensation time	0.000 μs to 10.000 μs	0.000	μs	At stop	"H01_en.59" on page 146
H01.60	2001-3Dh	FPGA scheduling frequency selection	2: 8 kHz	2	-	At stop	"H01_en.60" on page 147
H01.61	2001-3Eh	Command scheduling frequency	0: 4 kHz 1: 2 kHz 2: 1 kHz	0	-	At stop	"H01_en.61" on page 147
H01.62	2001-3Fh	Automatic identification of drive model	0 to 65535	0	-	Unchangeable	"H01_en.62" on page 147
H01.66	2001-43h	Current loop configuration	0 kHz to 31 kHz	12	kHz	Real time	"H01_en.66" on page 147
H01.67	2001-44h	Deadzone compensation coefficient	0.00 to 2.00	1.00	-	Real time	"H01_en.67" on page 148
H01.68	2001-45h	Current observer cutoff frequency	200 to 5000	2000	-	Real time	"H01_en.68" on page 148
H01.69	2001-46h	Current observer calibration coefficient	0.00 to 9.00	1.00	-	Real time	"H01_en.69" on page 148
H01.72	2001-49h	Hide IGBT model identification	0 to 65535	0	-	Real time	"H01_en.72" on page 148

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H01.73	2001-4Ah	Sigma-delta signal phase compensation time	0 μs to 65535 μs	1	μs	At stop	*" H01_en.73" on page 149*
H01.75	2001-4Ch	Current loop amplification coefficient	0.00 to 655.35	1.00	-	Real time	*" H01_en.75" on page 149*
H01.78	2001-4Fh	Control circuit undervoltage threshold	0 V to 2000 V	200	V	Real time	*" H01_en.78" on page 149*
H01.79	2001-50h	Control voltage gain adjustment	50.0% to 150.0%	100.0	%	At stop	*" H01_en.79" on page 149*
H01.82	2001-53h	Filter time of PL and CPL	0 to 32767	4000	-	At stop	*" H01_en.82" on page 150*
H01.83	2001-54h	AO zero offset	-500 mV to 500 mV	0	mV	Real time	*" H01_en.83" on page 150*
H01.84	2001-55h	AO ratio	0.000 to 2000.000	1000.000	-	Real time	*" H01_en.84" on page 150*
H01.89	2001-5Ah	Junction temperature parameter version	0.000 to 65.535	0.000	-	Un changeable	*" H01_en.89" on page 151*

6.3 List of H02 Basic Control Parameters

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H02.00	2002-01h	Control mode	0: Velocity mode 1: Position mode 2: Torque mode 9: EtherCAT mode	9	-	At stop	*" H02_en.00" on page 151*
H02.01	2002-02h	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_en.01" on page 151*

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H02.02	2002-03h	Rotation direction	0: Counterclockwise (CCW) as forward direction 1: Clockwise (CW) as forward direction	0	-	At stop	*" H02_en.02" on page 152*
H02.05	2002-06h	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 (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: Dynamic braking stop, keeping de-energized state	0	-	Real time	*" H02_en.05" on page 152*

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H02.06	2002-07h	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 state1: 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	-	Real time	*" H02_en.06" on page 153*
H02.07	2002-08h	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: Ramp to stop as defined by 6085h, keeping de-energized state 4: Ramp to stop as defined by 6085h, 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_en.07" on page 154*

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H02.08	2002-09h	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_en.08" on page 154*
H02.09	2002-0Ah	Delay from brake output ON to command received	0 ms to 500 ms	250	ms	Real time	*" H02_en.09" on page 155*
H02.10	2002-0Bh	Delay from brake output OFF to motor de-energized	50 ms to 1000 ms	150	ms	Real time	*" H02_en.10" on page 155*
H02.11	2002-0Ch	Motor speed threshold at brake output OFF in rotation state	20 RPM to 3000 RPM	30	RPM	Real time	*" H02_en.11" on page 155*
H02.12	2002-0Dh	Delay from S-ON OFF to brake output OFF in rotation state	1 ms to 65535 ms	500	ms	Real time	*" H02_en.12" on page 156*
H02.15	2002-10h	LED warning display	0: Output alarm information immediately 1: Not output alarm information	0	-	Real time	*" H02_en.15" on page 156*
H02.16	2002-11h	Brake enable switch	0: OFF 1: ON	0	-	Real time	*" H02_en.16" on page 156*
H02.17	2002-12h	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	-	Real time	*" H02_en.17" on page 156*

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H02.18	2002-13h	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 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	-	Real time	" H02_en.18" on page 157
H02.20	2002-15h	Dynamic brake relay coil ON delay	10 ms to 30000 ms	30	ms	Real time	" H02_en.20" on page 157
H02.21	2002-16h	Permissible minimum resistance of braking resistor	1 Ω to 1000 Ω	40	Ω	Un changeable	" H02_en.21" on page 157
H02.22	2002-17h	Power of built-in regenerative resistor	0 W to 65535 W	50	W	Un changeable	" H02_en.22" on page 158
H02.23	2002-18h	Resistance of built-in regenerative resistor	0 Ω to 65535 Ω	50	Ω	Un changeable	" H02_en.23" on page 158
H02.24	2002-19h	Resistor heat dissipation coefficient	10% to 100%	30	%	Real time	" H02_en.24" on page 158
H02.25	2002-1Ah	Regenerative resistor type	0: Built-in 1: External, natural cooling 2: External, forced air cooling 3: No resistor needed	3	-	Real time	" H02_en.25" on page 159
H02.26	2002-1Bh	Power of external regenerative resistor	1 W to 65535 W	40	W	Real time	" H02_en.26" on page 159

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H02.27	2002-1Ch	Resistance of external regenerative resistor	15 Ω to 1000 Ω	50	Ω	Real time	" H02_en.27" on page 160
H02.30	2002-1Fh	User password	0 to 65535	0	-	Real time	" H02_en.30" on page 160
H02.31	2002-20h	System parameter initialization	0: No operation 1: Restore the default settings 2: Clear fault records	0	-	At stop	" H02_en.31" on page 160
H02.32	2002-21h	Selection of parameters in group H0b	0 to 99	50	-	Real time	" H02_en.32" on page 160
H02.35	2002-24h	Keypad data update frequency	0 Hz to 20 Hz	0	Hz	Real time	" H02_en.35" on page 161
H02.41	2002-2Ah	Manufacturer password	0 to 65535	0	-	Real time	" H02_en.41" on page 161
H02.47	2002-30h	Delayed brake closing time of power cable breakage	0 to 1000	10	-	Real time	" H02_en.47" on page 161

6.4 List of H03 Terminal Input Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H03.02	2003-03h	DI1 function	100: [Axis 1]Undefined 101: [Axis 1]Servo enable 102: [Axis 1]Alarm reset signal 114: [Axis 1]Positive limit switch 115: [Axis 1]Negative limit switch 131: [Axis 1]Home switch 134: [Axis 1]Emergency stop 138: [Axis 1]Touch probe 1 139: [Axis 1]Touch probe 2	114	-	Immediately	" H03_en.02" on page 162
H03.03	2003-04h	DI1 logic	0: Normally open 1: Closed	0	-	Immediately	" H03_en.03" on page 162

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H03.04	2003-05h	DI2 function	200: [Axis 2]Undefined 201: [Axis 2]Servo enable 202: [Axis 2]Alarm reset signal 214: [Axis 2]Positive limit switch 215: [Axis 2]Negative limit switch 231: [Axis 2]Home switch 234: [Axis 2]Emergency stop 238: [Axis 2]Touch probe 1 239: [Axis 2]Touch probe 2	214	-	Immediately	*" H03_en.04" on page 162*
H03.05	2003-06h	DI2 logic	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.05" on page 163*
H03.06	2003-07h	DI3 function	100: [Axis 1]Undefined 101: [Axis 1]Servo enable 102: [Axis 1]Alarm reset signal 114: [Axis 1]Positive limit switch 115: [Axis 1]Negative limit switch 131: [Axis 1]Home switch 134: [Axis 1]Emergency stop 138: [Axis 1]Touch probe 1 139: [Axis 1]Touch probe 2	115	-	Immediately	*" H03_en.06" on page 163*
H03.07	2003-08h	DI3 logic	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.07" on page 164*
H03.08	2003-09h	DI4 function	200: [Axis 2]Undefined 201: [Axis 2]Servo enable 202: [Axis 2]Alarm reset signal 214: [Axis 2]Positive limit switch 215: [Axis 2]Negative limit switch 231: [Axis 2]Home switch 234: [Axis 2]Emergency stop 238: [Axis 2]Touch probe 1 239: [Axis 2]Touch probe 2	215	-	Immediately	*" H03_en.08" on page 164*
H03.09	2003-0Ah	DI4 logic	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.09" on page 165*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H03.10	2003-0Bh	DI5 function	100: [Axis 1]Undefined 101: [Axis 1]Servo enable 102: [Axis 1]Alarm reset signal 114: [Axis 1]Positive limit switch 115: [Axis 1]Negative limit switch 131: [Axis 1]Home switch 134: [Axis 1]Emergency stop 138: [Axis 1]Touch probe 1 139: [Axis 1]Touch probe 2	131	-	Immediately	*" H03_en.10" on page 165*
H03.11	2003-0Ch	DI5 logic	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.11" on page 166*
H03.12	2003-0Dh	DI6 function	200: [Axis 2]Undefined 201: [Axis 2]Servo enable 202: [Axis 2]Alarm reset signal 214: [Axis 2]Positive limit switch 215: [Axis 2]Negative limit switch 231: [Axis 2]Home switch 234: [Axis 2]Emergency stop 238: [Axis 2]Touch probe 1 239: [Axis 2]Touch probe 2	231	-	Immediately	*" H03_en.12" on page 166*
H03.13	2003-0Eh	DI6 logic	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.13" on page 167*
H03.14	2003-0Fh	DI7 function	100: [Axis 1]Undefined 101: [Axis 1]Servo enable 102: [Axis 1]Alarm reset signal 114: [Axis 1]Positive limit switch 115: [Axis 1]Negative limit switch 131: [Axis 1]Home switch 134: [Axis 1]Emergency stop 138: [Axis 1]Touch probe 1 139: [Axis 1]Touch probe 2	138	-	Immediately	*" H03_en.14" on page 167*
H03.15	2003-10h	DI7 logic	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.15" on page 168*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H03.16	2003-11h	DI8 function selection	200: [Axis 2]Undefined 201: [Axis 2]Servo enable 202: [Axis 2]Alarm reset signal 214: [Axis 2]Positive limit switch 215: [Axis 2]Negative limit switch 231: [Axis 2]Home switch 234: [Axis 2]Emergency stop 238: [Axis 2]Touch probe 1 239: [Axis 2]Touch probe 2	238	-	Immediately	"H03_en.16" on page 168
H03.17	2003-12h	DI8 logic selection	0: Normally open 1: Closed	0	-	Immediately	"H03_en.17" on page 169
H03.50	2003-33h	Voltage-type AI1 offset	-5000 mV to 5000 mV	0	mV	Immediately	"H03_en.50" on page 169
H03.51	2003-34h	Voltage-type AI1 input filter time constant	0.00 ms to 655.35 ms	2.00	ms	Immediately	"H03_en.51" on page 169
H03.53	2003-36h	Voltage-type AI1 dead zone	0.0 mV to 1000.0 mV	10.0	mV	Immediately	"H03_en.53" on page 170
H03.54	2003-37h	Voltage-type AI1 zero drift	-500.0 mV to 500.0 mV	0.0	mV	Immediately	"H03_en.54" on page 170
H03.60	2003-3Dh	DI1 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.60" on page 170
H03.61	2003-3Eh	DI2 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.61" on page 171
H03.62	2003-3Fh	DI3 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.62" on page 171
H03.63	2003-40h	DI4 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.63" on page 171
H03.64	2003-41h	DI5 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.64" on page 172
H03.65	2003-42h	DI6 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.65" on page 172
H03.66	2003-43h	DI7 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.66" on page 172
H03.67	2003-44h	DI8 filter time	0.00 ms to 500.00 ms	0.50	ms	Immediately	"H03_en.67" on page 173

6.5 List of H04 Terminal Output Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H04.00	2004-01h	DO1 function selection	100: [Axis 1]Undefined 101: [Axis 1]Servo ready 102: [Axis 1]Motor rotation signal 109: [Axis 1] Braking output 110: [Axis 1] Warning 111: [Axis 1]Failure 125: [Axis 1]Comparison output 131:[Axis 1]Forced communication DO 132: [Axis 1]EDM output	101	-	Immediately	" H04_en.00" on page 173
H04.01	2004-02h	DO1 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.01" on page 173
H04.02	2004-03h	DO2 function selection	200: [Axis 2]Undefined 201: [Axis 2]Servo ready 202: [Axis 2]Motor rotation signal 209: [Axis 2] Braking output 210: [Axis 2] Warning 211: [Axis 2]Failure 225: [Axis 2]Comparison output 231:[Axis 2]Forced communication DO 232: [Axis 2]EDM output	201	-	Immediately	" H04_en.02" on page 174
H04.03	2004-04h	DO2 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.03" on page 175
H04.04	2004-05h	DO3 function selection	100: [Axis 1]Undefined 101: [Axis 1]Servo ready 102: [Axis 1]Motor rotation signal 109: [Axis 1] Braking output 110: [Axis 1] Warning 111: [Axis 1]Failure 125: [Axis 1]Comparison output 131:[Axis 1]Forced communication DO 132: [Axis 1]EDM output	109	-	Immediately	" H04_en.04" on page 175
H04.05	2004-06h	DO3 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.05" on page 175

