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SV670C Series Servo Drive

Function Guide

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

Data code 19011859 A03

Preface

Introduction

Thank you for purchasing the SV670C series servo drive developed by Inovance.

The SV670C series servo drive is a high-end servo drive designed based on global-leading standards and high-end application needs. It is featured with high speed, high precision, high performance, and tuning-free Function.

The servo drive, which covers a power range from 0.05 kW to 7.5 kW, supports Modbus, CANopen and CANlink communication protocols and carries necessary communication interfaces to operate with the host controller for a networked operation of multiple servo drives. The drive comes with the ITune function which supports adaptive stiffness level setting, inertia auto-tuning, and vibration suppression for easy use. The SV670P series servo drive, together with an MS1 series high-response servo motor (with ultra-low, low or medium inertia) equipped with a 23-bit single-turn/multi-turn absolute encoder, aims to deliver quiet and stable operation and accurate process control through the fully closed-loop function and internal process segment function.

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

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

More Documents

Name	Data Code	Description
SV670P Series Servo Drive Hardware Guide	19011854	Provides wiring instructions, including a system wiring diagram, cable selection recommendation, terminal layout, pin assignment and terming wiring.
SV670P Series Servo Drive Commissioning Guide	19011856	Presents servo commissioning, parameter descriptions, including the operating panel, commissioning software, commissioning procedure and a parameter list.
SV670C Series Servo Drive Function Guide	19011859	Presents functions and parameters, including function overview, basic servo functions, adjustment and parameter list.

Name	Data Code	Description
SV670P Series Servo Drive Communication Guide	19011871	Presents functions and parameters of the servo drive, including Modbus communication configuration, parameter descriptions, and communication application cases.
SV670P Series Servo Drive installation Guide	19011868	Describes installation and wiring of the servo drive, including preparations before installation, unpacking inspection and transportation, mechanical installation and electrical installation.
SV670P Series Servo Drive Troubleshooting Guide	19011869	Introduces faults and fault levels, the troubleshooting process, warning codes and fault codes.
SV670P Series Servo Drive Maintenance Guide	19011870	Provides instructions on maintenance and repair of the equipment.
SV670P Series Servo Drive Manual Package	PS00005526	Provides information on selection, installation, commissioning, function, troubleshooting and parameters of the equipment.

Revision History

Date of Revision	Version	Description
2023-01	A03	• Added warranty information in the preface. • Added information on H02.42, H02.48 and H0b.98. • Optimized information on H05.35, H05.38, H08.31, H09.26 and H0b.63.
2022-08	A02	• Changed the introduction in the Preface. • Added “6098h=-3” in the description of homing.
2022-07	A01	• Updated description of some parameters. • Updated the product image on the front cover.
2022-03	A00	First release.

Document Acquisition

This manual is not delivered with the product. You can obtain the PDF version in either of the following ways:

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

Warranty

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. You will be charged for any repair work after the warranty period expires.

Within the warranty period, you will be charged if the product is damaged due to the following causes.

- Failure to operate this product as specified in this guide.
- Fire, flood, or abnormal voltage.
- Unintended use of the product.
- Operation beyond the product's ratings.
- 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 details, see Product Warranty Card.

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General Safety Instructions

Safety Precautions

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

Safety Levels and Definitions

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

General Safety Instructions

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

Unpacking



- 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 by following the unpacking sequence. Do not strike the package violently.
- Check whether there is damage, rust, or injuries on the surface of the equipment and equipment accessories before unpacking.
- Check whether the package contents are consistent with the packing list before unpacking.

Storage and Transportation



- Large-scale or heavy equipment must be transported by qualified professionals using specialized hoisting equipment. Failure to comply may result in personal injuries or equipment damage.
- Before hoisting the equipment, ensure the equipment components such as the front cover and terminal blocks are secured firmly with screws. Loosely-connected components may fall off and result in personal injuries or equipment damage.
- Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment.
- When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.



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

Installation



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



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



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

Wiring



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



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



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

Power-on



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



- Perform a trial run after wiring and parameter setting to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage.
- Before power-on, make sure that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may resulting in a fire. Failure to comply may result in a fire.
- Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in death or personal injuries.

Operation



- The equipment must be operated only by professionals. Failure to comply will result in death or personal injuries.
- Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply will result in an electric shock.



- Do not touch the equipment casing, fan, or resistor with bare hands to feel the temperature. Failure to comply may result in personal injuries.
- Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.

Maintenance



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



- Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

Repair



- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not repair the equipment with power ON. Failure to comply will result in an electric shock.
- Before inspection and repair, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.



- Submit the repair request according to the warranty agreement.
- When the fuse is blown or the circuit breaker or earth leakage current breaker (ELCB) trips, wait for at least the time designated on the equipment warning label before power-on or further operations. Failure to comply may result in death, personal injuries or equipment damage.
- When the equipment is faulty or damaged, the troubleshooting and repair work must be performed by professionals that follow the repair instructions, with repair records kept properly.
- Replace quick-wear parts of the equipment according to the replacement instructions.
- Do not use damaged equipment. Failure to comply may result in death, personal injuries, or severe equipment damage.
- After the equipment is replaced, check the wiring and set parameters again.

Disposal



- Dispose of retired equipment in accordance with local regulations and standards. Failure to comply may result in property damage, personal injuries, or even death.
- Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution.

Additional Precautions

Cautions for the dynamic brake

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

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

Safety Label

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

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

1 Function Overview

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

Function	Description
Position control mode	Used to make the servo drive operate in the position control mode.
Speed Control Mode	Used to make the servo drive operate in the speed control mode.
Torque control mode	Used to make the servo drive operate in the torque control mode.
Position/Speed control switchover mode	Used to switch between position control and speed control through external input signals.
Speed/Torque control switchover mode	Used to switch between speed control and torque control through external input signals.
Torque/Position control switchover mode	Used to switch between torque control and position control through external input signals.
Torque/Speed/ Position control switchover mode	Used to switch among torque control, speed control and position control through external input signals.
High-resolution encoder	The servo drive is equipped with a high-performance encoder with resolution up to 2^{23} (8388608) PPR.
Electronic Gear Ratio	Input pulse can be reduced or amplified: 0.001–4000 × Encoder resolution / 10000).
Position Reference Filter	Used to achieve smooth acceleration and deceleration.
Interrupt positioning	Used to interrupt present position reference and execute the set displacement.
Frequency-Division Output	Used to output the position reference pulses or the position pulses fed back by the encoder in the form of phase A/phase B quadrature pulses.
Homing	Used to search for the mechanical home automatically to locate the relative position between the mechanical home and mechanical zero
Zero Clamp	Used to keep the motor speed below a certain value in the speed control mode to lock the position.
DI signal assignment	Used to assign functions such as S-ON to corresponding pins.
Forced DO	Used to output signals not related to the drive status forcibly or used to check the wiring of output signals.
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.
External regenerative resistor	Used in case of insufficient braking capacity of the built-in regenerative resistor.
Fault log	Used to record the latest twenty faults/warnings, which can also be cleared.

Function	Description
Warning code output	Used to output a four-bit warning code when a warning occurs.
AI, AO	Supports AI and AO.
Position comparison output	Used to output a DO signal with designated pulse width after the drive reaches the preset target position.
Black box	Used to capture the data before and after the designated condition and cooperates with the software tool to read the data for further analysis.
STO function	The safe torque off (STO) function brings the machine safely into a no-torque state and prevents it from unexpected start.
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.
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	Supports three auto-tuning modes: STune, ETune, and ITune.
Gain switchover	Used to apply different gains to different status (operating or stop) of the motor. Gains can also be switched by external terminals during operation.
Torque disturbance observer	Used to estimate the disturbance torque suffered by the system and make corresponding compensation.
Resonance suppression	Used to suppress resonance at high, medium, and low frequencies.
Torque Reference Filter	Used to suppress the mechanical resonance that may be generated when the response speed is excessively high.

2 Basic Functions of the Servo Drive

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

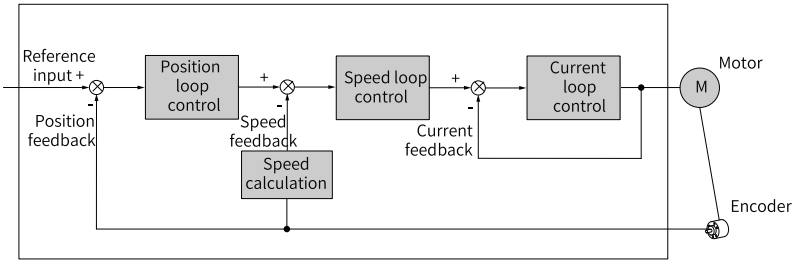


Figure 2-1 Structure of a basic servo system

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 and speed control through the encoder installed on the motor or an external encoder (full closed-loop control). 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 (encoder unit) corresponding to the load shaft displacement of one reference unit.

The gear ratio is comprised of the numerator 6091.01h and 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.

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

☆Related parameters

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6091.01h	6091-01h	Motor resolution	1 to 4294967295	1	-	At stop	" 6091_en.01h" on page 445
6091.02h	6091-02h	Shaft resolution	1 to 4294967295	1	-	At stop	" 6091_en.02h" on page 445

Taking the 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 motor equipped with 23-bit serial-type encoder (P) = 8388608 PPR

The position factor is therefore 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 = 4194304; 6091.02h = 1. That means when the load shaft displacement is 1 mm, the motor displacement is 4194304.

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 State

Abide by the process stipulated in the CiA402 protocol when operating the SV670C servo drive. Otherwise, the servo drive cannot run in the designated status.

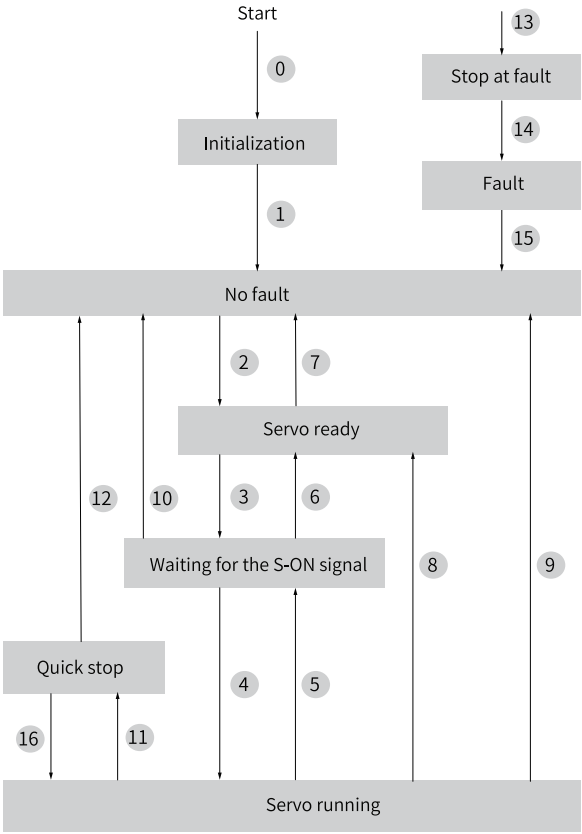


Figure 2-2 Switchover of CiA402 state machine

See the following table for descriptions of different status.