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H04.06	2004-07h	DO4 function selection	200: [Axis 2]Undefined 201: [Axis 2]Servo ready 202: [Axis 2]Motor rotation signal 209: [Axis 2] Braking output 210: [Axis 2] Warning 211: [Axis 2]Failure 225: [Axis 2]Comparison output 231:[Axis 2]Forced communication DO 232: [Axis 2]EDM output	209	-	Immediately	"H04_en.06" on page 176
H04.07	2004-08h	DO4 logic selection	0: Normally open 1: Closed	0	-	Immediately	"H04_en.07" on page 176
H04.22	2004-17h	DO source selection	bit0: DO1 output source 0: DO1 function output 1: bit0 of H31.04 bit1: DO2 output source 0: DO2 function output 1: bit1 of H31.04 bit2: DO3 output source 0: DO3 function output 1: bit2 of H31.04 bit3: DO4 output source 0: DO4 function output 1: bit3 of H31.04	0	-	Immediately	"H04_en.22" on page 177
H04.23	2004-18h	ECAT 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	0	-	Immediately	"H04_en.23" on page 177
H04.50	2004-33h	AO1 signal selection	10: Defined by H31.05	0	-	Immediately	"H04_en.50" on page 178
H04.51	2004-34h	AO1 offset voltage	-10000 mV to 10000 mV	0	mV	Immediately	"H04_en.51" on page 178
H04.52	2004-35h	AO1 multiplier	-99.99 to 99.99	1.00	-	Immediately	"H04_en.52" on page 178

6.6 List of H05 Position Control Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H05.02	2005-03h	Pulses per revolution	0 PPR to 4294967295 PPR	0	PPR	At stop	"H05_en.02" on page 179
H05.04	2005-05h	First-order low-pass filter time constant	0.0 ms to 6553.5 ms	0.0	ms	At stop	"H05_en.04" on page 179
H05.06	2005-07h	Moving average filter time constant 1	0.0 ms to 128.0 ms	0.0	ms	At stop	"H05_en.06" on page 179
H05.07	2005-08h	Electronic gear ratio 1 (numerator)	1–1073741824	1	-	Immediately	"H05_en.07" on page 179
H05.09	2005-0Ah	Electronic gear ratio 1 (denominator)	1–1073741824	1	-	Immediately	"H05_en.09" on page 180
H05.16	2005-11h	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_en.16" on page 180
H05.19	2005-14h	Speed feedforward control	0: No speed feedforward 1: Internal speed feedforward 2: 60B1h 3: Zero phase	1	-	At stop	"H05_en.19" on page 180
H05.30	2005-1Fh	Homing selection	0: Disabled, 6: Current position	0	-	Immediately	"H05_en.30" on page 181
H05.35	2005-24h	Homing time limit	0 ms to 65535 ms	10000	ms	Immediately	"H05_en.35" on page 181
H05.36	2005-25h	Mechanical home offset	-2147483648 to 2147483647	0	Reference unit	Immediately	"H05_en.36" on page 182

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H05.40	2005-29h	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_en.40" on page 182*
H05.50	2005-33h	Mechanical gear ratio in absolute position rotation mode (numerator)	1 to 65535	1	-	At stop	*" H05_en.50" on page 182*
H05.51	2005-34h	Mechanical gear ratio in absolute position rotation mode (denominator)	1 to 65535	1	-	At stop	*" H05_en.51" on page 183*
H05.52	2005-35h	Pulses per revolution of the load in absolute position rotation mode (low 32 bits)	0 to 4294967295	0	Encoder unit	At stop	*" H05_en.52" on page 183*
H05.54	2005-37h	Pulses per revolution of the load in absolute position rotation mode (high 32 bits)	0 to 4294967295	0	Encoder unit	At stop	*" H05_en.54" on page 183*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H05.58	2005-3Bh	Torque threshold in homing upon hit-and-stop	0.0% to 400.0%	100.0	%	Immediately	"H05_en.58" on page 184
H05.60	2005-3Dh	Hold time of positioning completed	0 ms to 30000 ms	0	ms	Immediately	"H05_en.60" on page 184
H05.66	2005-43h	Homing time unit	0: 1 ms 1: 10 ms 2: 100 ms	2	-	At stop	"H05_en.66" on page 184
H05.67	2005-44h	Offset between zero point and single-turn absolute position	-2147483648 to 2147483647	0	Encoder unit	At stop	"H05_en.67" on page 184
H05.71	2005-48h	Motor Z signal width	1 ms to 100 ms	4	ms	Immediately	"H05_en.71" on page 185

6.7 List of H06 Speed Control Parameters

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H06.00	2006-01h	Source of main speed reference A	0: Digital setting (H06.03)	0	-	At stop	"H06_en.00" on page 185
H06.01	2006-02h	Source of auxiliary speed reference B	0: Digital setting (H06.03)	1	-	At stop	"H06_en.01" on page 185
H06.02	2006-03h	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_en.02" on page 186
H06.03	2006-04h	Speed reference set through keypad	-9999 RPM to +9999 RPM	200	RPM	Real time	"H06_en.03" on page 186

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H06.05	2006-06h	Acceleration ramp time of speed reference	0 ms to 65535 ms	0	ms	Real time	" H06_en.05" on page 186
H06.06	2006-07h	Deceleration ramp time of speed reference	0 ms to 65535 ms	0	ms	Real time	" H06_en.06" on page 187
H06.07	2006-08h	Maximum speed limit	0 RPM to 9999 RPM	6000	RPM	Real time	" H06_en.07" on page 187
H06.08	2006-09h	Forward speed threshold	0 RPM to 9999 RPM	6000	RPM	Real time	" H06_en.08" on page 187
H06.09	2006-0Ah	Reverse speed threshold	0 RPM to 9999 RPM	6000	RPM	Real time	" H06_en.09" on page 187
H06.10	2006-0Bh	Deceleration unit in emergency stop	0: Multiplied by 1 1: Multiplied by 10 2: Multiplied by 100	0	-	At stop	" H06_en.10" on page 188
H06.11	2006-0Ch	Torque feedforward control	0: No torque feedforward 1: Internal torque feedforward 2: 60B2h as external torque feedforward	1	-	Real time	" H06_en.11" on page 188
H06.12	2006-0Dh	Acceleration ramp time of jog speed	0 ms to 65535ms	10	ms	Real time	" H06_en.12" on page 189
H06.13	2006-0Eh	Speed feedforward smoothing filter	0 μs to 65535 μs	0	μs	Real time	" H06_en.13" on page 190
H06.15	2006-10h	Zero clamp speed threshold	0 RPM to 9999 RPM	10	RPM	Real time	" H06_en.15" on page 190
H06.16	2006-11h	Threshold of TGON (motor rotation) signal	0 RPM to 1000 RPM	20	RPM	Real time	" H06_en.16" on page 190
H06.17	2006-12h	Threshold of V-Cmp (speed matching) signal	0 RPM to 100 RPM	10	RPM	Real time	" H06_en.17" on page 191
H06.18	2006-13h	Threshold of speed reach signal	20 RPM to 9999 RPM	1000	RPM	Real time	" H06_en.18" on page 191
H06.19	2006-14h	Threshold of zero speed output signal	1 RPM to 9999 RPM	10	RPM	Real time	" H06_en.19" on page 191

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H06.26	2006-1Bh	Torque fluctuation auto-tuning	0 to 1	0	-	Real time	" H06_en.26" on page 191
H06.28	2006-1Dh	Cogging torque ripple compensation	0 to 1	1	-	At stop	" H06_en.28" on page 192
H06.31	2006-20h	Sine reference frequency	0 to 16000	50	-	Real time	" H06_en.31" on page 192
H06.32	2006-21h	Sine reference amplitude	0 to 30000	30	-	Real time	" H06_en.32" on page 192
H06.33	2006-22h	Enable sine reference	0 to 3	0	-	Real time	" H06_en.33" on page 192
H06.34	2006-23h	Sine reference initial phase	0.0 to 360.0	0.0	-	Real time	" H06_en.34" on page 193
H06.35	2006-24h	Sine reference offset	-9900 to 9900	0	-	Real time	" H06_en.35" on page 193
H06.50	2006-33h	Speed S-curve switch	0: Disable 1: Enable	0	-	At stop	" H06_en.50" on page 193
H06.51	2006-34h	Increasing acceleration of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06_en.51" on page 194
H06.52	2006-35h	Decreasing acceleration of speed S-curve acceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06_en.52" on page 194
H06.53	2006-36h	Decreasing deceleration of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06_en.53" on page 194
H06.54	2006-37h	Decreasing acceleration of speed S-curve deceleration segment	0.0% to 100.0%	50.0	%	At stop	" H06_en.54" on page 194

6.8 List of H07 Torque Control Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H07.00	2007-01h	Source of main torque reference A	0: Keypad (H07.03)	0	-	At stop	*"H07_en.00" on page 195*
H07.01	2007-02h	Source of auxiliary torque reference B	0: Keypad (H07.03)	1	-	At stop	*"H07_en.01" on page 195*
H07.02	2007-03h	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_en.02" on page 195*
H07.03	2007-04h	Torque reference set through keypad	-400.0% to 400.0%	0.0	%	Immediately	*"H07_en.03" on page 195*
H07.05	2007-06h	Torque reference filter time constant 1	0.00 ms to 30.00 ms	0.50	ms	Immediately	*"H07_en.05" on page 196*
H07.06	2007-07h	Torque reference filter time constant 2	0.00 ms to 30.00 ms	0.27	ms	Immediately	*"H07_en.06" on page 196*
H07.07	2007-08h	Torque limit source	0: FWD/REV internal torque limit	0	-	Immediately	*"H07_en.07" on page 196*
H07.09	2007-0Ah	Positive internal torque limit	0.0% to 400.0%	350.0	%	Immediately	*"H07_en.09" on page 197*
H07.10	2007-0Bh	Negative internal torque limit	0.0% to 400.0%	350.0	%	Immediately	*"H07_en.10" on page 197*
H07.11	2007-0Ch	Positive external torque limit	0.0% to 400.0%	350.0	%	Immediately	*"H07_en.11" on page 197*
H07.12	2007-0Dh	Negative external torque limit	0.0% to 400.0%	350.0	%	Immediately	*"H07_en.12" on page 197*
H07.15	2007-10h	Emergency-stop torque	0.0% to 400.0%	100.0	%	Immediately	*"H07_en.15" on page 198*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H07.17	2007-12h	Speed limit source	0: Internal speed limit	0	-	Immediately	"H07_en.17" on page 198
H07.19	2007-14h	Positive speed limit/Speed limit 1 in torque control	0rpm-9999rpm	3000	rpm	Immediately	"H07_en.19" on page 198
H07.20	2007-15h	Negative speed limit/ Speed limit 2 in torque control	0rpm-9999rpm	3000	rpm	Immediately	"H07_en.20" on page 198
H07.21	2007-16h	Base value for torque reach	0.0% to 400.0%	0.0	%	Immediately	"H07_en.21" on page 199
H07.22	2007-17h	Torque reach valid value	0.0% to 400.0%	20.0	%	Immediately	"H07_en.22" on page 199
H07.23	2007-18h	Torque reach invalid value	0.0% to 400.0%	10.0	%	Immediately	"H07_en.23" on page 199
H07.24	2007-19h	Field weakening depth	60% to 115%	115	%	Immediately	"H07_en.24" on page 199
H07.25	2007-1Ah	Max. permissible demagnetizing current	0% to 300%	100	%	Immediately	"H07_en.25" on page 200
H07.26	2007-1Bh	Field weakening selection	0: Disabled 1: Enabled	0	-	At stop	"H07_en.26" on page 200
H07.27	2007-1Ch	Flux weakening gain	0.001 Hz to 1.000 Hz	0.030	Hz	Immediately	"H07_en.27" on page 200
H07.28	2007-1Dh	Speed of field weakening point	0-65535	0	-	Unchangeable	"H07_en.28" on page 200
H07.35	2007-24h	Motor torque output correction	0: Disabled 1: Enabled	0	-	At stop	"H07_en.35" on page 201
H07.36	2007-25h	Time constant of low-pass filter 2	0.00 ms to 10.00 ms	0.00	ms	Immediately	"H07_en.36" on page 201
H07.37	2007-26h	Torque reference filter selection	0: First-order filter 1: Biquad filter	0	-	Immediately	"H07_en.37" on page 201

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H07.38	2007-27h	Biquad filter attenuation ratio	0-50	16	-	At stop	" H07_en.38" on page 201
H07.40	2007-29h	Speed limit window in the torque control mode	0 ms to 300 ms	10	ms	Immediately	" H07_en.40" on page 202

6.9 List of H08 Gain Parameters

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H08.00	2008-01h	Speed loop gain	0.1 Hz to 2000.0 Hz	40.0	Hz	Real time	" H08_en.00" on page 202
H08.01	2008-02h	Speed loop integral time constant	0.15 ms to 512.00 ms	19.89	ms	Real time	" H08_en.01" on page 202
H08.02	2008-03h	Position loop gain	0.1 Hz to 2000.0 Hz	64.0	Hz	Real time	" H08_en.02" on page 203
H08.03	2008-04h	2nd speed loop gain	0.1 Hz to 2000.0 Hz	75.0	Hz	Real time	" H08_en.03" on page 203
H08.04	2008-05h	2nd speed loop integral time constant	0.15 ms to 512.00 ms	10.61	ms	Real time	" H08_en.04" on page 203
H08.05	2008-06h	2nd position loop gain	0.1 Hz to 2000.0 Hz	120.0	Hz	Real time	" H08_en.05" on page 204
H08.08	2008-09h	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	-	Real time	" H08_en.08" on page 204