Initialization	Initialization of the servo drive and internal self-inspection are done. Parameters cannot be set. Drive functions cannot be executed.
No fault	No fault exists in the servo drive or the fault has been cleared. Parameters can be set.
Servo ready	The servo drive is ready to run. Parameters can be set.
Waiting for the S-ON signal	The servo drive is waiting for the S-ON signal. Parameters can be set.

Servo ON	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 Status 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
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

CiA402 Status Switchover		Control word 6040h	bit0 to bit9[1] of status word 6041h
11	Servo running → Quick stop	0x0002	0x0217
12	Quick stop → No fault	Quick stop mode 605Ah can be set to 0 to 3. The process is performed automatically 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.

2.2.1 Control word 6040h

6040h **Control word**

Address: -

Min.: 0 Unit: -

Max.: 65535 Data Type: Uint16

Default: -
Change: During running
At once
Access: RW
Mapping: RPDO

Value Range:
0 to 65535
Description:
Defines the control command.

bit	Name	Description
0	Switch on	1: Active, 0: Inactive
1	Enable voltage	1: Active, 0: Inactive
2	Quick stop	0: Active, 1: Inactive
3	Enable operation	1: Active, 0: Inactive
4 to 6	Operation mode specific	Related to the operation mode of the servo drive.
7	Fault Reset	0: Inactive 0→1: Fault reset is available only for faults and warnings that can be reset. 1: Other control commands are ineffective 1→0: Ineffective
8	Halt	1: Active, 0: Inactive
9	Operation mode specific	Related to the servo drive operation mode.
10	Reserved	Undefined
11 to 15	Manufacturer-specific	Manufacturer-specific

Note

- All bits in the control word constitute a control command.
- The meanings of bit0...bit3 and bit7 are the same in each mode. The servo drive switches to the preset status according to the CiA402 state machine switchover process only when commands are sent in sequence. Each command corresponds to a certain status.
- bit4...bit6 are related to each mode (see the control commands in different modes for details).
- bit9 is not defined.

2.2.2 Status Word 6041h

6041h Status word
Address: -
Min.: -
Unit: -

Max.: - Data Type: Uint16
Default: - Change: -
Access: RO Mapping: TPDO

Value Range:

-

Description:

Indicates the servo drive status.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
ms		oms		ila	tr	rm	ms	w	sod	qs	ve	f	oe	so	rtso
MSB															LSB

Note: ms=manufacturEr-specific; oms=operation mode sPecific; ila=internal limit actIve; tr=target rEach; rm=remote; w=warning; sod=switch on disabled; qs=quick stop; ve=voltage enabled; f=fault; oe=operation enabled; so=switch on; rtso=ready to switch on

Table 2–1 Description of each bit of 6041h

bit	Name	Description
0	Ready to switch on	1: Active, 0: Inactive
1	Switch on	1: Active, 0: Inactive
2	Operation enabled	1: Active, 0: Inactive
3	Fault	1: Active, 0: Inactive
4	Voltage enabled	1: Active, 0: Inactive
5	Quick stop	0: Active, 1: Inactive
6	Switch on disabled	1: Active, 0: Inactive
7	Warning	1: Active, 0: Inactive
8	Manufacturer-specific	Undefined
9	Remote	1: Active, control word activated 0: Inactive
10	Target reach	1: Active, 0: Inactive
11	Internal limit active	1: Active, 0: Inactive
12 to 13	Operation mode specific	Related to the servo drive operation mode.
14	Manufacturer-specific	Undefined
15	Home Find	1: Active, 0: Inactive

Table 2–2 Descriptions of setpoints of 6041h

Binary Value	Description
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switched on

Binary Value	Description
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

Note

- Meanings of bit0 to bit9 are the same in each mode of operation. After commands are sent in sequence by the control word 6040h, the servo drive feeds back the acknowledged status.
- Meanings of bit12 and bit13 vary with the mode of operation. For details, see parameters related to each mode.
- Meanings of bit10, bit11, and bit15 are the same in each mode of operation and indicate the servo drive status after a certain mode of operation is implemented.

2.3 Setting and Display of the Operation Modes

Introduction to the operation modes

The pre-operational mode of the servo drive is set in 6060h. The current operation mode of the servo drive can be viewed in 6061h.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6060h	6060h	Modes of operation	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Immediately	*" 6060h" on page 433*
6061h	6061h	Operation mode display	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Unchangeable	*" 6061h" on page 434*

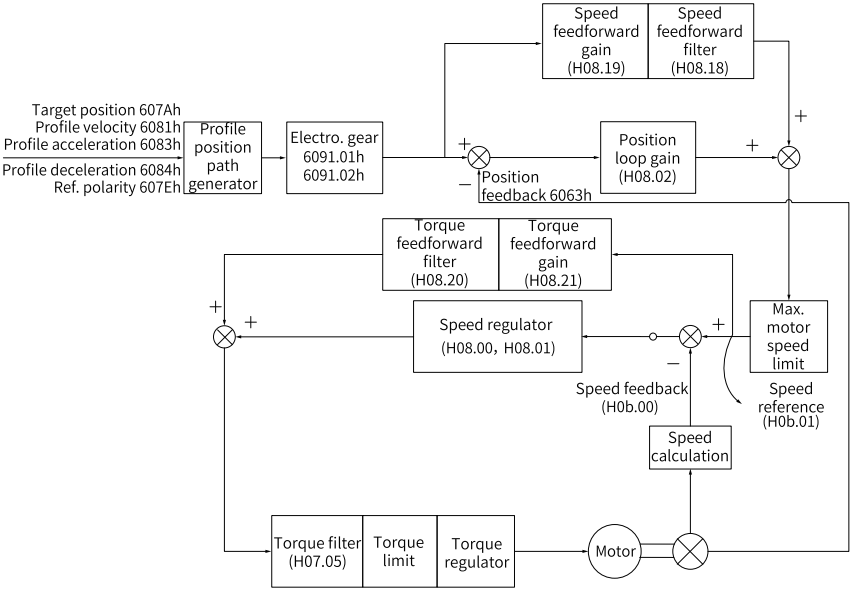
Communication cycle supported by each mode

The SV670C series servo drive supports a synchronization cycle of 1 ms or an integer multiple of 1 ms. The maximum synchronization cycle is 20 ms.

2.4 Profile Position (PP) Mode

The PP mode mainly applies to point-to-point positioning. In PP mode, the host controller sets the target position, operating speed, acceleration rate, and deceleration rate. The position profile generator inside the servo drive generates position profiles based on preceding settings, and the servo drive executes position control, speed control, and torque control.

2.4.1 Function Block Diagram



2.4.2 Configuration Block Diagram

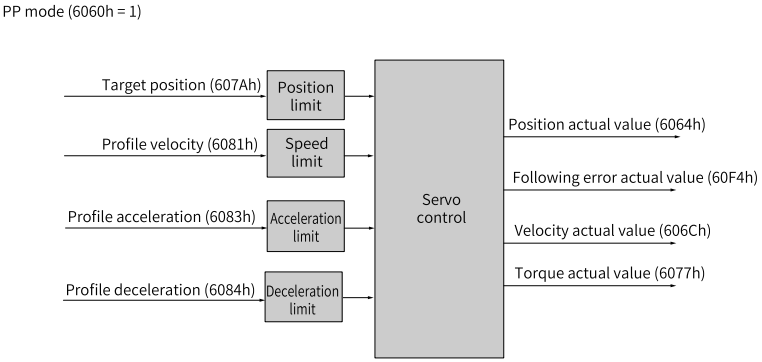


Figure 2-3 PP mode

In PP 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.

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 the New set-point bit to 1, and the servo drive performs 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.

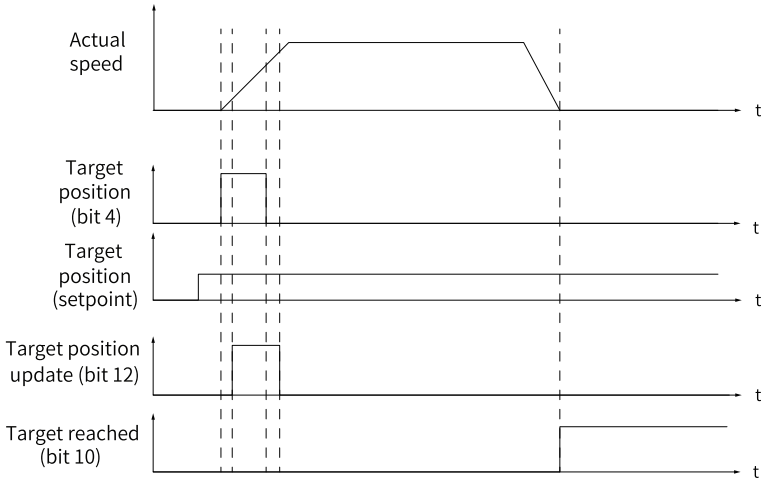


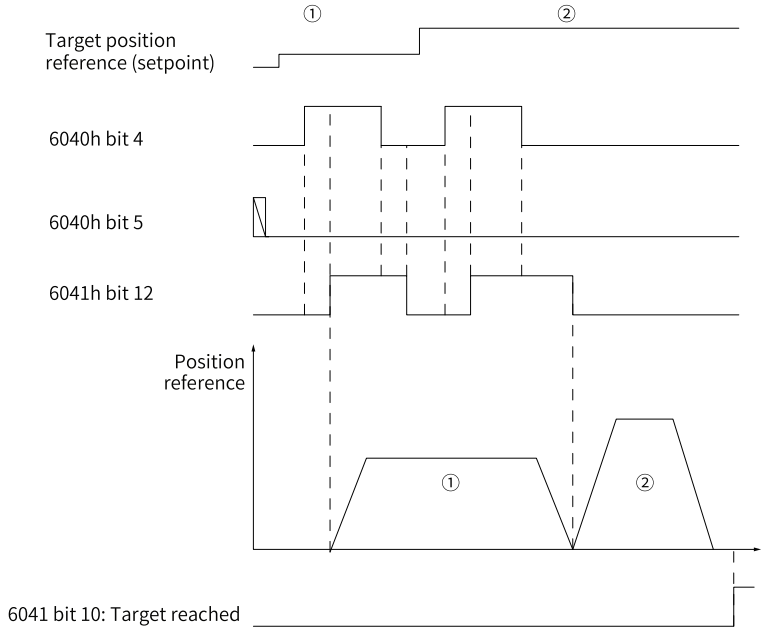
Figure 2-4 Sequence in sequential mode

Single-point mode:

The target position of current segment is in the process of positioning. After the new target position is generated, the controller sets the New set-point bit to 1, and the

servo drive performs positioning towards the new target position after the position reference of current segment is done transmitting.