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H08.09	2008-0Ah	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	-	Real time	*" H08_en.09" on page 204*
H08.10	2008-0Bh	Gain switchover delay	0.0 ms to 1000.0 ms	5.0	ms	Real time	*" H08_en.10" on page 205*
H08.11	2008-0Ch	Gain switchover level	0 to 20000	50	-	Real time	*" H08_en.11" on page 205*
H08.12	2008-0Dh	Gain switchover hysteresis	0 to 20000	30	-	Real time	*" H08_en.12" on page 205*
H08.13	2008-0Eh	Position gain switchover time	0.0 ms to 1000.0 ms	3.0	ms	Real time	*" H08_en.13" on page 206*
H08.15	2008-10h	Load moment of inertia ratio	0.00 to 120.00	1.00	-	Real time	*" H08_en.15" on page 206*
H08.16	2008-11h	ITune parameter saving	0 to 65535	0	-	Real time	*" H08_en.16" on page 207*
H08.17	2008-12h	Zero phase delay	0.0 ms to 4.0 ms	0.0	ms	Real time	*" H08_en.17" on page 207*
H08.18	2008-13h	Time constant of speed feedforward filter	0.00 ms to 64.00 ms	0.50	ms	Real time	*" H08_en.18" on page 207*
H08.19	2008-14h	Speed feedforward gain	0.0% to 100.0%	0.0	%	Real time	*" H08_en.19" on page 207*

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H08.20	2008-15h	Torque feedforward filter time constant	0.00 ms to 64.00 ms	0.50	ms	Real time	" H08_en.20" on page 208
H08.21	2008-16h	Torque feedforward gain	0.0% to 300.0%	0.0	%	Real time	" H08_en.21" on page 208
H08.22	2008-17h	Speed feedback filtering option	0: Inhibited 1: 2 times 2: 4 times 3: 8 times 4: 16 times	0	-	At stop	" H08_en.22" on page 209
H08.23	2008-18h	Cutoff frequency of speed feedback low-pass filter	100 Hz to 8000 Hz	8000	Hz	Real time	" H08_en.23" on page 209
H08.24	2008-19h	PDFF control coefficient	0.0% to 200.0%	100.0	%	Real time	" H08_en.24" on page 210
H08.27	2008-1Ch	Speed observer cutoff frequency	50 Hz to 600 Hz	170	Hz	Real time	" H08_en.27" on page 210
H08.28	2008-1Dh	Speed observer inertia correction coefficient	1% to 1600%	100	%	Real time	" H08_en.28" on page 210
H08.29	2008-1Eh	Speed observer filter time	0.00 ms to 10.00 ms	0.80	ms	Real time	" H08_en.29" on page 211
H08.30	2008-1Fh	Disturbance compensation time	0.00 ms to 100.00 ms	0.20	ms	Real time	" H08_en.30" on page 211
H08.31	2008-20h	Disturbance cutoff frequency	10 Hz to 4000 Hz	600	Hz	Real time	" H08_en.31" on page 211
H08.32	2008-21h	Disturbance compensation gain	0% to 100%	0	%	Real time	" H08_en.32" on page 211
H08.33	2008-22h	Disturbance observer inertia correction coefficient	1% to 1600%	100	%	Real time	" H08_en.33" on page 212

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H08.37	2008-26h	Phase modulation for medium-frequency jitter suppression 2	-90° to +90°	0	°	Real time	" H08_en.37" on page 212
H08.38	2008-27h	Medium-frequency suppression 2 frequency	0 Hz to 1000 Hz	0	Hz	Real time	" H08_en.38" on page 212
H08.39	2008-28h	Compensation gain of medium-frequency jitter suppression 2	0% to 300%	0	%	Real time	" H08_en.39" on page 213
H08.40	2008-29h	Speed observer selection	0: Disable 1: Enable	0	-	Real time	" H08_en.40" on page 213
H08.42	2008-2Bh	Model control selection	0: Disable 1: Enable 2: Dual-inertia model	0	-	Real time	" H08_en.42" on page 213
H08.43	2008-2Ch	Model gain	0.1 to 2000.0	40.0	-	Real time	" H08_en.43" on page 213
H08.45	2008-2Eh	Model feedforward position	0 to 1	1	-	Real time	" H08_en.45" on page 214
H08.46	2008-2Fh	Feedforward value	0.0 to 102.4	95.0	-	Real time	" H08_en.46" on page 214
H08.50	2008-33h	Model torque feedforward derivative time	0.00 ms to 655.35 ms	0.00	ms	Real time	" H08_en.50" on page 214
H08.51	2008-34h	Model speed feedforward derivative time	0.00 ms to 20.00 ms	0.00	ms	Real time	" H08_en.51" on page 215
H08.53	2008-36h	Medium- and low-frequency jitter suppression frequency 3	0.0 Hz to 300.0 Hz	0.0	Hz	Real time	" H08_en.53" on page 215
H08.54	2008-37h	Medium- and low-frequency jitter suppression compensation 3	0% to 200%	0	%	Real time	" H08_en.54" on page 215

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H08.56	2008-39h	Medium- and low-frequency jitter suppression phase modulation 3	0% to 600%	100	%	Real time	"H08_en.56" on page 215
H08.59	2008-3Ch	Medium- and low-frequency jitter suppression frequency 4	0.0 Hz to 300.0 Hz	0.0	Hz	Real time	"H08_en.59" on page 216
H08.60	2008-3Dh	Medium- and low-frequency jitter suppression compensation 4	0% to 200%	0	%	Real time	"H08_en.60" on page 216
H08.61	2008-3Eh	Medium- and low-frequency jitter suppression phase modulation 4	0% to 600%	100	%	Real time	"H08_en.61" on page 216
H08.62	2008-3Fh	Position loop integral time constant	0.15 to 512.00	512.00	-	Real time	"H08_en.62" on page 216
H08.63	2008-40h	2nd position loop integral time constant	0.15 to 512.00	512.00	-	Real time	"H08_en.63" on page 217
H08.64	2008-41h	Speed observer feedback source	0: Disable 1: Enable	0	-	Real time	"H08_en.64" on page 217
H08.65	2008-42h	Zero deviation control selection	0: Disable 1: Enable	0	-	Real time	"H08_en.65" on page 217
H08.66	2008-43h	Zero deviation control position average filter	0.0 ms to 320.0 ms	5.0	ms	Real time	"H08_en.66" on page 218
H08.67	2008-44h	Low-pass filter for zero deviation control position	0.0 μs to 5120.0 μs	190.0	μs	Real time	"H08_en.67" on page 218

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H08.68	2008-45h	Speed feedforward of zero deviation control	0.0% to 100.0%	100.0	%	Real time	" H08_en.68" on page 218
H08.69	2008-46h	Torque feedforward of zero deviation control	0.0% to 100.0%	100.0	%	Real time	" H08_en.69" on page 218
H08.71	2008-48h	Zero deviation control encoder delay	0.00 μs to 512.00 μs	31.25	μs	Real time	" H08_en.71" on page 219
H08.81	2008-52h	Anti-resonance frequency of dual-inertia model	1.0 Hz to 400.0 Hz	20.0	Hz	Real time	" H08_en.81" on page 219
H08.82	2008-53h	Resonance frequency of dual-inertia model	0.0 Hz to 6553.5 Hz	0.0	Hz	Real time	" H08_en.82" on page 219
H08.83	2008-54h	Dual-inertia model gain	0.1 to 300.0	60.0	-	Real time	" H08_en.83" on page 220
H08.84	2008-55h	Inertia ratio of dual-inertia model	0.00 to 120.00	1.00	-	Real time	" H08_en.84" on page 220
H08.88	2008-59h	Speed feedforward value of dual-inertia model	0.0 to 6553.5	100.0	-	Real time	" H08_en.88" on page 220
H08.89	2008-5Ah	Torque feedforward value of dual-inertia model	0.0 to 6553.5	100.0	-	Real time	" H08_en.89" on page 220

6.10 List of H09 Auto-adjust Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H09.00	2009-01h	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_en.00" on page 221
H09.01	2009-02h	Stiffness level	0–41	15	-	Immediately	"H09_en.01" on page 221
H09.02	2009-03h	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_en.02" on page 222
H09.03	2009-04h	Online inertia auto-tuning mode	0: Disabled 1: Enabled, changing slowly 2: Enabled, changing normally 3: Enabled, changing quickly	2	-	Immediately	"H09_en.03" on page 222
H09.05	2009-06h	Offline inertia auto-tuning mode	0: Bi-directional 1: Unidirectional	1	-	At stop	"H09_en.05" on page 222
H09.06	2009-07h	Max. speed of inertia auto-tuning	100 rpm to 1000 rpm	500	rpm	At stop	"H09_en.06" on page 223

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H09.07	2009-08h	Time constant for accelerating to max. speed during inertia auto-tuning	20 ms to 800 ms	125	ms	At stop	" H09_en.07" on page 223
H09.08	2009-09h	Interval time after an individual inertia auto-tuning	50 ms to 10000 ms	800	ms	At stop	" H09_en.08" on page 223
H09.09	2009-0Ah	Number of motor revolutions per inertia auto-tuning	0.00–100.00	1.00	-	Immediately	" H09_en.09" on page 224
H09.11	2009-0Ch	Vibration threshold	0.0% to 100.0%	5.0	%	Immediately	" H09_en.11" on page 224
H09.12	2009-0Dh	Frequency of the 1st notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.12" on page 224
H09.13	2009-0Eh	Width level of the 1st notch	0–20	2	-	Immediately	" H09_en.13" on page 225
H09.14	2009-0Fh	Depth level of the 1st notch	0–99	0	-	Immediately	" H09_en.14" on page 225
H09.15	2009-10h	Frequency of the 2nd notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.15" on page 225
H09.16	2009-11h	Width level of the 2nd notch	0–20	2	-	Immediately	" H09_en.16" on page 226
H09.17	2009-12h	Depth level of the 2nd notch	0–99	0	-	Immediately	" H09_en.17" on page 226
H09.18	2009-13h	Frequency of the 3rd notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.18" on page 226
H09.19	2009-14h	Width level of the 3rd notch	0–20	2	-	Immediately	" H09_en.19" on page 226
H09.20	2009-15h	Depth level of the 3rd notch	0–99	0	-	Immediately	" H09_en.20" on page 227
H09.21	2009-16h	Frequency of the 4th notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.21" on page 227
H09.22	2009-17h	Width level of the 4th notch	0–20	2	-	Immediately	" H09_en.22" on page 227
H09.23	2009-18h	Depth level of the 4th notch	0–99	0	-	Immediately	" H09_en.23" on page 227

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H09.24	2009-19h	Auto-tuned resonance frequency	0 Hz to 5000 Hz	0	Hz	Unchangeable	" H09_en.24" on page 228
H09.26	2009-1Bh	ITune response	50.0% to 500.0%	100.0	%	Immediately	" H09_en.26" on page 228
H09.27	2009-1Ch	ITune mode	0: Disabled 1: ITune mode 1 2: ITune mode 2	0	-	Immediately	" H09_en.27" on page 228
H09.28	2009-1Dh	Minimum inertia ratio of ITune	0.0% to 80.0%	0.0	%	Immediately	" H09_en.28" on page 229
H09.29	2009-1Eh	Maximum inertia ratio of ITune	1.0% to 120.0%	30.0	%	Immediately	" H09_en.29" on page 229
H09.32	2009-21h	Gravity compensation value	0.0% to 100.0%	0.0	%	Immediately	" H09_en.32" on page 229
H09.33	2009-22h	Positive friction compensation value	0.0% to 100.0%	0.0	%	Immediately	" H09_en.33" on page 229
H09.34	2009-23h	Negative friction compensation value	-100.0% to 0.0%	0.0	%	Immediately	" H09_en.34" on page 230
H09.35	2009-24h	Friction compensation speed	0.0-20.0	2.0	-	Immediately	" H09_en.35" on page 230
H09.36	2009-25h	Friction compensation speed	0: Slow mode+Speed reference 1: Slow mode+Model speed 2: Slow mode+Speed feedback 3: Slow mode+Observe speed 16: Quick mode +Speed reference 17: Quick mode +Model speed 18: Quick mode +Speed feedback 19: Quick mode+Observe speed	0	-	Immediately	" H09_en.36" on page 230
H09.37	2009-26h	Vibration monitoring time	0-65535	600	-	Immediately	" H09_en.37" on page 231

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H09.38	2009-27h	Frequency of low-frequency resonance suppression 1 at the mechanical end	1.0 Hz to 100.0 Hz	100.0	Hz	Immediately	"H09_en.38" on page 231
H09.39	2009-28h	Low-frequency resonance suppression 1 at the mechanical end	0–3	2	-	At stop	"H09_en.39" on page 231
H09.41	2009-2Ah	Frequency of the 5th notch	50 Hz to 8000 Hz	8000	Hz	Immediately	"H09_en.41" on page 232
H09.42	2009-2Bh	Width level of the 5th notch	0–20	2	-	At stop	"H09_en.42" on page 232
H09.43	2009-2Ch	Depth level of the 5th notch	0–99	0	-	At stop	"H09_en.43" on page 232
H09.44	2009-2Dh	Frequency of low-frequency resonance suppression 2 at mechanical load end	0.0–100.0	0.0	-	Immediately	"H09_en.44" on page 232
H09.45	2009-2Eh	Responsiveness of low-frequency resonance suppression 2 at mechanical load end	0.01–5.00	1.00	-	Immediately	"H09_en.45" on page 233
H09.47	2009-30h	Width of low-frequency resonance suppression 2 at mechanical load end	0.00–2.00	1.00	-	Immediately	"H09_en.47" on page 233
H09.49	2009-32h	Frequency of low-frequency resonance suppression 3 at mechanical load end	0.0–100.0	0.0	-	Immediately	"H09_en.49" on page 233