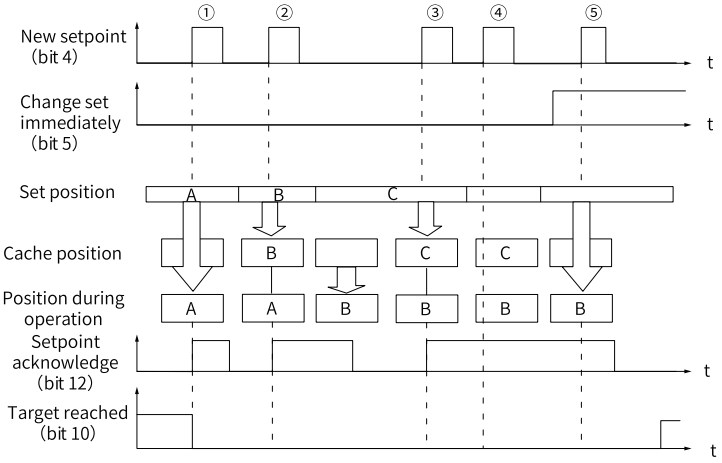
The time sequence diagram of the new set-point (bit4 of the control word) and the set-point acknowledge (bit12 of the status word) is as follows.



Note: To modify any parameter of the target position reference (setpoint), send the target position bit (bit 4) again.

Figure 2-5 Sequence in the single-point mode

In the 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 executed immediately.
- ②③ If a position reference is under execution currently, the new position setpoint will be saved in the cache. After current position reference is done transmitting, 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 full. In this case, you can set the attribute bit (Change set immediately) of the set value to 1 to activate the set value.

2.4.3 Recommended Configuration

The basic configuration for 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

2.4.4 Related Parameters

6040h **Control word**

Address: -

Min.: 0 Unit: -

Max.: 65535 Data Type: Uint16

Default: -
Change: During running
At once
Access: RW
Mapping: RPDO

Value Range:

-

Description:

Defines the control command.

bit	Name	Description
0	Switch on	1: Active, 0: Inactive
1	Enable voltage	1: Active, 0: Inactive
2	Quick stop	0: Active, 1: Inactive
3	Enable operation	1: Active, 0: Inactive
4	New set-point	0→1: Trigger new target position 1→0: clear bit12 of the status word
5	Change set immediately	0: Not immediately 1: Immediately
6	abs/rel	0: abs 1: rel
7	Halt	0: Keep running 1: Halt

6041h Status word

Address: -
Min.: -
Unit: -
Max.: -
Data Type: Uint16
Default: -
Change: -
Access: RO
Mapping: TPDO

Setpoint:

-

Description:

Indicates the servo drive status.

bit	Name	Description
0	Ready to switch on	1: Active, 0: Inactive
1	Switch on	1: Active, 0: Inactive
2	Operation enabled	1: Active, 0: Inactive
3	Fault	1: Active, 0: Inactive
4	Voltage enabled	1: Active, 0: Inactive
5	Quick stop	0: Active, 1: Inactive
6	Switch on disabled	1: Active, 0: Inactive

bit	Name	Description
7	Warning	1: Active, 0: Inactive
8	Manufacturer-specific	Undefined
9	Remote	1: Active, control word activated 0: Inactive
10	Target reach	0: The target position is not reached. 1: The target position is reached.
11	Internal limit active	0: Position reference within the limit 1: Position reference beyond the limit
12	Set-point acknowledge	0: Acknowledged 1: Not acknowledged
13	Following error	0: No error 1: Excessive deviation
14	Manufacturer-specific	Undefined
15	Homing completed	0: Homing not done 1: Homing done

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6060h	6060h	Modes of operation	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Immediately	*" 6060h" on page 433*
6064h	6064h	Position actual value	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 6064h" on page 435*
607Ah	607Ah	Target position	-2147483648 to 2147483647	0	Reference unit	Immediately	*" 607Ah" on page 440*
6081h	6081h	Profile velocity	0 to 4294967295	13981013	Reference unit/s	Immediately	*" 6081h" on page 443*
6083h	6083h	Profile acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	*" 6083h" on page 443*
6084h	6084h	Profile deceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	*" 6084h" on page 443*

2.4.5 Related Functions

Positioning completed

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6067h	6067h	Position window	0 to 4294967295	5872	Reference unit	Immediately	*"6067h" on page 436*
6068h	6068h	Position window time	0 ms to 65535 ms	0	ms	Immediately	*"6068h" on page 436*

Note

6067h only reflects the threshold of absolute position deviation when positioning is done. It is not related to the positioning accuracy.

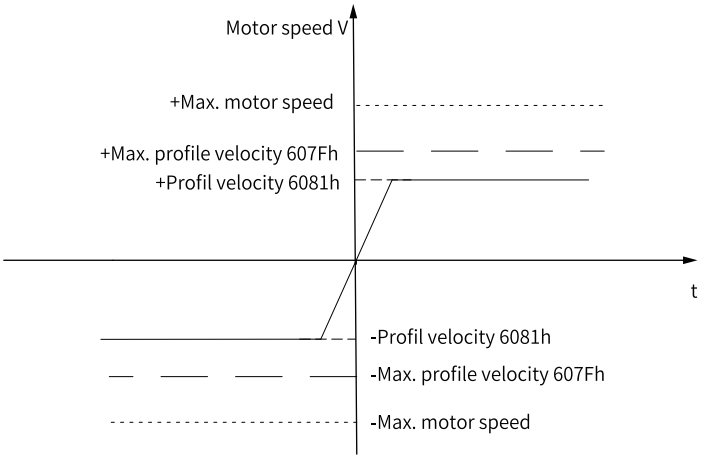
Position deviation monitoring function

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6065h	6065h	Following error window	0 to 4294967295	27486951	Reference unit	Immediately	*"6065h" on page 435*
6066h	6066h	Following error time out	0 ms to 65535 ms	0	ms	Immediately	*"6066h" on page 436*

Speed limit

In PP mode, 607Fh can be used to limit the maximum speed in forward/reverse operation. Note that the maximum speed cannot exceed the maximum running speed allowed by the motor.



☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Fh	607Fh	Max. profile velocity	0 to 4294967295	838860800	Reference unit/s	Immediately	*"607Fh" on page 442*

Acceleration and deceleration limits

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6083h	6083h	Profile acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	*"6083h" on page 443*
6084h	6084h	Profile deceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	*"6084h" on page 443*

Reference polarity

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Eh	607Eh	Reference polarity	0 to 127	0	-	Immediately	*" 607Eh" on page 442*

2.5 Interpolated position (IP) mode

The interpolation mode can be used to achieve synchronous operations of multi-axis servo drives or single-axis servo drives. When the servo drive is not enabled, after the host controller sets the interpolation cycle, the displacement curve is planned in advance according to actual application requirements. When the servo drive is running, different absolute position points on the displacement curve are periodically sent to the slave. The slave synchronously receives the displacement reference, subdivides and evenly transmits the displacement reference increment based on the position loop control cycle. The servo drive executes the position control, speed control, and torque control.

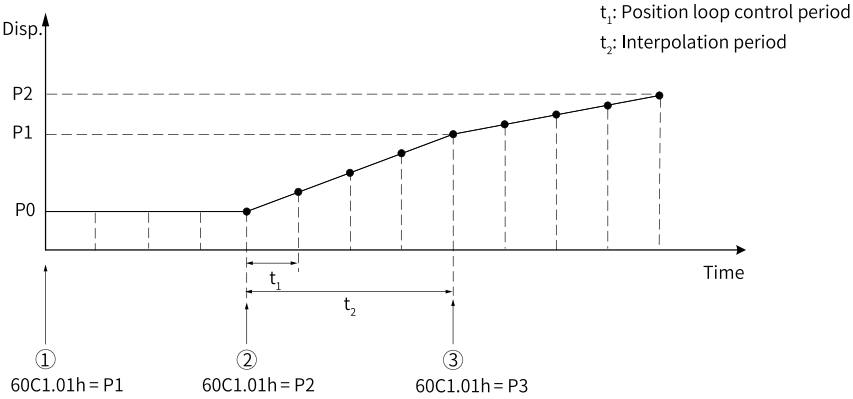
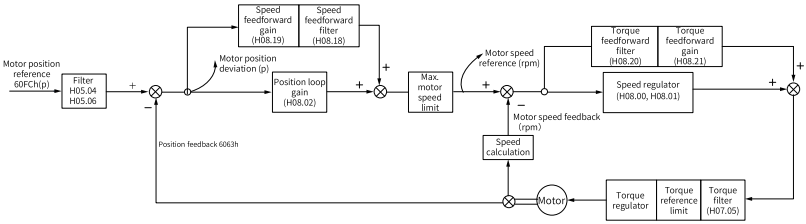


Figure 2-6 Displacement curve of single-axis linear interpolation motor

Note

- 1: The current absolute position of the motor is P0. After receiving the first absolute position reference P1, planning of the first displacement profile starts.
- 2: The current absolute position of the motor is P0. The motor starts to operate towards the first absolute position P1 and receives the second absolute position reference P2 at the same time, after which, planning of the second displacement profile starts.
- 3: After reaching the first absolute position P1, the motor starts to operate towards the second absolute position P2 and receives the 3rd absolute position reference P3 at the same time, after which, planning of the third displacement profile starts.
- t1: Position loop control cycle, which is defined by the servo drive
- t2: Interpolation cycle, which can be defined through the object dictionary 60C2h. The SV680P series servo drive supports a synchronization cycle of 1 ms to 20 ms. Synchronization cycles beyond this range will be restricted by this range.
- P0/P1/P2 - absolute position. An absolute position reference is sent through 60C1-60C1.1h. The interpolation mode supports absolute position references only.
- The displacement reference increments in each synchronization cycle are P1-P0 and P2-P1.
- When using the interpolation mode, set the position loop period to 1 k.
- The displacement reference increments in each synchronization cycle are P1-P0 and P2-P1.

2.5.1 Function Block Diagram



2.5.2 Configuration Block Diagram

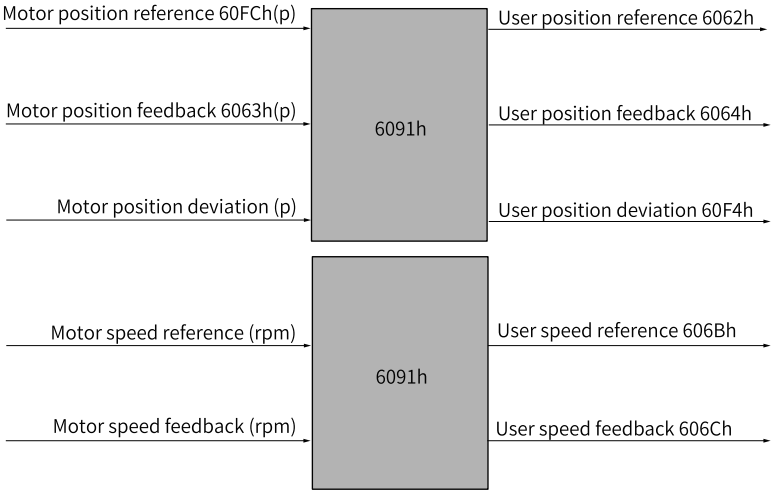


Figure 2-7 IP mode configuration

2.5.3 Recommended Configuration

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

RPDO	TPDO	Remarks
6040h: control word	6041h: status word	Mandatory
60C1.01h: Target position	6064h: position actual value	Mandatory
6060h: modes of operation	6061h: modes of operation display	Optional

2.5.4 Related Parameters

The control word 6040h in the IP mode is described as follows:

6040h **Control word**

Address:	-		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	Uint16
Default:	-	Change:	During running At once
Access:	RW	Mapping:	RPDO

Value Range:

0 to 65535

Description:
Defines the control command.

bit	Name	Setpoint	Description
0 to 3	-	See the relationship between status switching and control commands	See the object dictionary.
4	Interpolation mode enable	-	0: Interpolation interrupted 1: Interpolation enabled bit4 must always be 1 during interpolation. bit12 of 6041h can be used as a feedback indicating whether the interpolation mode is activated.
5 to 6	N/A	-	-
7 to 15	-	See the relationship between status switching and control commands	See the object dictionary.

6041h **Status word**

Address:	-		
Min.:	-	Unit:	-
Max.:	-	Data Type:	Uint16
Default:	-	Change:	-
Access:	RO	Mapping:	TPDO

Value Range:
-

Description:
Indicates the servo drive status.

bit	Name	Setpoint	Description
0 to 9	-	See the relationship between status switching and control commands	See the object dictionary.
10	The target position is reached.	-	0: The target position is not reached. 1: The target position is reached.
11	Software internal setting overlimit	-	0: The position actual value does not reach the software internal position limit. 1: The actual position value reaches the software position limit.
12	Interpolation mode activated	-	0: Interpolation is not activated. 1: Interpolation is activated.
13	Position deviation	-	0: Acceptable position deviation 1: Excessive position deviation
14	N/A	-	-
15	Homing completed	-	0: Homing is not performed or done. 1: Homing is complete.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6060h	6060h	Modes of operation	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Immediately	"6060h" on page 433
6061h	6061h	Operation mode display	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Unchangeable	"6061h" on page 434
6064h	6064h	Position actual value	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"6064h" on page 435
6066h	6066h	Following error time out	0 ms to 65535 ms	0	ms	Immediately	"6066h" on page 436
607Fh	607Fh	Max. profile velocity	0 to 4294967295	838860800	Reference unit/s	Immediately	"607Fh" on page 442

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60C1.01h	60C1-01h	Interpolation displacement	-2147483648 to 2147483647	0	Reference unit	Immediately	"60C1_en.01h" on page 451
60C2.01h	60C2-01h	Interpolation time period	1 to 20	1	-	Immediately	"60C2_en.01h" on page 451
6081h	6081h	Profile velocity	0 to 4294967295	13981013	Reference unit/s	Immediately	"6081h" on page 443
6083h	6083h	Profile acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"6083h" on page 443
6084h	6084h	Profile deceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"6084h" on page 443

2.5.5 Related Functions

Positioning completed

Positioning completed: When position deviation fulfills the set condition, the positioning process is done. In this case, the servo drive sets bit10 of the status word 6041h, and the host controller, once receives the signal, acknowledges that positioning has been completed.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6067h	6067h	Position window	0 to 4294967295	5872	Reference unit	Immediately	"6067h" on page 436
6068h	6068h	Position window time	0 ms to 65535 ms	0	ms	Immediately	"6068h" on page 436

Detection on excessive position deviation

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6065h	6065h	Following error window	0 to 4294967295	27486951	Reference unit	Immediately	"6065h" on page 435

Reference polarity

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

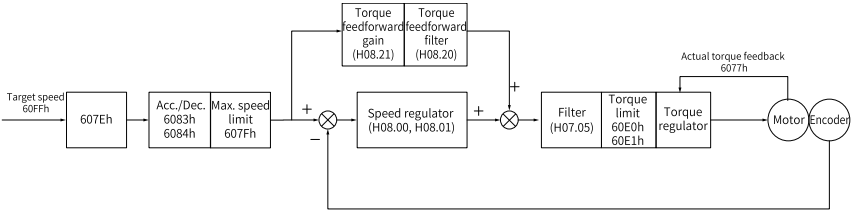
☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Eh	607Eh	Reference polarity	0 to 127	0	-	Immediately	"607Eh" on page 442

2.6 Profile Velocity (PV) Mode

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

2.6.1 Function Block Diagram



2.6.2 Configuration Block Diagram

Profile velocity mode (6060h=3)

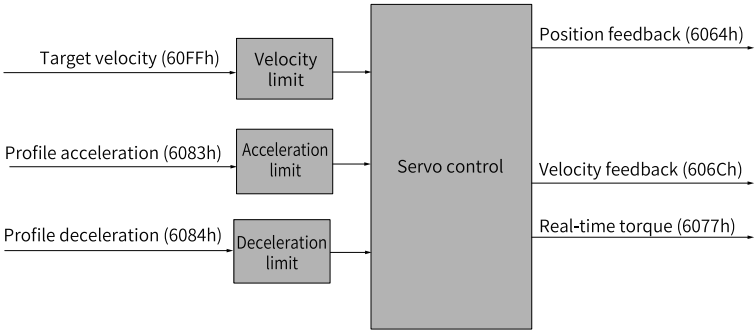


Figure 2-8 PV mode

2.6.3 Recommended Configuration

The basic configuration for 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

2.6.4 Related Parameters

6040h **Control word**

Address: -
Min.: 0
Max.: 65535
Default: -
Access: RW
Unit: -
Data Type: Uint16
Change: During running
At once
Mapping: RPDO

Value Range:

0 to 65535

Description:

Defines the control command.

bit	Name	Description
0	Switch on	1: Active, 0: Inactive
1	Connect the main circuit power	1: Active, 0: Inactive
2	Quick stop	0: Active, 1: Inactive
3	Operation enabled	1: Active, 0: Inactive
8	Halt	0: Keep present operating state, 1: Halt

6041h Status word

Address: -

Min.: -

Max.: -

Default: -

Access: RO

Unit: -

Data Type: Uint16

Change: -

Mapping: TPDO

Value Range:

-

Description:

Indicates the servo drive status.

bit	Name	Description
0	Ready to switch on	1: Active, 0: Inactive
1	Switch on	1: Active, 0: Inactive
2	Operation enabled	1: Active, 0: Inactive
3	Fault	1: Active, 0: Inactive
4	Voltage enabled	1: Active, 0: Inactive
5	Quick stop	0: Active, 1: Inactive
6	Switch on disabled	1: Active, 0: Inactive
7	Warning	1: Active, 0: Inactive
8	Manufacturer-specific	Undefined
9	Remote	1: Active, control word activated 0: Inactive
10	Target reach	0: The target velocity is not reached. 1: The target velocity is reached.
11	Internal limit active	0: Position feedback within the limit 1: Position feedback beyond the limit
12	Speed	0: Speed is not 0 1: Speed is 0
13	-	N/A

bit	Name	Description
14	Manufacturer-specific	Undefined
15	Home Find	0: Homing not done 1: Homing done

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6083h	6083h	Profile acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"6083h" on page 443
6084h	6084h	Profile deceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"6084h" on page 443
60FFh	60FFh	PV target velocity	–2147483648 to +2147483647	0	Reference unit/s	Immediately	"60FFh" on page 456

2.6.5 Related Functions

Monitoring on speed reach status

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
606Dh	606Dh	Velocity window	0rpm–65535rpm	10	rpm	Immediately	"606Dh" on page 437
606Eh	606Eh	Velocity window time	0 ms to 65535 ms	0	ms	Immediately	"606Eh" on page 437

Monitoring on zero speed

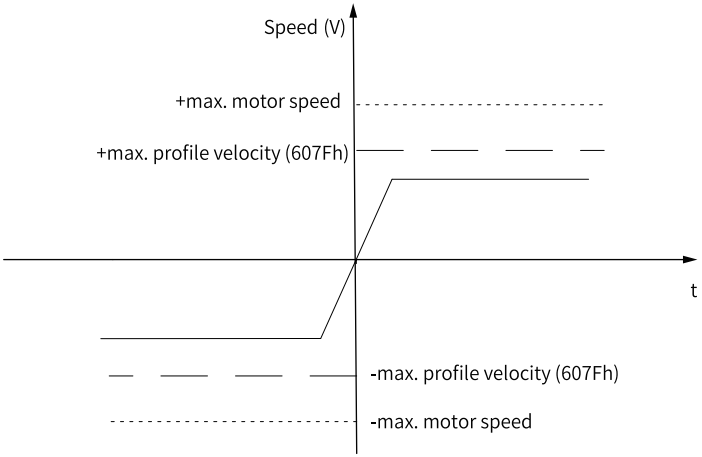
It is used to check whether the absolute value of motor speed feedback is lower than the set threshold. If yes, the motor is considered to be close to standstill (zero speed). Bit12 of 6041h is set to 1.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
606Fh	606Fh	Velocity threshold	0rpm–65535rpm	10	rpm	Immediately	*"606Fh" on page 438*
6070h	6070h	Velocity threshold time	0 ms to 65535 ms	0	ms	Immediately	*"6070h" on page 438*

Speed limit

In PV 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:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Fh	607Fh	Max. profile velocity	0 to 4294967295	838860800	Reference unit/s	Immediately	*"607Fh" on page 442*