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H09.50	2009-33h	Responsiveness of low-frequency resonance suppression 3 at mechanical load end	0.01–5.00	1.00	-	Immediately	*"H09_en.50" on page 234*
H09.52	2009-35h	Width of low-frequency resonance suppression 3 at mechanical load end	0.00–2.00	1.00	-	Immediately	*"H09_en.52" on page 234*
H09.54	2009-37h	Vibration threshold	0.0% to 300.0%	50.0	%	Immediately	*"H09_en.54" on page 234*
H09.56	2009-39h	Max. overshoot allowed by ETune	0–65535	2936	-	Immediately	*"H09_en.56" on page 234*
H09.57	2009-3Ah	STune resonance suppression switchover frequency	0 Hz to 4000 Hz	900	Hz	Immediately	*"H09_en.57" on page 235*
H09.58	2009-3Bh	STune resonance suppression reset selection	0: Disabled 1: Enabled	0	-	Immediately	*"H09_en.58" on page 235*

6.11 List of H0A Fault and Protection Parameters

Parameter code	Communication address	Parameter name	Value range	Default value	Unit	Change mode	Page
H0A.00	200A-01h	Power input phase loss protection	0: Enable 1: Disable	0	-	Real time	*"H0A_en.00" on page 235*
H0A.01	200A-02h	Absolute position limit	0: Disabled 1: Enabled 2: Enabled after homing	0	-	Real time	*"H0A_en.01" on page 236*
H0A.04	200A-05h	Motor overload protection gain	50 to 300	100	-	Real time	*"H0A_en.04" on page 236*
H0A.08	200A-09h	Overspeed threshold	0 RPM to 20000 RPM	0	RPM	Real time	*"H0A_en.08" on page 236*

Parameter code	Communication address	Parameter name	Value range	Default value	Unit	Change mode	Page
H0A.10	200A-0Bh	Threshold of excessive local position deviation	0 to 4294967295	2198955608	-	Real time	"H0A_en.10" on page 237
H0A.12	200A-0Dh	Runaway protection	0: Disable 1: Enable	1	-	Real time	"H0A_en.12" on page 237
H0A.18	200A-13h	IGBT over-temperature threshold	120°C to 175°C	140	°C	Real time	"H0A_en.18" on page 237
H0A.19	200A-14h	Filter time constant of touch probe 1	0.00 µs to 6.30 µs	2.00	µs	Real time	"H0A_en.19" on page 238
H0A.20	200A-15h	Filter time constant of touch probe 2	0.00 µs to 6.30 µs	2.00	µs	Real time	"H0A_en.20" on page 238
H0A.22	200A-17h	Sigma Delta filter time	0 to 65535	1	-	At stop	"H0A_en.22" on page 238
H0A.23	200A-18h	TZ signal filter time	0 ns to 31 ns	15	25 ns	At stop	"H0A_en.23" on page 239
H0A.25	200A-1Ah	Speed display DO low-pass filter time	0 ms to 5000 ms	0	ms	Real time	"H0A_en.25" on page 239
H0A.26	200A-1Bh	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	-	Real time	"H0A_en.26" on page 239
H0A.27	200A-1Ch	Average filter time for speed display DO	0 ms to 100 ms	50	ms	Real time	"H0A_en.27" on page 239
H0A.32	200A-21h	Time threshold for locked motor overheat protection	10 ms to 65535 ms	200	ms	Real time	"H0A_en.32" on page 240
H0A.33	200A-22h	Stall overtemperature protection	0: Disabled 1: Enabled	1	-	Real time	"H0A_en.33" on page 240
H0A.36	200A-25h	Encoder multi-turn overflow fault selection	0: Not hide 1: Hide	0	-	Real time	"H0A_en.36" on page 240

Parameter code	Communication address	Parameter name	Value range	Default value	Unit	Change mode	Page
H0A.40	200A-29h	Compensation function selection	bit0: Overtravel compensation 0: Enabled 1: Disabled bit1: Touch probe rising edge compensation 0: Disabled 1: Enabled bit2: Touch probe falling edge compensation 0: Disabled 1: Enabled bit3: Touch probe solution 0: New solution 1: Old solution (same as SV660N)	6	-	At stop	*"H0A_en.40" on page 241*
H0A.41	200A-2Ah	Forward position of software position limit	-2147483648 to 2147483647	2147483647	Encoder unit	At stop	*"H0A_en.41" on page 241*
H0A.43	200A-2Ch	Reverse position of software position limit	-2147483648 to 2147483647	-2147483648	Encoder unit	At stop	*"H0A_en.43" on page 241*
H0A.49	200A-32h	Braking resistor overtemperature threshold	100°C to 175°C	115	°C	Real time	*"H0A_en.49" on page 242*
H0A.50	200A-33h	Encoder communication fault tolerance threshold	0 to 31	5	-	Real time	*"H0A_en.50" on page 242*
H0A.51	200A-34h	Phase loss detection filter times	3 ms to 36 ms	20	55 ms	Real time	*"H0A_en.51" on page 242*
H0A.52	200A-35h	Encoder temperature protection threshold	0°C to 175°C	105	°C	Real time	*"H0A_en.52" on page 243*
H0A.53	200A-36h	Probe DI ON compensation time	-3000 ns to 3000 ns	200	25 ns	Real time	*"H0A_en.53" on page 243*
H0A.54	200A-37h	Probe DI OFF compensation time	-3000 ns to 3000 ns	1512	25 ns	Real time	*"H0A_en.54" on page 243*
H0A.55	200A-38h	Runaway current threshold	100.0% to 400.0%	200.0	%	Real time	*"H0A_en.55" on page 243*
H0A.56	200A-39h	Fault reset delay	0 ms to 60000 ms	10000	ms	Real time	*"H0A_en.56" on page 244*

Parameter code	Communication address	Parameter name	Value range	Default value	Unit	Change mode	Page
H0A.57	200A-3Ah	Runaway speed threshold	1 RPM to 1000 RPM	50	RPM	Real time	"H0A_en.57" on page 244
H0A.58	200A-3Bh	Runaway speed filter time	0.1 ms to 100.0 ms	2.0	ms	Real time	"H0A_en.58" on page 244
H0A.59	200A-3Ch	Runaway protection detection time	10 ms to 1000 ms	30	ms	Real time	"H0A_en.59" on page 244
H0A.60	200A-3Dh	Black box function mode	0: Disable 1: Any fault 2: Designated fault 3: Triggered based on designated condition	1	-	Real time	"H0A_en.60" on page 245
H0A.61	200A-3Eh	Designated fault code	0.0 to 6553.5	0.0	-	Real time	"H0A_en.61" on page 245
H0A.62	200A-3Fh	Trigger source	0 to 25	0	-	Real time	"H0A_en.62" on page 245
H0A.63	200A-40h	Trigger level	-2147483648 to 2147483647	0	-	Real time	"H0A_en.63" on page 246
H0A.65	200A-42h	Trigger level	0: Rising edge 1: Equal 2: Falling edge 3: Edge-triggered	0	-	Real time	"H0A_en.65" on page 246
H0A.66	200A-43h	Trigger position	0% to 100%	75	%	Real time	"H0A_en.66" on page 246
H0A.67	200A-44h	Sampling frequency	0: Current loop 1: Position loop 2: Main cycle	0	-	Real time	"H0A_en.67" on page 247
H0A.70	200A-47h	Overspeed threshold 2	0 RPM to 20000 RPM	0	RPM	Real time	"H0A_en.70" on page 247
H0A.71	200A-48h	MS1 motor overload curve switchover	0 to 65535	4098	-	Real time	"H0A_en.71" on page 247
H0A.72	200A-49h	Maximum stop time in ramp-to-stop	0 ms to 65535 ms	10000	ms	At stop	"H0A_en.72" on page 248
H0A.73	200A-4Ah	STO 24 V disconnection filter time	1 ms to 5ms	5	ms	Real time	"H0A_en.73" on page 248
H0A.74	200A-4Bh	Filter time for two inconsistent STO channels	1 ms to 1000 ms	100	ms	Real time	"H0A_en.74" on page 248
H0A.75	200A-4Ch	Servo OFF delay after STO triggered	0 ms to 25 ms	20	ms	Real time	"H0A_en.75" on page 249

Parameter code	Communication address	Parameter name	Value range	Default value	Unit	Change mode	Page
H0A.81	200A-52h	Enable voltage drop protection	0: No operation 1: Host controller executes torque limit 2: Servo executes torque limit	0	-	At stop	*"H0A_en.81" on page 249*
H0A.82	200A-53h	Voltage drop torque limit	0.0% to 100.0%	50.0	%	Real time	*"H0A_en.82" on page 249*
H0A.83	200A-54h	Torque limit cancellation time	0 ms to 1000 ms	100	ms	Real time	*"H0A_en.83" on page 249*
H0A.84	200A-55h	Instantaneous power failure hold time	20 ms to 50000 ms	1000	ms	Real time	*"H0A_en.84" on page 250*
H0A.85	200A-56h	Open circuit detection torque reference	4.0% to 400.0%	5.0	%	At stop	*"H0A_en.85" on page 250*
H0A.86	200A-57h	Open circuit detection filter time	5 ms to 1000 ms	30	ms	At stop	*"H0A_en.86" on page 250*
H0A.90	200A-5Bh	Moving average filter time for displayed speed values	0 ms to 100 ms	0	ms	Real time	*"H0A_en.90" on page 250*
H0A.91	200A-5Ch	Moving average filter time for displayed torque values	0 ms to 100 ms	0	ms	Real time	*"H0A_en.91" on page 251*
H0A.92	200A-5Dh	Moving average filter time for displayed position values	0 ms to 100 ms	0	ms	Real time	*"H0A_en.92" on page 251*
H0A.93	200A-5Eh	Low-pass filter time for displayed voltage values	0 ms to 250ms	0	ms	Real time	*"H0A_en.93" on page 251*
H0A.94	200A-5Fh	Low-pass filter time for displayed thermal values	0 ms to 250ms	0	ms	Real time	*"H0A_en.94" on page 251*

6.12 List of H0b Monitoring Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0b.00	200b-01h	Motor speed actual value	-32767 rpm to +32767 rpm	0	rpm	Unchangeable	" H0b_en.00" on page 252
H0b.01	200b-02h	Speed reference	-32767 rpm to +32767 rpm	0	rpm	Unchangeable	" H0b_en.01" on page 252
H0b.02	200b-03h	Internal torque reference	-500.0% to 500.0%	0.0	%	Unchangeable	" H0b_en.02" on page 252
H0b.03	200b-04h	Monitored DI status	0-65535	0	-	Unchangeable	" H0b_en.03" on page 253
H0b.05	200b-06h	Monitored DO status	0-65535	0	-	Unchangeable	" H0b_en.05" on page 253
H0b.07	200b-08h	Absolute position counter	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.07" on page 253
H0b.09	200b-0Ah	Mechanical angle	0.0° to 360.0°	0.0	°	Unchangeable	" H0b_en.09" on page 254
H0b.10	200b-0Bh	Electrical angle	0.0° to 360.0°	0.0	°	Unchangeable	" H0b_en.10" on page 254
H0b.12	200b-0Dh	Average load rate	0.0% to 800.0%	0.0	%	Unchangeable	" H0b_en.12" on page 254
H0b.15	200b-10h	Position following error (encoder unit)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.15" on page 255
H0b.17	200b-12h	Feedback pulse counter	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.17" on page 255
H0b.19	200b-14h	Total power-on time	0.0s-429496729.5s	0.0	s	Unchangeable	" H0b_en.19" on page 255
H0b.21	200b-16h	Displayed AI1 voltage	-12.00 V to 12.00 V	0.00	V	Unchangeable	" H0b_en.21" on page 256
H0b.24	200b-19h	RMS value of phase current	0.0 A to 6553.5 A	0.0	A	Unchangeable	" H0b_en.24" on page 256

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0b.26	200b-1Bh	Bus voltage	0.0 V to 6553.5 V	0.0	V	Unchangeable	" H0b_en.26" on page 256
H0b.27	200b-1Ch	Module temperature	-20℃ to 200℃	0	℃	Unchangeable	" H0b_en.27" on page 257
H0b.28	200b-1Dh	Absolute encoder fault information given by FPGA	0-65535	0	-	Unchangeable	" H0b_en.28" on page 257
H0b.29	200b-1Eh	Axis status information given by FPGA	0-65535	0	-	Unchangeable	" H0b_en.29" on page 257
H0b.30	200b-1Fh	Axis fault information given by FPGA	0-65535	0	-	Unchangeable	" H0b_en.30" on page 257
H0b.31	200b-20h	Encoder fault information	0-65535	0	-	Unchangeable	" H0b_en.31" on page 258
H0b.33	200b-22h	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_en.33" on page 258
H0b.34	200b-23h	Fault code of the selected fault	0-65535	0	-	Unchangeable	" H0b_en.34" on page 259

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0b.35	200b-24h	Time stamp upon occurrence of the selected fault	0.0s-429496729.5s	0.0	s	Unchangeable	"H0b_en.35" on page 259
H0b.37	200b-26h	Motor speed upon occurrence of the selected fault	-32767 rpm to +32767 rpm	0	rpm	Unchangeable	"H0b_en.37" on page 259
H0b.38	200b-27h	Motor phase U current upon occurrence of the selected fault	-3276.7 A to 3276.7 A	0.0	A	Unchangeable	"H0b_en.38" on page 259
H0b.39	200b-28h	Motor phase V current upon occurrence of the selected fault	-3276.7 A to 3276.7 A	0.0	A	Unchangeable	"H0b_en.39" on page 260
H0b.40	200b-29h	Bus voltage upon occurrence of the selected fault	0.0 V to 6553.5 V	0.0	V	Unchangeable	"H0b_en.40" on page 260
H0b.41	200b-2Ah	DI status upon occurrence of the selected fault	0-65535	0	-	Unchangeable	"H0b_en.41" on page 260
H0b.43	200b-2Ch	DO status upon occurrence of the selected fault	0-65535	0	-	Unchangeable	"H0b_en.43" on page 260
H0b.45	200b-2Eh	Internal fault code	0-65535	0	-	Unchangeable	"H0b_en.45" on page 261
H0b.46	200b-2Fh	Absolute encoder fault information given by FPGA upon occurrence of the selected fault	0-65535	0	-	Unchangeable	"H0b_en.46" on page 261

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0b.47	200b-30h	System status information given by FPGA upon occurrence of the selected fault	0-65535	0	-	Unchangeable	" H0b_en.47" on page 261
H0b.48	200b-31h	System fault information given by FPGA upon occurrence of the selected fault	0-65535	0	-	Unchangeable	" H0b_en.48" on page 261
H0b.49	200b-32h	Encoder fault information upon occurrence of the selected fault	0-65535	0	-	Unchangeable	" H0b_en.49" on page 262
H0b.51	200b-34h	Internal fault code upon occurrence of the selected fault	0-65535	0	-	Unchangeable	" H0b_en.51" on page 262
H0b.52	200b-35h	FPGA timeout fault standard bit upon occurrence of the selected fault	0-65535	0	-	Unchangeable	" H0b_en.52" on page 262
H0b.53	200b-36h	Position following error (reference unit)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.53" on page 262
H0b.55	200b-38h	Motor speed actual value	-2147483648.0rpm to 2147483647.0rpm	0.0	rpm	Unchangeable	" H0b_en.55" on page 263
H0b.57	200b-3Ah	Bus voltage of the control circuit	0.0 V to 6553.5 V	0.0	V	Unchangeable	" H0b_en.57" on page 263
H0b.58	200b-3Bh	Mechanical absolute position (low 32 bits)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.58" on page 263

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0b.60	200b-3Dh	Mechanical absolute position (high 32 bits)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.60" on page 264
H0b.63	200b-40h	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_en.63" on page 264
H0b.66	200b-43h	Encoder temperature	-32768℃ to 32767℃	0	℃	Unchangeable	" H0b_en.66" on page 264
H0b.67	200b-44h	Load rate of regenerative resistor	0.0% to 200.0%	0.0	%	Unchangeable	" H0b_en.67" on page 265
H0b.70	200b-47h	Number of absolute encoder revolutions	0 Rev to 65535 Rev	0	Rev	Unchangeable	" H0b_en.70" on page 265
H0b.71	200b-48h	Single-turn position fed back by the absolute encoder	0 p to 2147483647 p	0	p	Unchangeable	" H0b_en.71" on page 265
H0b.74	200b-4Bh	System fault information given by FPGA	0-65535	0	-	Unchangeable	" H0b_en.74" on page 265
H0b.77	200b-4Eh	Encoder position (low 32 bits)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.77" on page 266
H0b.79	200b-50h	Encoder position (high 32 bits)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.79" on page 266
H0b.81	200b-52h	Single-turn position of the rotary load (low 32 bits)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.81" on page 266

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0b.83	200b-54h	Single-turn position of the rotary load (high 32 bits)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.83" on page 266
H0b.85	200b-56h	Single-turn position of the rotary load (reference unit)	-2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.85" on page 267
H0b.87	200b-58h	IGBT junction temperature	0-200	0	-	Unchangeable	" H0b_en.87" on page 267
H0b.90	200b-5Bh	Group No. of the abnormal parameter	0-65535	0	-	Unchangeable	" H0b_en.90" on page 267
H0b.91	200b-5Ch	Offset within the group of the abnormal parameter	0-65535	0	-	Unchangeable	" H0b_en.91" on page 268
H0b.94	200b-5Fh	Individual power-on time	0.0s-429496729.5s	0.0	s	Unchangeable	" H0b_en.94" on page 268
H0b.96	200b-61h	Individual power-on time upon occurrence of the selected fault	0.0s-429496729.5s	0.0	s	Unchangeable	" H0b_en.96" on page 268

6.13 Parameter Group H0C

Parameter code	Parameter address	Parameter name	Value range	Default value	Unit	Change mode	Page
H0C.71	200C-48h	Internal function switchover switch	0 to 65535	0	-	Real time	" H0C_en.71" on page 268

6.14 List of H0d Auxiliary Function Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H0d.00	200d-01h	Software Reset	0: No operation 1: Enable	0	-	At stop	"H0d_en.00" on page 269
H0d.01	200d-02h	Fault Reset	0: No operation 1: Enable	0	-	At stop	"H0d_en.01" on page 269
H0d.02	200d-03h	Inertia auto-tuning selection	0-65	0	-	Immediately	"H0d_en.02" on page 270
H0d.03	200d-04h	Encoder initial angle auto-tuning	0: No operation 1: Enabled	0	-	At stop	"H0d_en.03" on page 270
H0d.04	200d-05h	Read/write in encoder ROM	0: No operation 1: Write ROM 2: Read ROM 3: ROM failure	0	-	At stop	"H0d_en.04" on page 270
H0d.05	200d-06h	Emergency stop	0: No operation 1: Emergency stop	0	-	Immediately	"H0d_en.05" on page 271
H0d.10	200d-0Bh	Auto-tuning of analog channel	0: No operation 1: AI1 adjustment	0	-	At stop	"H0d_en.10" on page 271
H0d.12	200d-0Dh	Phase U/V current balance correction	0: Disabled 1: Enabled	0	-	At stop	"H0d_en.12" on page 271
H0d.17	200d-12h	Forced DI/DO enable switch	bit0: Forced DI enable switch 0: Disabled 1: Enabled bit1: Forced DO enable switch 0: Disabled 1: Enabled	0	-	Immediately	"H0d_en.17" on page 272
H0d.18	200d-13h	Forced DI value	0-255	255	-	Immediately	"H0d_en.18" on page 272
H0d.19	200d-14h	Forced DO value	0-15	0	-	Immediately	"H0d_en.19" on page 272
H0d.20	200d-15h	Absolute encoder reset selection	0: No operation 1 Reset 2: Reset the fault and multi-turn data	0	-	At stop	"H0d_en.20" on page 273
H0d.23	200d-18h	Torque fluctuation auto-tuning	0-1	0	-	At stop	"H0d_en.23" on page 273

6.15 List of H0E Communication Function Parameters

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H0E.00	200E-01h	Node address	1 to 127	1	-	At stop	*"H0E_en.00" on page 273*
H0E.01	200E-02h	Save objects written through communication to EEPROM	0: Not save 1: Save parameters written through communication to EEPROM 2: Save object dictionaries written through communication to EEPROM 3: Save parameters and object dictionaries written through communication to EEPROM 4: Save object dictionaries written before communication (OP) to EEPROM	4	-	Real time	*"H0E_en.01" on page 274*
H0E.15	200E-10h	Group 6000 index selection (taking the last two bits)	0 to 255	255	-	Real time	*"H0E_en.15" on page 274*
H0E.16	200E-11h	Group 6000 sub-index selection	0 to 2	0	-	Real time	*"H0E_en.16" on page 274*
H0E.20	200E-15h	EtherCAT slave name	0 to 65535	0	-	Unchangeable	*"H0E_en.20" on page 275*
H0E.21	200E-16h	EtherCAT slave alias	0 to 65535	0	-	At stop	*"H0E_en.21" on page 275*
H0E.22	200E-17h	Number of synchronous loss events allowed by EtherCAT	1 to 20	8	-	Real time	*"H0E_en.22" on page 275*
H0E.24	200E-19h	Sync loss count	0 to 65535	0	-	Unchangeable	*"H0E_en.24" on page 275*
H0E.25	200E-1Ah	Maximum number of error frames and invalid frames of EtherCAT port 0 per unit time	0 to 65535	0	-	Unchangeable	*"H0E_en.25" on page 276*

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H0E.26	200E-1Bh	Maximum number of error frames and invalid frames of EtherCAT port 1 per unit time	0 to 65535	0	-	Unchangeable	"H0E_en.26" on page 276
H0E.27	200E-1Ch	Maximum number of error frames forwarded by the EtherCAT port per unit time	0 to 65535	0	-	Unchangeable	"H0E_en.27" on page 276
H0E.28	200E-1Dh	Maximum number of data frame processing unit errors on the EtherCAT port per unit time	0 to 255	0	-	Unchangeable	"H0E_en.28" on page 276
H0E.29	200E-1Eh	Maximum number of lost links on the EtherCAT port per unit time	0 to 65535	0	-	Unchangeable	"H0E_en.29" on page 277
H0E.31	200E-20h	EtherCAT synchronization mode setting	0 to 2	2	-	At stop	"H0E_en.31" on page 277
H0E.32	200E-21h	EtherCAT synchronization error threshold	100 ns to 4000ns	3000	ns	At stop	"H0E_en.32" on page 277
H0E.33	200E-22h	EtherCAT state machine status and port connection status	0 to 65535	0	-	Unchangeable	"H0E_en.33" on page 277
H0E.34	200E-23h	Threshold of excessive CSP position reference increment events	1 to 30	20	-	Real time	"H0E_en.34" on page 278

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H0E.35	200E-24h	AL fault code	0 to 65535	0	-	Unchangeable	" H0E_en.35" on page 278
H0E.36	200E-25h	EtherCAT enhanced link enable	0: Disable 1: Enable	0	-	Real time	" H0E_en.36" on page 278
H0E.37	200E-26h	EtherCAT XML reset selection	0: Disable 1: Enable	0	-	Real time	" H0E_en.37" on page 279
H0E.80	200E-51h	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	-	Real time	" H0E_en.80" on page 279
H0E.81	200E-52h	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	-	Real time	" H0E_en.81" on page 280
H0E.82	200E-53h	Modbus response delay	0 ms to 20 ms	0	ms	Real time	" H0E_en.82" on page 280
H0E.83	200E-54h	Modbus communication timeout	0 ms to 600 ms	0	ms	Real time	" H0E_en.83" on page 280
H0E.84	200E-55h	Sequence of Modbus communication data bits	0: High bits before low bits 1: Low bits before high bits	1	-	Real time	" H0E_en.84" on page 281
H0E.90	200E-5Bh	ESC version	0.00 to 655.35	0.00	-	Unchangeable	" H0E_en.90" on page 281
H0E.93	200E-5Eh	PHY type	0.00 to 655.35	0.00	-	Unchangeable	" H0E_en.93" on page 281
H0E.96	200E-61h	XML version information	0.00 to 655.35	0.00	-	Unchangeable	" H0E_en.96" on page 281

6.16 List of H18 Position Comparison Output Parameters

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H18.00	2018-01h	Position comparison output selection	0: Disable 1: Enable (rising edge triggered)	0	-	Real time	"H18_en.00" on page 282
H18.01	2018-02h	Position comparison output feedback source	0: Motor encoder feedback	0	-	Real time	"H18_en.01" on page 282
H18.02	2018-03h	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	1	-	Real time	"H18_en.02" on page 282
H18.03	2018-04h	Position comparison mode	0: Individual comparison mode 1: Cyclic comparison mode 2: Fixed cyclic comparison mode	0	-	Real time	"H18_en.03" on page 283
H18.04	2018-05h	Current position as zero	0: Disable 1: Enable (rising edge triggered)	0	-	Real time	"H18_en.04" on page 283
H18.05	2018-06h	Position comparison output width	0.1 ms to 204.7 ms	0.1	ms	Real time	"H18_en.05" on page 283
H18.07	2018-08h	Position comparison start point	0 to 40	0	-	Real time	"H18_en.07" on page 284
H18.08	2018-09h	Position comparison end point	0 to 40	0	-	Real time	"H18_en.08" on page 284
H18.09	2018-0Ah	Current state of position comparison	0 to 1024	0	-	Unchangeable	"H18_en.09" on page 284
H18.10	2018-0Bh	Real-time position of position comparison	-2147483648 to 2147483647	0	-	Unchangeable	"H18_en.10" on page 284
H18.12	2018-0Dh	Zero offset of position comparison	-2147483648 to 2147483647	0	-	Real time	"H18_en.12" on page 285

Parameter code	Hex	Parameter name	Value range	Default value	Unit	Change mode	Page
H18.14	2018-0Fh	Position comparison output delay compensation	-12.00 μs to 12.00 μs	0.00	μs	Real time	"H18_en.14" on page 285
H18.15	2018-10h	Number of cycles in fixed mode	1 to 65535	1	-	Real time	"H18_en.15" on page 285
H18.17	2018-12h	Number of completions in fixed mode	0 to 65535	0	-	Unchangeable	"H18_en.17" on page 286

6.17 List of H19 Target Position Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.00	2019-01h	Target value of position comparison 1	-2147483648 to 2147483647	0	-	Immediately	"H19_en.00" on page 286
H19.02	2019-03h	Attribute value of position comparison 1	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	"H19_en.02" on page 286
H19.03	2019-04h	Target value of position comparison 2	-2147483648 to 2147483647	0	-	Immediately	"H19_en.03" on page 287