Acceleration and deceleration limits

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60C5h	60C5h	Max. acceleration	0 to 4294967295	4294967295	Reference unit/s^2	Immediately	"60C5h" on page 452
60C6h	60C6h	Max. deceleration	0 to 4294967295	4294967295	Reference unit/s^2	Immediately	"60C6h" on page 452

Reference polarity

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

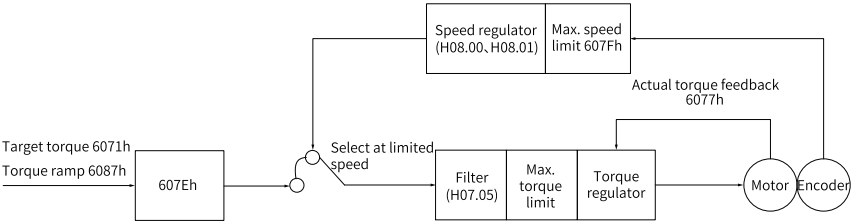
☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Eh	607Eh	Reference polarity	0 to 127	0	-	Immediately	"607Eh" on page 442

2.7 Profile torque (PT) mode

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

2.7.1 Function Block Diagram



2.7.2 Configuration Block Diagram

Profile torque mode (6060h=4)

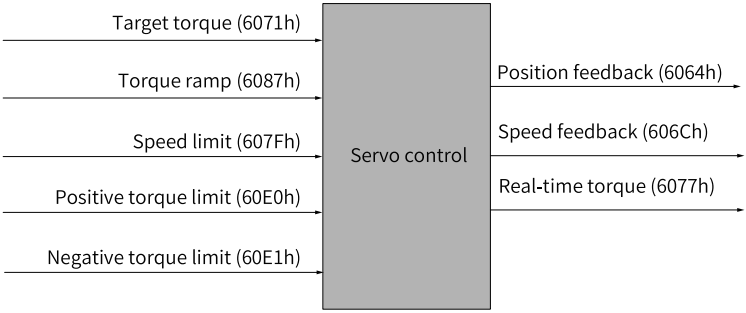


Figure 2-9 PT mode

2.7.3 Recommended Configuration

The basic configuration for the PT 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

2.7.4 Related Parameters

6040h **Control word**

Address: -

Min.:	0	Unit:	-
Max.:	65535	Data Type:	Uint16
Default:	-	Change:	During running At once
Access:	RW	Mapping:	RPDO

Value Range:

0 to 65535

Description:

Defines the control command.

bit	Name	Description
0	Switch on	1: Active, 0: Inactive
1	Connect the main circuit power	1: Active, 0: Inactive
2	Quick stop	0: Active, 1: Inactive
3	Operation enabled	1: Active, 0: Inactive
8	Halt	0: Keep present operating state, 1: Halt

6041h Status word

Address: -

Min.: - Unit: -

Max.: - Data Type: Uint16

Default: - Change: -

Access: RO Mapping: TPDO

Value Range:

-

Description:

Indicates the servo drive status.

bit	Name	Description
0	Ready to switch on	1: Active, 0: Inactive
1	Switch on	1: Active, 0: Inactive
2	Operation enabled	1: Active, 0: Inactive
3	Fault	1: Active, 0: Inactive
4	Voltage enabled	1: Active, 0: Inactive
5	Quick stop	0: Active, 1: Inactive
6	Switch on disabled	1: Active, 0: Inactive
7	Warning	1: Active, 0: Inactive
8	Manufacturer-specific	Undefined
9	Remote	1: Active, control word activated 0: Inactive
10	Target reach	0: Target torque not reached 1: Target torque reached
11	Internal limit active	0: Position feedback within the limit 1: Position feedback beyond the limit
12 to 14	No assignment	No assignment, always being 0
15	Home Find	0: Homing not done 1: Homing done

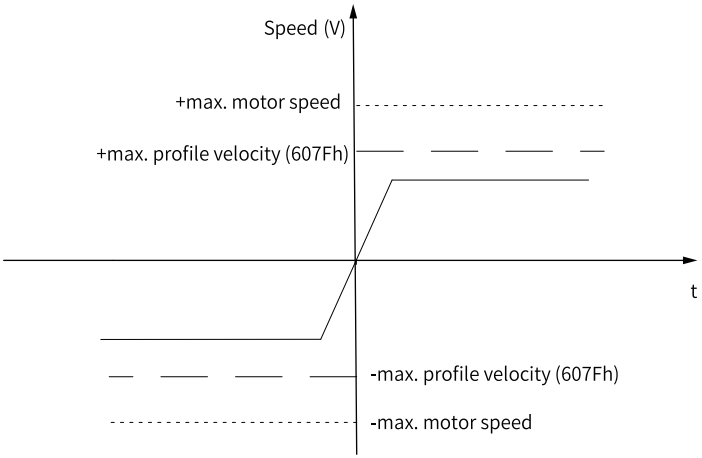
☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6071h	6071h	Target torque	-4000. to 4000.	0	0.001	Immediately	"6071h" on page 439
6074h	6074h	Torque reference	-4000. to 4000.	0	0.001	Unchangeable	"6074h" on page 440
6077h	6077h	Torque actual value	-4000. to 4000.	0	0.001	Unchangeable	"6077h" on page 440
6087h	6087h	Torque slope	0.%/s–4294967295.%/s	4294967295	0.1%/s	Immediately	"6087h" on page 444

2.7.5 Related Functions

Speed limit in the torque control mode

In the torque control mode, 607Fh can be used to limit the maximum speed in forward/reverse running. Note that the maximum speed cannot exceed the maximum running speed allowed by the motor.

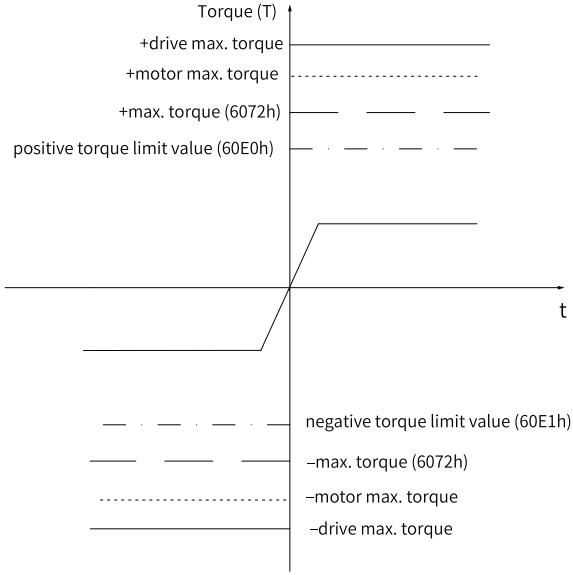


☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Fh	607Fh	Max. profile velocity	0 to 4294967295	838860800	Reference unit/s	Immediately	"607Fh" on page 442

Torque limit

To protect the mechanical devices, you can limit the torque references of the servo drive in the position, speed, and torque control modes by setting 6072h (Max 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:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6072h	6072h	Max. torque	0. to 4000.	3500	0.001	Immediately	"6072h" on page 439
60E0h	60E0h	Positive torque limit value	0. to 4000.	3500	0.001	Immediately	"60E0h" on page 454
60E1h	60E1h	Negative torque limit value	0. to 4000.	3500	0.001	Immediately	"60E1h" on page 454

Torque reference polarity

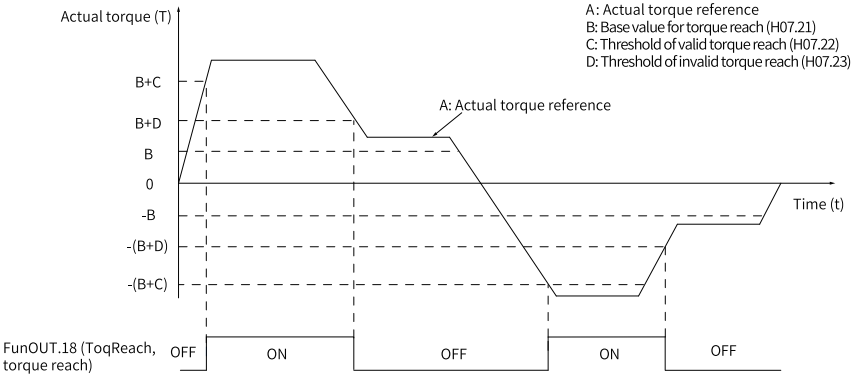
You can change the torque reference direction through setting the torque reference polarity.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Eh	607Eh	Reference polarity	0 to 127	0	-	Immediately	*" 607Eh" on page 442*

Monitoring on torque reach

It 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.



- Actual torque reference (viewed in H0b.02): A
- Base value for torque reach (H07.21): B.
- Threshold of valid torque arrival (H07.22): C.
- Threshold of invalid torque reach (H07.23): D.

C and D are the offset based on B.

The torque reach DO signal can be activated only when the actual torque reference meets the following condition: $|A| \geqslant B + C$. Otherwise, the torque reach DO signal remains inactive.

The torque reach signal is deactivated only when the actual torque reference meets the following condition: $|A| < B + D$. Otherwise, the torque reach signal remains active.

2.8 Homing Mode (HM)

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

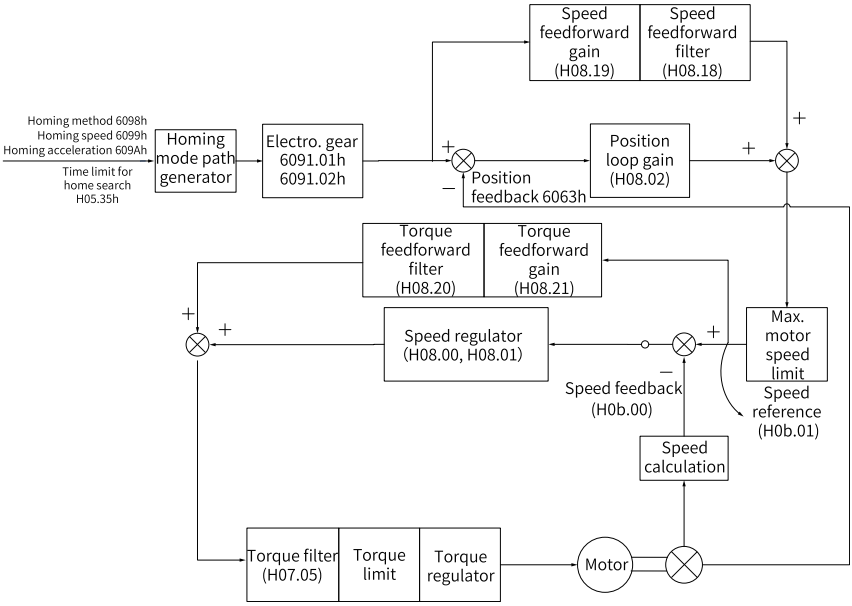
- Mechanical home: a fixed position on the machine, which corresponds to a certain home switch or the motor Z signal.
- Mechanical zero: absolute zero position on the machine

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

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

When 607Ch = 0, the mechanical home coincide with the mechanical zero.