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.05	2019-06h	Attribute value of position comparison 2	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.05" on page 288*
H19.06	2019-07h	Target value of position comparison 3	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.06" on page 288*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.08	2019-09h	Attribute value of position comparison 3	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.08" on page 289*
H19.09	2019-0Ah	Target value of position comparison 4	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.09" on page 289*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.11	2019-0Ch	Attribute value of position comparison 4	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.11" on page 289*
H19.12	2019-0Dh	Target value of position comparison 5	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.12" on page 290*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.14	2019-0Fh	Attribute value of position comparison 5	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.14" on page 290*
H19.15	2019-10h	Target value of position comparison 6	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.15" on page 291*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.17	2019-12h	Attribute value of position comparison 6	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.17" on page 291*
H19.18	2019-13h	Target value of position comparison 7	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.18" on page 292*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.20	2019-15h	Attribute value of position comparison 7	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.20" on page 292*
H19.21	2019-16h	Target value of position comparison 8	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.21" on page 293*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.23	2019-18h	Attribute value of position comparison 8	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.23" on page 293*
H19.24	2019-19h	Target value of position comparison 9	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.24" on page 294*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.26	2019-1Bh	Attribute value of position comparison 9	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.26" on page 294*
H19.27	2019-1Ch	Target value of position comparison 10	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.27" on page 295*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.29	2019-1Eh	Attribute value of position comparison 10	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.29" on page 295*
H19.30	2019-1Fh	Target value of position comparison 11	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.30" on page 296*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.32	2019-21h	Attribute value of position comparison 11	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.32" on page 296*
H19.33	2019-22h	Target value of position comparison 12	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.33" on page 297*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.35	2019-24h	Attribute value of position comparison 12	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.35" on page 297*
H19.36	2019-25h	Target value of position comparison 13	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.36" on page 298*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.38	2019-27h	Attribute value of position comparison 13	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.38" on page 298*
H19.39	2019-28h	Target value of position comparison 14	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.39" on page 299*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.41	2019-2Ah	Attribute value of position comparison 14	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.41" on page 299*
H19.42	2019-2Bh	Target value of position comparison 15	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.42" on page 300*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.44	2019-2Dh	Attribute value of position comparison 15	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.44" on page 300*
H19.45	2019-2Eh	Target value of position comparison 16	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.45" on page 301*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.47	2019-30h	Attribute value of position comparison 16	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.47" on page 301*
H19.48	2019-31h	Target value of position comparison 17	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.48" on page 302*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.50	2019-33h	Attribute value of position comparison 17	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.50" on page 302*
H19.51	2019-34h	Target value of position comparison 18	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.51" on page 303*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.53	2019-36h	Attribute value of position comparison 18	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.53" on page 303*
H19.54	2019-37h	Target value of position comparison 19	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.54" on page 304*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.56	2019-39h	Attribute value of position comparison 19	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.56" on page 304*
H19.57	2019-3Ah	Target value of position comparison 20	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.57" on page 305*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.59	2019-3Ch	Attribute value of position comparison 20	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.59" on page 305*
H19.60	2019-3Dh	Target value of position comparison 21	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.60" on page 306*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.62	2019-3Fh	Attribute value of position comparison 21	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.62" on page 306*
H19.63	2019-40h	Target value of position comparison 22	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.63" on page 307*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.65	2019-42h	Attribute value of position comparison 22	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.65" on page 307*
H19.66	2019-43h	Target value of position comparison 23	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.66" on page 308*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.68	2019-45h	Attribute value of position comparison 23	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.68" on page 308*
H19.69	2019-46h	Target value of position comparison 24	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.69" on page 309*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.71	2019-48h	Attribute value of position comparison 24	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.71" on page 309*
H19.72	2019-49h	Target value of position comparison 25	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.72" on page 310*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.74	2019-4Bh	Attribute value of position comparison 25	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.74" on page 310*
H19.75	2019-4Ch	Target value of position comparison 26	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.75" on page 311*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.77	2019-4Eh	Attribute value of position comparison 26	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.77" on page 311*
H19.78	2019-4Fh	Target value of position comparison 27	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.78" on page 312*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.80	2019-51h	Attribute value of position comparison 27	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.80" on page 312*
H19.81	2019-52h	Target value of position comparison 28	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.81" on page 313*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.83	2019-54h	Attribute value of position comparison 28	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.83" on page 313*
H19.84	2019-55h	Target value of position comparison 29	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.84" on page 314*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.86	2019-57h	Attribute value of position comparison 29	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.86" on page 314*
H19.87	2019-58h	Target value of position comparison 30	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.87" on page 315*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.89	2019-5Ah	Attribute value of position comparison 30	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.89" on page 315*
H19.90	2019-5Bh	Target value of position comparison 31	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.90" on page 316*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.92	2019-5Dh	Attribute value of position comparison 31	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.92" on page 316*
H19.93	2019-5Eh	Target value of position comparison 32	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.93" on page 317*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.95	2019-60h	Attribute value of position comparison 32	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.95" on page 317*
H19.96	2019-61h	Target value of position comparison 33	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.96" on page 318*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.98	2019-63h	Attribute value of position comparison 33	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.98" on page 318*
H19.99	2019-64h	Target value of position comparison 34	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.99" on page 319*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.101	2019-66h	Attribute value of position comparison 34	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.101" on page 319*
H19.102	2019-67h	Target value of position comparison 35	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.102" on page 320*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.104	2019-69h	Attribute value of position comparison 35	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.104" on page 320*
H19.105	2019-6Ah	Target value of position comparison 36	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.105" on page 321*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.107	2019-6Ch	Attribute value of position comparison 36	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.107" on page 321*
H19.108	2019-6Dh	Target value of position comparison 37	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.108" on page 322*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.110	2019-6Fh	Attribute value of position comparison 37	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.110" on page 322*
H19.111	2019-70h	Target value of position comparison 38	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.111" on page 323*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.113	2019-72h	Attribute value of position comparison 38	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.113" on page 323*
H19.114	2019-73h	Target value of position comparison 39	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.114" on page 324*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.116	2019-75h	Attribute value of position comparison 39	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*" H19_en.116" on page 324*
H19.117	2019-76h	Target value of position comparison 40	-2147483648 to 2147483647	0	-	Immediately	*" H19_en.117" on page 325*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H19.119	2019-78h	Attribute value of position comparison 40	bit0: Current position changes from "less than" to "more than" the comparison point bit1: Current position changes from "more than" to "less than" the comparison point bit2: N/A bit3: N/A bit4: N/A bit5: N/A bit6: N/A bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: N/A bit12: N/A bit13: N/A bit14: N/A bit15: N/A	0	-	Immediately	*"H19_en.119" on page 325*

6.18 List of H1F Software Tool Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H1F.90	201F-5Bh	DI function state 1 read through communication	0-65535	0	-	Unchangeable	*"H1F_en.90" on page 326*
H1F.91	201F-5Ch	DI function state 2 read through communication	0-65535	0	-	Unchangeable	*"H1F_en.91" on page 326*
H1F.92	201F-5Dh	DI function state 3 read through communication	0-65535	0	-	Unchangeable	*"H1F_en.92" on page 327*

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H1F.93	201F-5Eh	DI function state 4 read through communication	0-65535	0	-	Unchangeable	*"H1F_en.93" on page 327*
H1F.94	201F-5Fh	DO function state 1 read through communication	0-65535	0	-	Unchangeable	*"H1F_en.94" on page 328*
H1F.95	201F-60h	DO function state 2 read through communication	0-65535	0	-	Unchangeable	*"H1F_en.95" on page 328*

6.19 List of H30 Communication Read Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H30.00	2030-01h	Servo status read through communication	0-65535	0	-	Unchangeable	*"H30_en.00" on page 328*
H30.01	2030-02h	DO function state 1 read through communication	0-65535	0	-	Unchangeable	*"H30_en.01" on page 329*
H30.02	2030-03h	DO function state 2 read through communication	0-65535	0	-	Unchangeable	*"H30_en.02" on page 329*

6.20 List of H31 Communication Set Parameters

Parameter	Hexadecimal Parameters	Parameter Name	Setpoint	Default	Unit	Change Method	Page
H31.04	2031-05h	DO state set through communication	0-65535	0	-	Immediately	*" H31_en.04" on page 329*
H31.05	2031-06h	AO set through communication	-10000 mV to 10000 mV	0	mV	Immediately	*" H31_en.05" on page 330*
H31.09	2031-0Ah	Speed reference set through communication	-9999.000rpm to 9999.000rpm	0.000	rpm	Immediately	*" H31_en.09" on page 330*
H31.11	2031-0Ch	Torque reference set through communication	-100.000% to 100.000%	0.000	%	Immediately	*" H31_en.11" on page 330*

6.21 List of 1000h Object Dictionary

Parameter	Name	Setpoint	Default	Unit	Change Method	Page
1000.00h	Device type	0-65535	0	-	Unchangeable	*" 1000_en.00h" on page 330*
1001.00h	Error Register	0-255	0	-	Unchangeable	*" 1001_en.00h" on page 331*
1018.01h	Vendor ID	0-65535	0	-	Unchangeable	*" 1018_en.01h" on page 331*
1018.02h	Product Code	0-65535	0	-	Unchangeable	*" 1018_en.02h" on page 331*
1018.03h	Revision	0-65535	0	-	Unchangeable	*" 1018_en.03h" on page 332*
1600.00h	Number of valid mapped objects in RPDO1	0-20	3	-	Immediately	*" 1600_en.00h" on page 332*
1600.01h	Mapped object 1 in RPDO1	0-2147483647	1614807040	-	Immediately	*" 1600_en.01h" on page 332*
1600.02h	Mapped object 2 in RPDO1	0-2147483647	1618608128	-	Immediately	*" 1600_en.02h" on page 333*

Parameter	Name	Setpoint	Default	Unit	Change Method	Page
1600.03h	Mapped object 3 in RPDO1	0–2147483647	1622671360	-	Immediately	*" 1600_en.03h" on page 333*
1600.04h	Mapped object 4 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.04h" on page 333*
1600.05h	Mapped object 5 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.05h" on page 333*
1600.06h	Mapped object 6 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.06h" on page 334*
1600.07h	Mapped object 7 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.07h" on page 334*
1600.08h	Mapped object 8 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.08h" on page 334*
1600.09h	Mapped object 9 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.09h" on page 334*
1600.0Ah	Mapped object 10 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.0Ah" on page 335*
1600.0Bh	Mapped object 11 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.0Bh" on page 335*
1600.0Ch	Mapped object 12 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.0Ch" on page 335*
1600.0Dh	Mapped object 13 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.0Dh" on page 335*
1600.0Eh	Mapped object 14 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.0Eh" on page 336*
1600.0Fh	Mapped object 15 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.0Fh" on page 336*
1600.10h	Mapped object 16 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.10h" on page 336*
1600.11h	Mapped object 17 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.11h" on page 336*
1600.12h	Mapped object 18 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.12h" on page 337*
1600.13h	Mapped object 19 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.13h" on page 337*
1600.14h	Mapped object 20 in RPDO1	0–2147483647	0	-	Immediately	*" 1600_en.14h" on page 337*
1A00.00h	Number of valid mapping objects of TPDO1	0–20	7	-	Immediately	*" 1A00_en.00h" on page 337*
1A00.01h	Mapped object 1 in TPDO1	0–2147483647	1614872576	-	Immediately	*" 1A00_en.01h" on page 338*
1A00.02h	Mapped object 2 in TPDO1	0–2147483647	1617166336	-	Immediately	*" 1A00_en.02h" on page 338*

Parameter	Name	Setpoint	Default	Unit	Change Method	Page
1A00.03h	Mapped object 3 in TPDO1	0–2147483647	1622736896	-	Immediately	*" 1A00_en.03h" on page 338*
1A00.04h	Mapped object 4 in TPDO1	0–2147483647	1622802432	-	Immediately	*" 1A00_en.04h" on page 339*
1A00.05h	Mapped object 5 in TPDO1	0–2147483647	1622933504	-	Immediately	*" 1A00_en.05h" on page 339*
1A00.06h	Mapped object 6 in TPDO1	0–2147483647	1614741504	-	Immediately	*" 1A00_en.06h" on page 339*
1A00.07h	Mapped object 7 in TPDO1	0–2147483647	1627193344	-	Immediately	*" 1A00_en.07h" on page 339*
1A00.08h	Mapped object 8 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.08h" on page 340*
1A00.09h	Mapped object 9 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.09h" on page 340*
1A00.0Ah	Mapped object 10 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.0Ah" on page 340*
1A00.0Bh	Mapped object 11 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.0Bh" on page 340*
1A00.0Ch	Mapped object 12 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.0Ch" on page 341*
1A00.0Dh	Mapped object 13 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.0Dh" on page 341*
1A00.0Eh	Mapped object 14 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.0Eh" on page 341*
1A00.0Fh	Mapped object 15 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.0Fh" on page 341*
1A00.10h	Mapped object 16 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.10h" on page 342*
1A00.11h	Mapped object 17 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.11h" on page 342*
1A00.12h	Mapped object 18 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.12h" on page 342*
1A00.13h	Mapped object 19 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.13h" on page 342*
1A00.14h	Mapped object 20 in TPDO1	0–2147483647	0	-	Immediately	*" 1A00_en.14h" on page 343*
1C12.00h	Number of assigned PDOs	0–2	1	-	Immediately	*" 1C12_en.00h" on page 343*
1C12.01h	PDO mapping object index of assigned RxPDO1	5632 to 5898	0	-	Immediately	*" 1C12_en.01h" on page 343*

Parameter	Name	Setpoint	Default	Unit	Change Method	Page
1C12.02h	PDO mapping object index of assigned RxPDO2	5632 to 5898	0	-	Immediately	" 1C12_en.02h" on page 343
1C13.00h	Number of assigned PDOs	0 to 2	0	-	Immediately	" 1C13_en.00h" on page 344
1C13.01h	PDO mapping object index of assigned TxPDO1	6656 to 6922	0	-	Immediately	" 1C13_en.01h" on page 344
1C13.02h	PDO mapping object index of assigned TxPDO1	6656 to 6922	0	-	Immediately	" 1C13_en.02h" on page 344
1C32.01h	Sync mode	0 to 65535	0	-	Immediately	" 1C32_en.01h" on page 345
1C32.02h	Cycle time	0 to 4294967295	0	-	Immediately	" 1C32_en.02h" on page 345
1C32.04h	Sync modes supported	0 to 65535	0	-	Immediately	" 1C32_en.04h" on page 345
1C32.05h	Minimum cycle time	0 to 4294967295	0	-	Immediately	" 1C32_en.05h" on page 345
1C33.01h	Sync mode	0 to 65535	0	-	Immediately	" 1C33_en.01h" on page 346
1C33.02h	Cycle time	0 to 4294967295	0	-	Immediately	" 1C33_en.02h" on page 346
1C33.04h	Sync modes supported	0 to 65535	0	-	Immediately	" 1C33_en.04h" on page 346
1C33.05h	Minimum cycle time	0 to 4294967295	0	-	Immediately	" 1C33_en.05h" on page 346

6.22 List of 6000h Object Dictionary

Axis 2 object dictionary requires +0x800 offset.