2.8.1 Function Block Diagram



2.8.2 Configuration Block Diagram

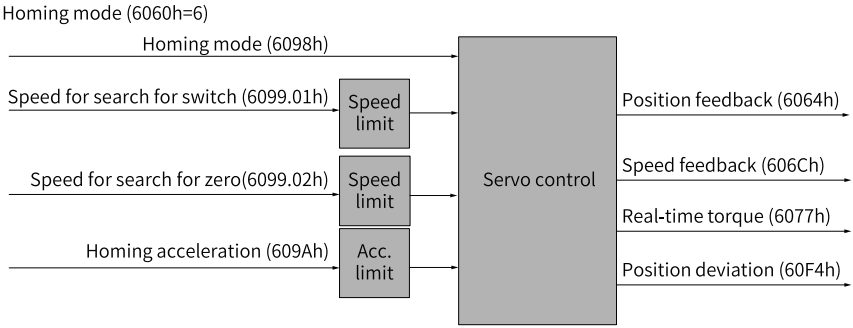


Figure 2-10 HM mode

2.8.3 Recommended 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

2.8.4 Related Parameters

6040h **Control word**

Address:	-		
Min.:	0	Unit:	-
Max.:	65535	Data Type:	Uint16
Default:	-	Change:	During running At once
Access:	RW	Mapping:	RPDO

Value Range:

0 to 65535

Description:

Defines the control command.

bit	Name	Description
0	Switch on	1: Active, 0: Inactive
1	Connect the main circuit power	1: Active, 0: Inactive
2	Quick stop	0: Active, 1: Inactive
3	Operation enabled	1: Active, 0: Inactive
8	Halt	0: Keep present operating state, 1: Halt

6041h Status word

Address: -

Min.: - Unit: -

Max.: - Data Type: Uint16

Default: - Change: -

Access: RO Mapping: TPDO

Value Range:

-

Description:

Indicates the servo drive status.

bit	Name	Description
0	Ready to switch on	1: Active, 0: Inactive
1	Switch on	1: Active, 0: Inactive
2	Operation enabled	1: Active, 0: Inactive
3	Fault	1: Active, 0: Inactive
4	Voltage enabled	1: Active, 0: Inactive
5	Quick stop	0: Active, 1: Inactive
6	Switch on disabled	1: Active, 0: Inactive
7	Warning	1: Active, 0: Inactive
8	Manufacturer-specific	Undefined
9	Remote	1: Active, control word activated 0: Inactive
10	Target reach	1: Origin is found or homing is interrupted or failed 0: Disabled or origin is not found
11	Internal limit active	0: Position reference within the limit 1: Position reference beyond the limit
12	Homing attained	0: Homing not attained 1: Homing attained

bit	Name	Description
13	Homing error	0: No error 1: Error is present
15	Home Find	0: Homing not done 1: Homing done

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6098h	6098h	Homing method	-3 to 35	1	-	Immediately	*"6098h" on page 445*
6099.01h	6099-01h	Speed during search for switch	0 to 4294967295	13981013	Reference unit/s	At stop	*"6099_en.01h" on page 447*
6099.02h	6099-02h	Speed during search for zero	0 to 4294967295	1398101	Reference unit/s	At stop	*"6099_en.02h" on page 447*
609Ah	609Ah	Homing acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	*"609Ah" on page 447*

2.8.5 Related Functions

Homing timeout

When the homing duration exceeds the value defined by H05.35 (Time of home searching), the servo drive reports E601.0 (Homing timeout).

E601.0 can be used to determine whether the homing speed, the acceleration setpoint, and connections of the switch signal and homing signal are proper.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H05.35	2005-24h	Home search time limit	0 to 65535	10000	-	Immediately	*"H05_en.35" on page 151*

Actual position calculation method

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Ch	607Ch	Home offset	-2147483648 to 2147483647	0	Reference unit	Immediately	*" 607Ch" on page 441*

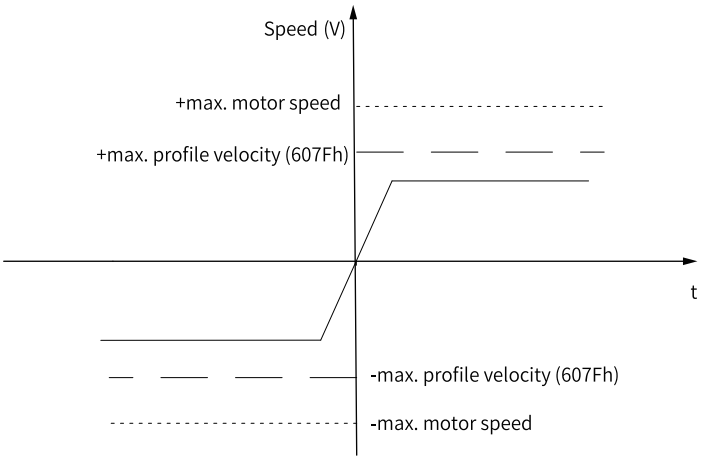
Position deviation monitoring function

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6065h	6065h	Following error window	0 to 4294967295	27486951	Reference unit	Immediately	*" 6065h" on page 435*
6066h	6066h	Following error time out	0 ms to 65535 ms	0	ms	Immediately	*" 6066h" on page 436*

Speed limit

In the HM mode, 607Fh can be used to limit the maximum speed in forward/reverse operation. Note that the maximum speed cannot exceed the maximum running speed allowed by the motor.



☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Fh	607Fh	Max. profile velocity	0 to 4294967295	838860800	Reference unit/s	Immediately	*" 607Fh" on page 442*

Acceleration limit

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

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60C5h	60C5h	Max. acceleration	0 to 4294967295	4294967295	Reference unit/s^2	Immediately	*" 60C5h" on page 452*

2.8.6 Homing Operation

6098h = 1

Mechanical home: Z signal

Deceleration point: negative limit switch (N-OT)

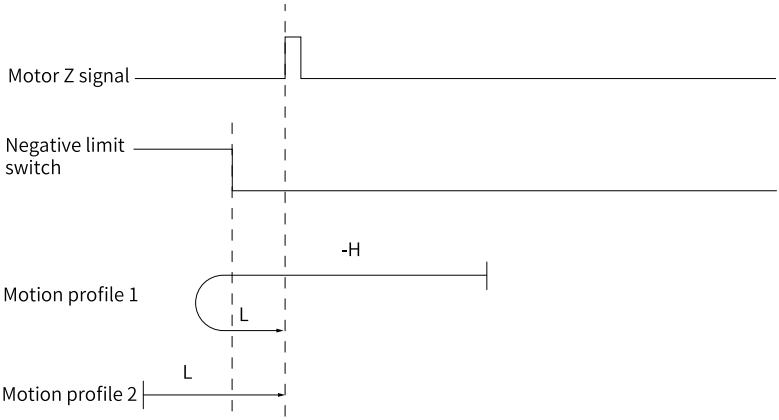


Figure 2-11 Motor running curve and speeds in Mode 1

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

Note

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 (P-OT)

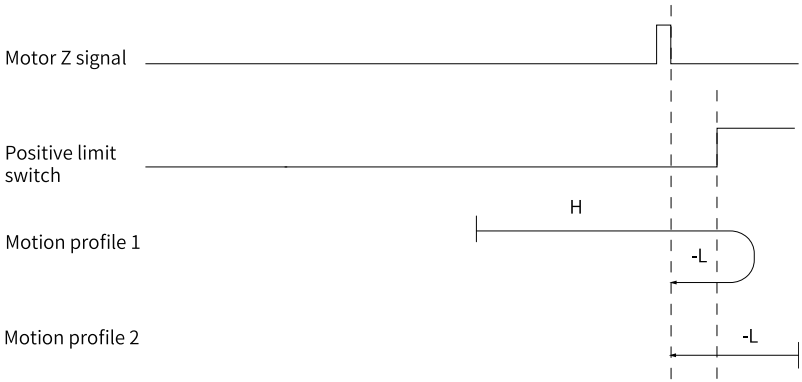


Figure 2-12 Motor running curve and speeds in Mode 2

- Motion profile 1: Deceleration point signal inactive at start.

- Motion profile 2: Deceleration point signal active at start.

6098h = 3

Home: Z signal

Deceleration point: home switch (HW)

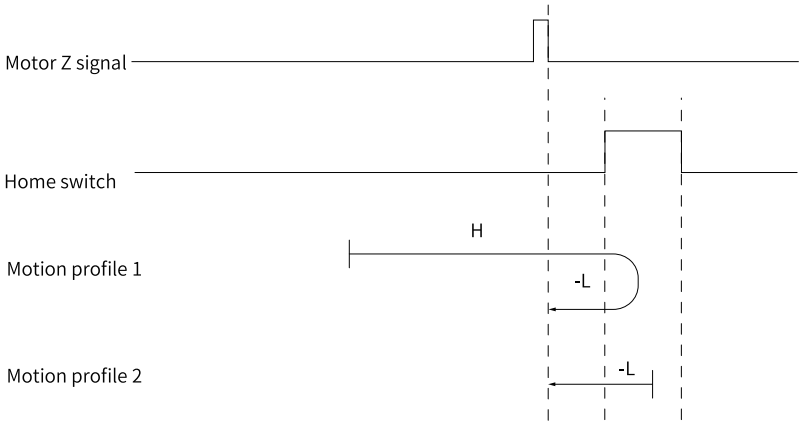


Figure 2-13 Motor running curve and speeds in Mode 3

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 4

Home: Z signal

Deceleration point: home switch (HW)

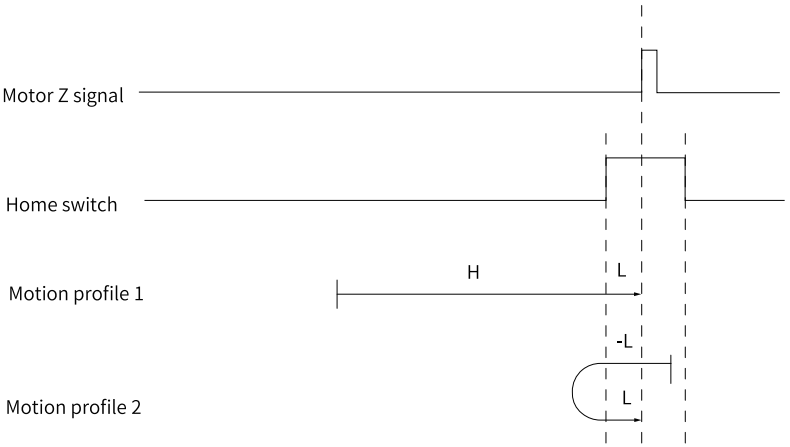


Figure 2-14 Motor running curve and speeds in Mode 4

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 5

Home: Z signal

Deceleration point: home switch (HW)

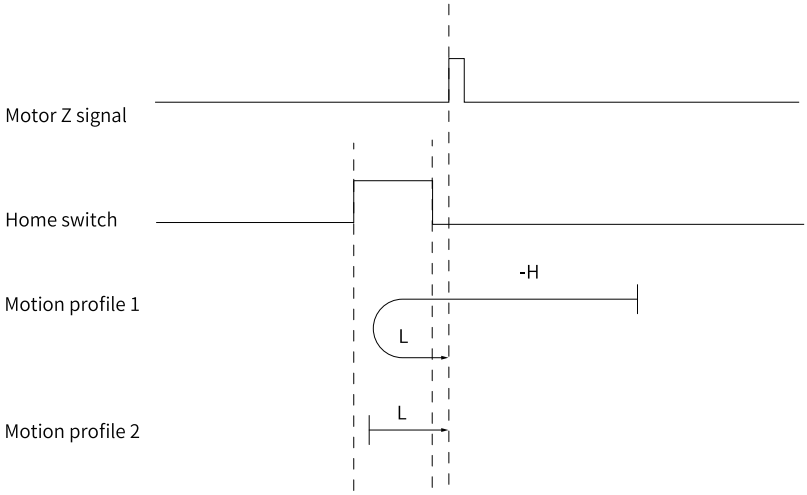


Figure 2-15 Motor running curve and speeds in Mode 5

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 6

Home: Z signal

Deceleration point: home switch (HW)

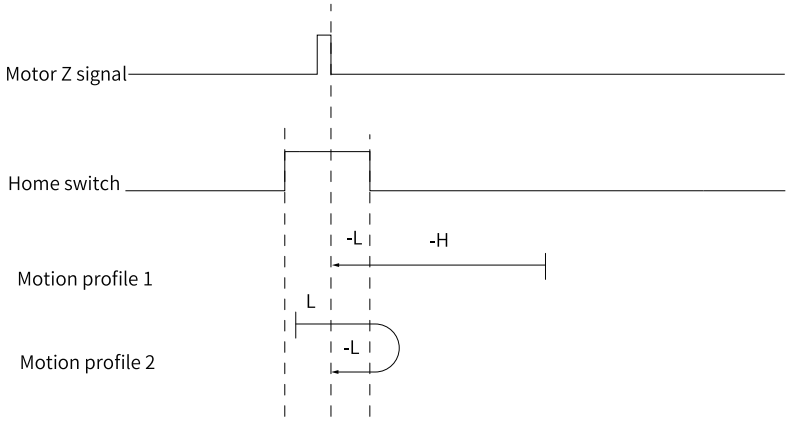


Figure 2-16 Motor running curve and speeds in Mode 6

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 7

Home: Z signal

Deceleration point: home switch (HW)

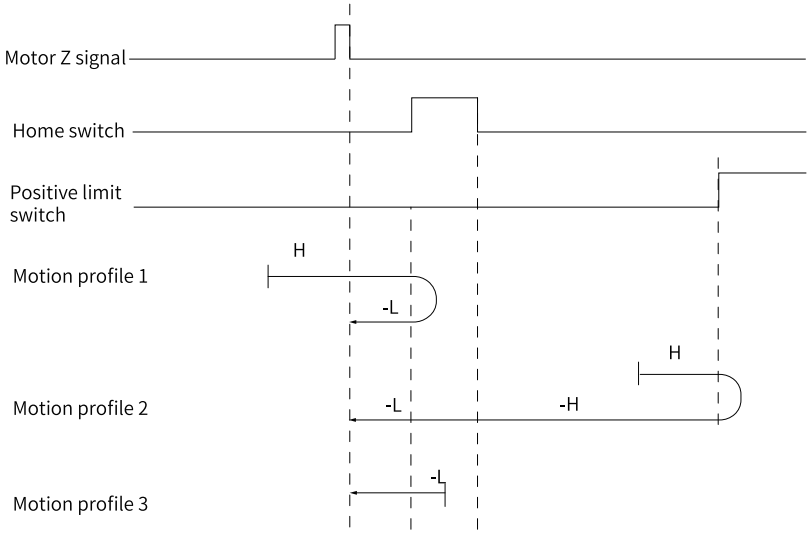


Figure 2-17 Motor running curve and speeds in Mode 7

- Motion profile 1: Deceleration point signal inactive at start, not hitting the positive limit switch.
- Motion profile 2: HW signal inactive at start, hitting the positive limit switch.

- Motion profile 3: Deceleration point signal active at start.

6098h = 8

Home: Z signal

Deceleration point: home switch (HW)

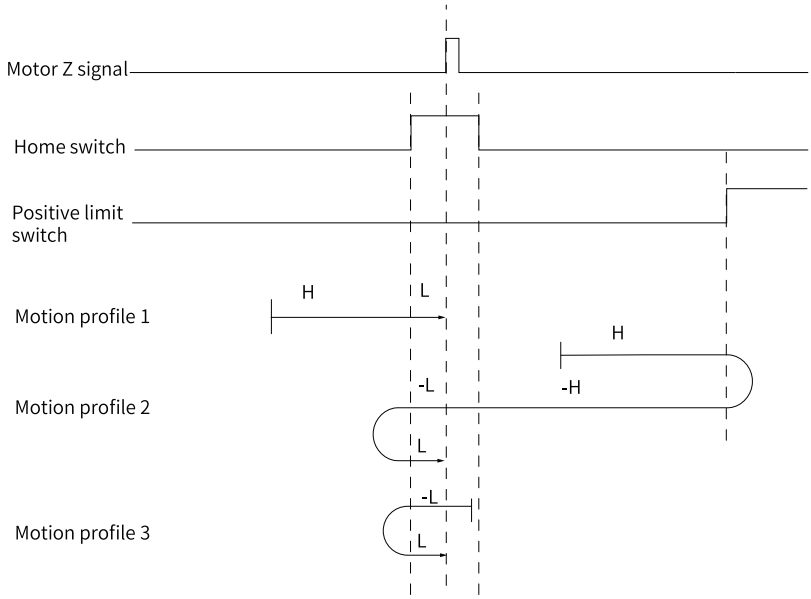


Figure 2-18 Motor running curve and speeds in Mode 8

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

6098h = 9

Home: Z signal

Deceleration point: home switch (HW)

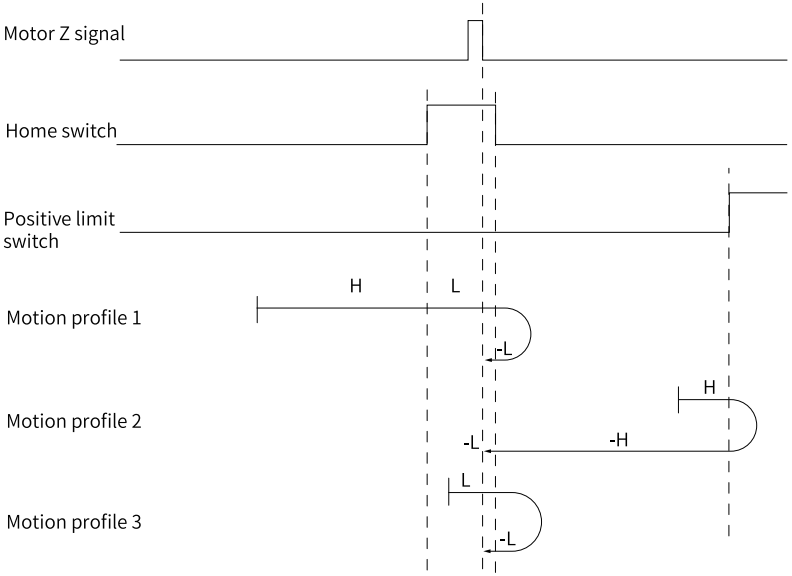


Figure 2-19 Motor running curve and speeds in Mode 9

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

6098h = 10

Home: Z signal

Deceleration point: home switch (HW)

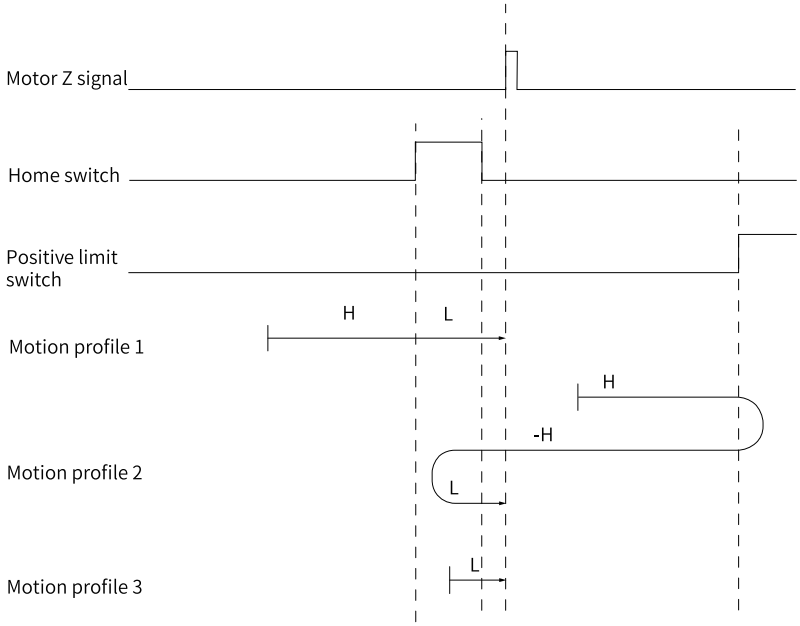


Figure 2-20 Motor running curve and speeds in Mode 10

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

6098h = 11

Home: Z signal

Deceleration point: home switch (HW)