Example: Axis 2 error code object dictionary: 603Fh + 0x800h = 683Fh

6.22.1 List of 6000h Object Dictionary

Parameter code	Parameter name	Value range	Default value	Unit	Change mode	Page
603Fh	Error code	0 to 65535	0	-	Unchangeable	" 603Fh" on page 347
6040h	Control word	0 to 65535	0	-	Real time	" 6040h" on page 347

Parameter code	Parameter name	Value range	Default value	Unit	Change mode	Page
6041h	Status word	0 to 65535	0	-	Unchangeable	*" 6041h" on page 347*
605Ah	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 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 348*
605Ch	Stop mode at S-OFF	-4: Ramp to stop as defined by 6085h, keeping dynamic braking state -3: at zero speed, 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: Dynamic braking stop, keeping de-energized state	0	-	At stop	*" 605Ch" on page 348*
605Dh	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	1	-	At stop	*" 605Dh" on page 349*

Parameter code	Parameter name	Value range	Default value	Unit	Change mode	Page
605Eh	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 350*
6060h	Servo drive mode	1: Profile position (PP) mode 3: Profile velocity (PV) mode 4: Profile torque (PT) mode 6: Homing (HM) mode 8: CSP mode 9: CSV mode 10: CST mode	0	-	Real time	*" 6060h" on page 350*
6061h	Operation mode display	1: Profile position (PP) mode 3: Profile velocity (PV) mode 4: Profile torque (PT) mode 6: Homing (HM) mode 8: CSP mode 9: CSV mode 10: CST mode	0	-	Unchangeable	*" 6061h" on page 351*
6062h	Position demand value	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 6062h" on page 352*
6063h	Position feedback	-2147483648 to 2147483647	0	Encoder unit	Unchangeable	*" 6063h" on page 352*
6064h	Position feedback	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 6064h" on page 352*
6065h	Following error window	0 to 4294967295	219895608	Reference unit	Real time	*" 6065h" on page 353*

Parameter code	Parameter name	Value range	Default value	Unit	Change mode	Page
6066h	Time lapse to trigger excessive position deviation	0 ms to 65535 ms	0	ms	Real time	*"6066h" on page 353*
6067h	Position window	0 to 4294967295	46976	Reference unit	Real time	*"6067h" on page 353*
6068h	Position window time	0 ms to 65535 ms	0	ms	Real time	*"6068h" on page 354*
606Ch	Velocity actual value	-2147483648 to +2147483647	0	Reference unit/s	Unchangeable	*"606Ch" on page 354*
606Dh	Velocity window	0 RPM to 65535 RPM	10	RPM	Real time	*"606Dh" on page 354*
606Eh	Velocity window time	0 ms to 65535 ms	0	ms	Real time	*"606Eh" on page 355*
606Fh	Zero speed signal threshold	0 RPM to 65535 RPM	10	RPM	Real time	*"606Fh" on page 355*
6070h	Velocity threshold time	0 ms to 65535 ms	0	ms	Real time	*"6070h" on page 355*
6071h	Target torque	-4000 to 4000	0	-	Real time	*"6071h" on page 356*
6072h	Max. torque reference	0 to 4000	3500	-	Real time	*"6072h" on page 356*
6074h	Torque reference	-4000 to 4000	0	-	Unchangeable	*"6074h" on page 356*
6077h	Torque actual value	-4000 to 4000	0	-	Unchangeable	*"6077h" on page 356*
607Ah	Target position	-2147483648 to 2147483647	0	Reference unit	Real time	*"607Ah" on page 357*
607Ch	Home offset	-2147483648 to 2147483647	0	Reference unit	Real time	*"607Ch" on page 357*
607D.01h	Min. position limit	-2147483648 to 2147483647	-2147483648	Reference unit	Real time	*"607D_en.01h" on page 358*
607D.02h	Max. position limit	-2147483648 to 2147483647	2147483647	Reference unit	Real time	*"607D_en.02h" on page 358*
607Eh	Polarity	0 to 127	0	-	Real time	*"607Eh" on page 358*
607Fh	Max. speed	0 to 4294967295	4294967295	Reference unit/s	Real time	*"607Fh" on page 359*
6081h	Profile velocity	0 to 4294967295	111848106	Reference unit/s	Real time	*"6081h" on page 359*
6083h	Profile acceleration	0 to 4294967295	4294967295	Reference unit/s2	Real time	*"6083h" on page 359*

Parameter code	Parameter name	Value range	Default value	Unit	Change mode	Page
6084h	Profile deceleration	0 to 4294967295	4294967295	Reference unit/s^2	Real time	"6084h" on page 360
6085h	Quick stop deceleration	0 to 4294967295	2147483647	Reference unit/s^2	Real time	"6085h" on page 360
6087h	Torque slope	0 to 4294967295	4294967295	-	Real time	"6087h" on page 360
6091.01h	Motor resolution	1 to 4294967295	1	-	At stop	"6091_en.01h" on page 361
6091.02h	Shaft resolution	1 to 4294967295	1	-	At stop	"6091_en.02h" on page 361
6098h	Homing method	-2 to 35	1	-	Real time	"6098h" on page 362
6099.01h	Speed during search for switch	0 to 4294967295	111848106	Reference unit/s	At stop	"6099_en.01h" on page 363
6099.02h	Speed during search for zero	0 to 4294967295	11184810	Reference unit/s	At stop	"6099_en.02h" on page 363
609Ah	Homing acceleration	0 to 4294967295	4294967295	Reference unit/s2	Real time	"609Ah" on page 364
60B0h	Position offset	-2147483648 to 2147483647	0	Reference unit	Real time	"60B0h" on page 364
60B1h	Velocity offset	-2147483648 to +2147483647	0	Reference unit/s	Real time	"60B1h" on page 364
60B2h	Torque offset	-4000 to 4000	0	-	Real time	"60B2h" on page 365
60B8h	Touch probe function	0 to 65535	0	-	Real time	"60B8h" on page 365
60B9h	Touch probe status	0 to 65535	0	-	Unchangeable	"60B9h" on page 366
60BAh	Touch probe 1 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BAh" on page 368
60BBh	Touch probe 1 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BBh" on page 368
60BCh	Touch probe 2 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BCh" on page 368
60BDh	Touch probe 2 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BDh" on page 369
60C5h	Max. acceleration	0 to 4294967295	4294967295	Reference unit/s^2	Real time	"60C5h" on page 369

Parameter code	Parameter name	Value range	Default value	Unit	Change mode	Page
60C6h	Max. deceleration	0 to 4294967295	4294967295	Reference unit/s^2	Real time	*" 60C6h" on page 369*
60D5h	Touch probe 1 positive edge counter	0 to 65535	0	-	Unchangeable	*" 60D5h" on page 369*
60D6h	Touch probe 1 negative edge counter	0 to 65535	0	-	Unchangeable	*" 60D6h" on page 370*
60D7h	Touch probe 2 positive edge counter	0 to 65535	0	-	Unchangeable	*" 60D7h" on page 370*
60D8h	Touch probe 2 negative edge counter	0 to 65535	0	-	Unchangeable	*" 60D8h" on page 370*
60E0h	Positive torque limit	0 to 4000	3500	-	Real time	*" 60E0h" on page 370*
60E1h	Negative torque limit	0 to 4000	3500	-	Real time	*" 60E1h" on page 371*
60F4h	Position deviation	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 60F4h" on page 371*
60FCh	Position demand value	-2147483648 to 2147483647	0	Encoder unit	Unchangeable	*" 60FCh" on page 371*
60FDh	DI state	0 to 4294967295	0	-	Unchangeable	*" 60FDh" on page 372*
60FFh	PV, CSV mode speed reference	-2147483648 to +2147483647	0	Reference unit/s	Real time	*" 60FFh" on page 372*
60FE.01h	Physical output	0 to 4294967295	0	-	Real time	*" 60FE_en.01h" on page 373*
60FE.02h	Physical output enabling	0 to 4294967295	0	-	Real time	*" 60FE_en.02h" on page 373*

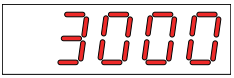
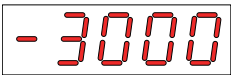
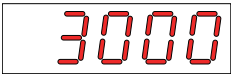
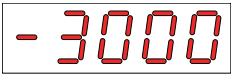
7 Appendix

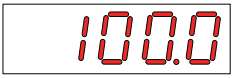
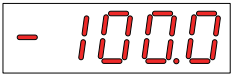
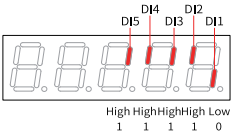
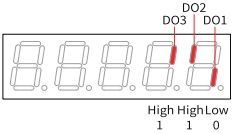
7.1 Display of Monitoring Parameters

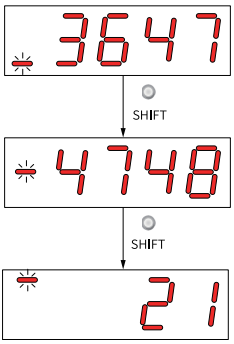
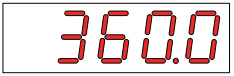
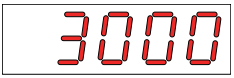
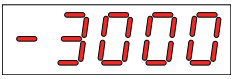
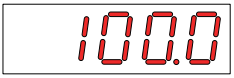
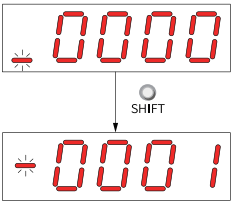
- Group H0b (200b) parameters are used to monitor the operating state of the servo drive. You can enable panel monitoring display by setting H02.32 (2002.21h). The parameter group number displayed is H0b (200b) and the group offset is the value set by H02.32 (2002.21h).
- When H02.32 is set to a valid group offset, the motor enters the state display mode when the motor is at a standstill and enters the parameter display mode when the motor is in the rotating state. The mode switchover is irrelevant to the S-ON signal of the servo.
  V09XXX software version: When the speed feedback is 0, the motor is in the static state. Otherwise, the motor is in the rotating state.

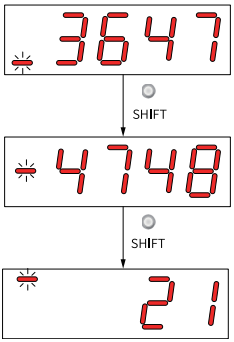
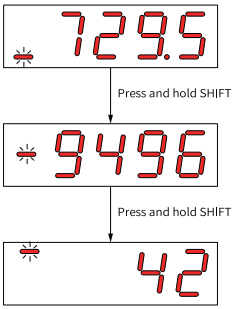
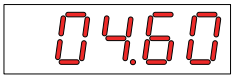
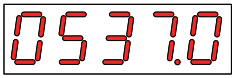
  V102XX software version: When the zero speed signal is active (speed feedback < 606Fh for the time duration specified by 6070h), the motor is at a standstill. Otherwise, the motor is in the rotating state.
- For example, H02.32 (2002.21h) is set to 00. When the motor changes from the static state to the rotating state, the display switches from the status display mode to the parameter display mode, and the display displays the parameter value of H0b.00 (200b.00h).

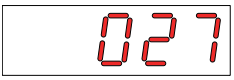
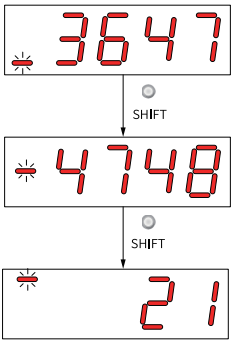
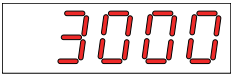
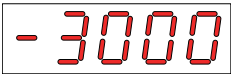
The following table describes the monitoring parameters in group H0b.

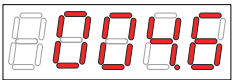
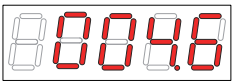
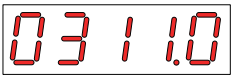
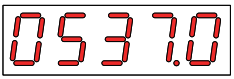
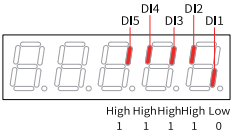
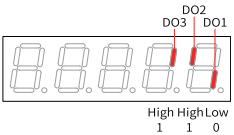
Parameter code	Parameter name	Unit	Description	Example
H0b.00	Actual motor speed	RPM	The actual motor speed after round-off is displayed. The speed is accurate to 1 RPM.	Display of 3,000 RPM:  Display of -3,000 RPM: 
H0b.01	Speed reference	RPM	Displays the present speed reference of the servo drive.	Display of 3,000 RPM:  Display of -3,000 RPM: 

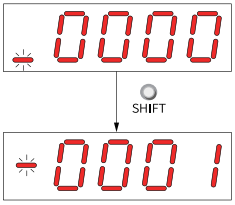
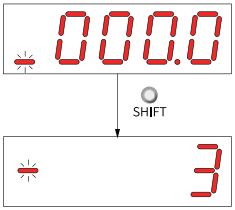
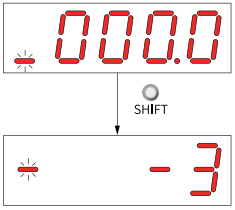
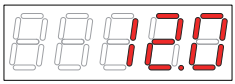
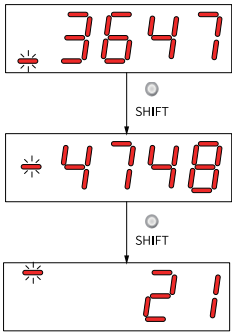
Parameter code	Parameter name	Unit	Description	Example
H0b.02	Internal torque reference	%	Displays the ratio of actual torque output of the motor to the rated torque of the motor.	Display of 100.0%:  Display of -100.0%: 
H0b.03	Input (DI) signal monitoring	-	Indicates the level status of DI1 to DI5: Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0") H0b.03 value read by the software tool is a decimal.	For example, if DI1 is at a low level and DI2 to DI5 are at high levels: The corresponding binary value is "11110", and the value of H0b.03 read in the software tool is 0x001E. Display on the operating panel: 
H0b.05	Output (DO) signal monitoring	-	Indicates the level status of DO1 to DO3: Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0") H0b.05 value read by the software tool is a decimal.	For example, if DO1 is at a low level and DO2 to DO3 are at high levels: the binary value is "110". The value of H0b.05 read in the software tool is 0x0006. Display on the operating panel: 

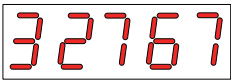
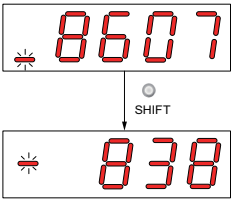
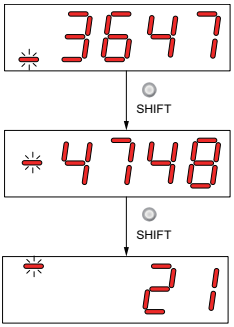
Parameter code	Parameter name	Unit	Description	Example
H0b.07	Absolute position counter (32-bit decimal)	Reference unit	Indicates the current absolute position of the motor (in reference unit).	Display of 1073741824: 
H0b.09	Mechanical angle	°	Displays current mechanical angle of the motor.	Display of 360.0°: 
H0b.10	Rotation angle (electrical angle)	°	Displays current electrical angle of the motor.	Display of 360.0°: 
H0b.11	Speed corresponding to the input position reference	RPM	Displays the speed corresponding to the position reference per control cycle of the servo drive.	Display of 3,000 RPM:  Display of -3,000 RPM: 
H0b.12	Average load ratio	%	Indicates the percentage of the average load torque to the rated torque of the motor.	Display of 100.0%: 
H0b.15	Encoder position deviation counter (32-bit decimal display)	Encoder unit	Encoder position deviation = Sum of input position references (encoder unit) – Sum of pulses fed back by the encoder (in encoder unit)	Display of 10000 in encoder unit: 

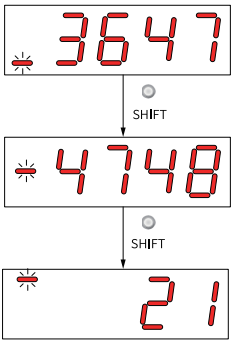
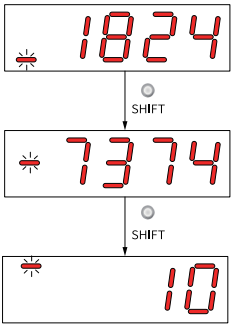
Parameter code	Parameter name	Unit	Description	Example
H0b.17	Feedback pulse counter (32-bit decimal display)	Encoder unit	Counts and displays the number of pulses fed back by the encoder (in encoder unit). ***Note*** When a motor with an absolute encoder is used, H0b.17 only reflects the values of the low 32 bits of the motor position feedback. To obtain the actual motor position feedback, view H0b.77 (Encoder position with low 32 bits) and H0b.79 (Encoder position with high 32 bits).	Display of 1073741824 in encoder unit: 
H0b.19	Total power-on time (32-bit decimal)	s	Counts and displays the total power-on time of the servo drive.	Display of 429496729.5s: 
H0b.24	Phase current RMS value	A	Displays the RMS value of the phase current of the servo motor.	Display of 4.60 A: 
H0b.26	Bus voltage	V	Indicates the DC bus voltage of the main circuit, namely the voltage between terminals P ⊕ and NΘ.	Display of 311.0 V rectified from 220 VAC:  After 380 V AC rectification, 537.0 V is displayed as follows: 

Parameter code	Parameter name	Unit	Description	Example
H0b.27	Module temperature	℃	Displays the temperature of the power module inside the servo drive.	Display of 27℃: 
H0b.33	Fault log	-	Set the number of historical faults to be viewed. 0: Current fault 1: Last fault 2: 2nd to last fault ... 9: 9th to last fault	0: Display of current fault: 
H0b.34	Fault code of the selected fault	-	H0b.33 is used to set the number of historical faults to be viewed, and H0b.34 is used to display the faults. When no fault occurs, the displayed value of H0b.34 is E000.0.	If H0b.33 is 0 and H0b.34 is E941.0, the current fault code is 941.0. Display: 
H0b.35	Timestamp of the selected fault	s	Indicates the total servo operating time when the selected fault occurred. When no fault occurs, the displayed value of H0b.35 is 0.	If H0b.34 is E941.0 and H0b.35 is 107374182.4, the current fault code is 941.0 and the total operating time of the servo drive is 107374182.4s when the fault occurs. 
H0b.37	Motor speed upon when the selected fault occurred	RPM	The motor speed when the selected fault occurred. When no fault occurs, the displayed value of H0b.37 is 0.	Display of 3,000 RPM:  Display of -3,000 RPM: 

Parameter code	Parameter name	Unit	Description	Example
H0b.38	Motor phase U current when the selected fault occurred	A	Indicates the phase U winding current effective value of the motor when the selected fault occurred. When no fault occurs, the displayed value of H0b.38 is 0.	Display of 4.60 A: 
H0b.39	Motor phase V current when the selected fault occurred	A	Indicates the phase V winding current effective value of the motor when the selected fault occurred. When no fault occurs, the displayed value of H0b.39 is 0.	Display of 4.60 A: 
H0b.40	Bus voltage upon occurrence of the selected fault	V	Indicates the DC bus voltage of the main circuit when the selected fault occurred. When no fault occurs, the displayed value of H0b.40 is 0.	Display of 311.0 V rectified from 220 VAC:  After 380 V AC rectification, 537.0 V is displayed as follows: 
H0b.41	Input terminal state when the selected fault occurred	-	Displays the high and low level status of DI1 to DI5 when the selected fault 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).	For example, when the value of H0b.41 read in the software tool is 0x0001, the corresponding binary code is 0000 0000 0000 0001. 
H0b.43	Output terminal status when the selected fault occurred	-	Displays the high and low level status of DO1 to DO3 when the selected fault occurred. View this parameter in the same way as viewing 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.43 = 0x0003: 

Parameter code	Parameter name	Unit	Description	Example
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: 
H0b.55	Actual motor speed	0.1 RPM	IIndicates the actual motor speed, which is accurate to 0.1 RPM.	Display of 3,000.0 RPM:  Display of -3,000.0 RPM: 
H0b.57	Control circuit voltage	V	Displays the DC voltage of the control circuit.	Display of 12.0 V: 
H0b.58	Mechanical absolute position (low 32 bits)	Encoder unit	Displays the mechanical absolute position (low 32 bits) when an absolute encoder is used.	Display of 2147483647 in encoder unit: 

Parameter code	Parameter name	Unit	Description	Example
H0b.60	Mechanical absolute position (high 32 bits)	Encoder unit	Displays the mechanical absolute position (high 32 bits) when an absolute encoder is used.	Display of 32767: 
H0b.70	Number of absolute encoder revolutions	Rev	Displays the present number of revolutions of the absolute encoder.	Display of 32767: 
H0b.71	Single-turn position feedback of an absolute encoder	Encoder unit	Displays the single-turn position feedback of the absolute encoder.	Display of 8388607 in encoder unit: 
H0b.77	Absolute encoder position (low 32 bits)	Encoder unit	Displays the absolute position (low 32 bits) of the motor when the absolute encoder is used.	Display of 2147483647 in encoder unit: 
H0b.79	Absolute encoder position (high 32 bits)	Encoder unit	Displays the absolute position (high 32 bits) of the motor when the absolute encoder is used.	Display of -1 in encoder unit: 

Parameter code	Parameter name	Unit	Description	Example
H0b.81	Single-turn position feedback of the load in rotation mode (low 32 bits)	Encoder unit	Displays the position feedback (low 32 bits) of the mechanical load when the absolute system works in the rotation mode.	Display of 2147483647 in encoder unit: 
H0b.83	Single-turn position feedback of the load in rotation mode (high 32 bits)	Encoder unit	Displays the position feedback (high 32 bits) of the mechanical load when the absolute system works in rotation mode.	Display of 1 in encoder unit: 
H0b.85	Single-turn position of the load in rotation mode	Reference unit	Displays the mechanical absolute position when the absolute system works in rotating mode.	Example: 1073741824 in referent unit 

7.2 DIDO Function Assignment

Code	Name	Function	Description	Remarks
Description of DI signals				
FunIN.1	S-ON	Servo ON	Disabled: Servo motor disabled Enabled: Servo motor enabled	The corresponding terminal logic must be level-triggered. Changes to the corresponding DI/VDI or terminal logic are applied at the next power-on.

Code	Name	Function	Description	Remarks
FunIN.2	ALM-RST	Alarm reset signal	Inactive: Disabled Active: Enabled	Edge-triggered will be applied even if "level-triggered" is selected. To reset No. 1 and No.2 resettable faults, switch off the S-ON signal first. The servo drive may, depending on the alarm type, continue operating after reset.
FunIN.14	P-OT	Positive limit switch	Enabled: Forward drive inhibited Disabled: Forward drive permitted	Overtravel prevention applies when the machine moves beyond the limit. It is recommended that the corresponding terminal logic is level-triggered.
FunIN.15	N-OT	Negative limit switch	Overtravel prevention applies when the load moves beyond the limit. Active: Reverse drive inhibited Inactive: Reverse drive allowed	The corresponding terminal logic is recommended to be level-triggered.
FunIN.31	HomeSwitch	Home switch	Inactive: The switch is not triggered Enabled: The switch is triggered.	The corresponding terminal logic must be level-triggered. It is recommended to assign this function to a high-speed DI terminal. If the logic is set to 2 (rising edge active), the servo drive forcibly changes it to 1 (active high). If the logic is set to 3 (falling edge active), the servo drive forcibly changes it to 0 (active low). If the logic is set to 4 (both rising edge and falling edge active), the servo drive forcibly changes it to 0 (low level active).
FunIN.34	Emergency Stop	Emergency stop	Enabled: Position lock is applied after stop at zero speed. Disabled: Current operating state remains unaffected.	The corresponding terminal logic is recommended to be level-triggered.
FunIN.38	TouchProbe1	Touch probe 1	Disabled: Touch probe is not triggered. Enabled: Touch probe is triggerable.	The touch probe logic is only related to the touch probe function (60B8h).
FunIN.39	TouchProbe2	Touch probe 2	Disabled: Touch probe is not triggered. Enabled: Touch probe is triggerable.	The touch probe logic is related only to the touch probe function (60B8h).

Code	Name	Function	Description	Remarks
Description of DO signals				
FuNoUT.1	S-RDY	Ready to switch on	The servo drive is ready to receive the S-ON signal. Enabled: The servo drive is ready. Disabled: The servo drive not ready.	-
FuNoUT.2	TGON	Motor rotation signal	Inactive. Absolute value of filtered motor speed is lower than the setpoint of H06.16. Active. Absolute value of filtered motor speed reaches the setpoint of H06.16.	-
FuNoUT.9	BK	Brake output	Inactive: The brake power supply is switched off and the brake applies. In this case, the motor is locked. Active: The brake power supply is switched on and the brake is released. In this case, the motor can rotate.	-
FuNoUT.10	WARN	Warning	Enabled: The servo drive issued a warning. Disabled: The servo drive issued no warning or the warning has been reset.	-
FuNoUT.11	ALM	Fault	The servo drive is faulty. Inactive: No fault occurred on the servo drive or the fault has been reset.	-
FuNoUT.25	CMP	Comparison output	Enabled: The servo drive passes the target position comparison point. Inactive: The servo drive does not pass the target position comparison point.	-
FuNoUT.31	EtherCAT forced DO in non-operational status		For details, see *"Table 7-1 Description of EtherCAT forced DO in non-operational status" on page 486*	-
FuNoUT.32	EDM	EDM output	Enabled: STO is triggered Disabled: STO is not triggered	The EDM outputs active signals only when both the 24 V input voltages for STO1 and STO2 are disconnected at the same time.

Table 7–1 Description of EtherCAT forced DO in non-operational status

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

This table describes the setpoints of H04.23 (EtherCAT communication forced DO logic in non-OP status).

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