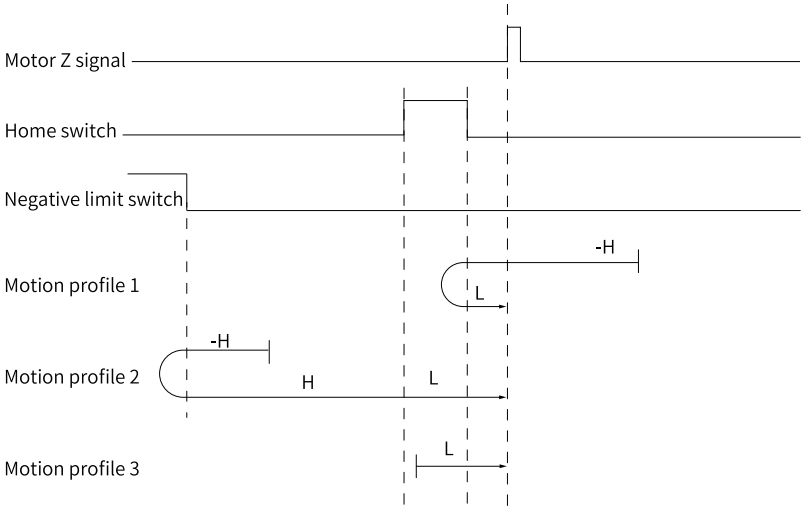


Figure 2-21 Motor running curve and speeds in Mode 11

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

6098h = 12

Home: Z signal

Deceleration point: home switch (HW)

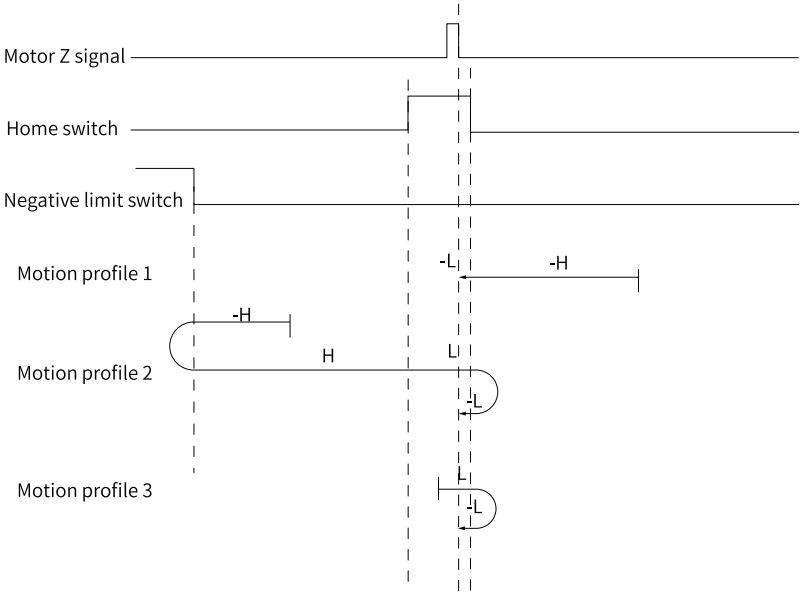


Figure 2-22 Motor running curve and speeds in Mode 12

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

6098h = 13

Home: Z signal

Deceleration point: home switch (HW)

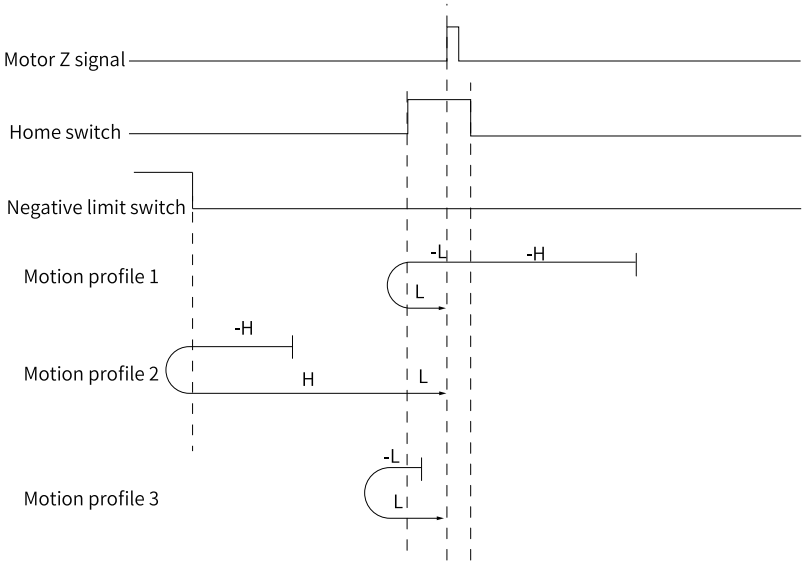


Figure 2-23 Motor running curve and speeds in Mode 13

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

6098h = 14

Home: Z signal

Deceleration point: home switch (HW)

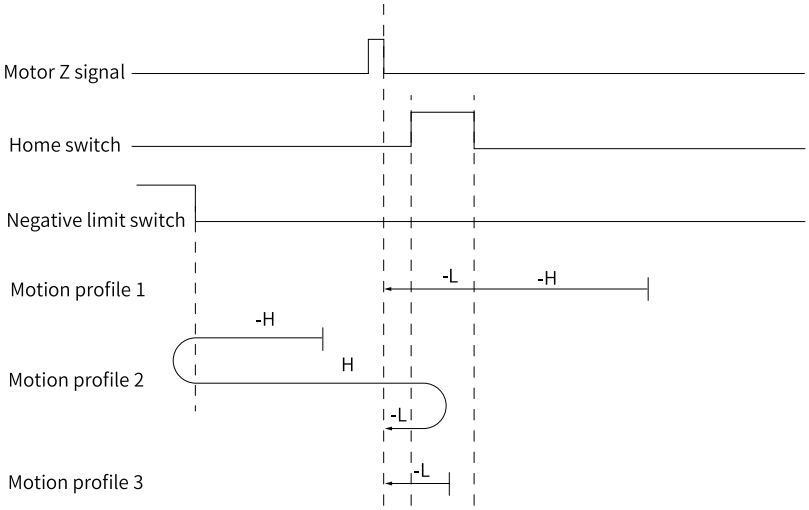


Figure 2-24 Motor running curve and speeds in Mode 14

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

6098h = 17

Home: negative limit switch

Deceleration point: negative limit switch (N-OT)

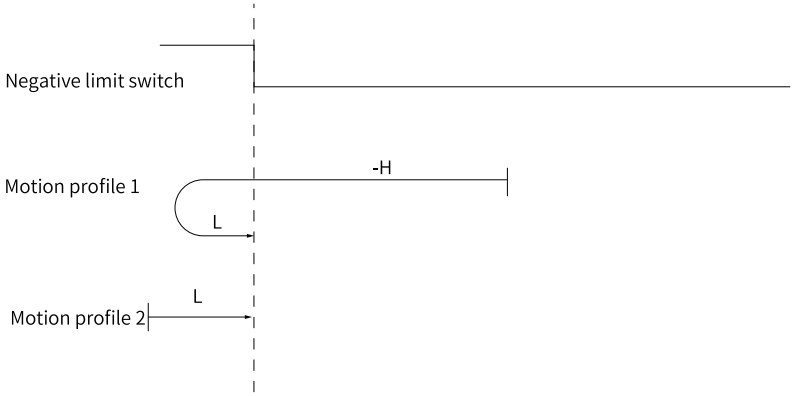


Figure 2-25 Motor running curve and speeds in Mode 17

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 18

Home: positive limit switch

Deceleration point: positive limit switch (P-OT)

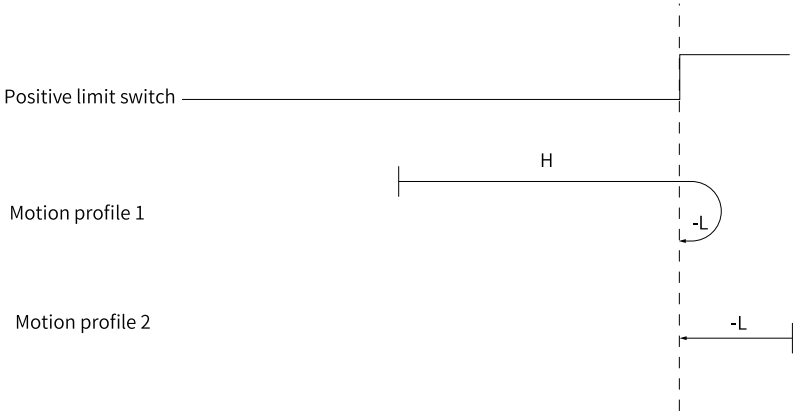


Figure 2-26 Motor running curve and speeds in Mode 18

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 19

Home: home switch (HW)

Deceleration point: home switch (HW)

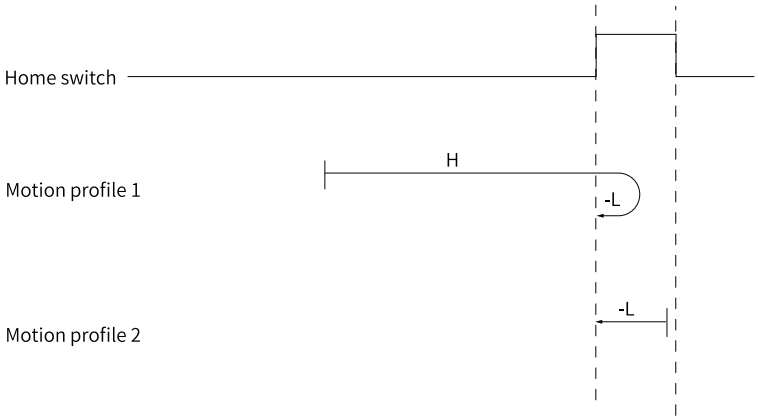


Figure 2-27 Motor running curve and speeds in Mode 19

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 20

Home: home switch (HW)

Deceleration point: home switch (HW)

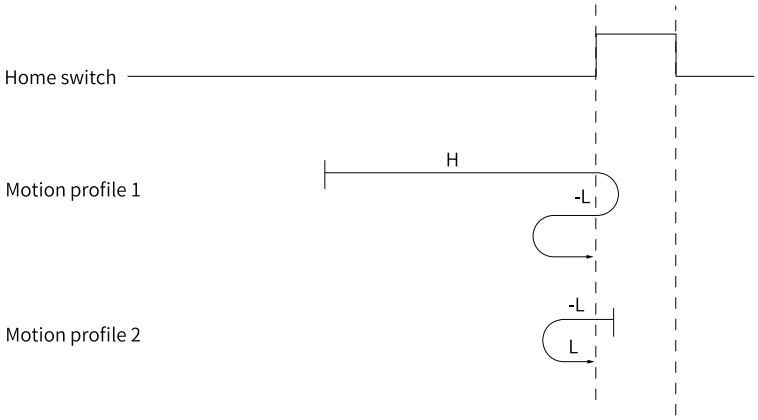


Figure 2-28 Motor running curve and speeds in Mode 20

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 21

Home: home switch (HW)

Deceleration point: home switch (HW)

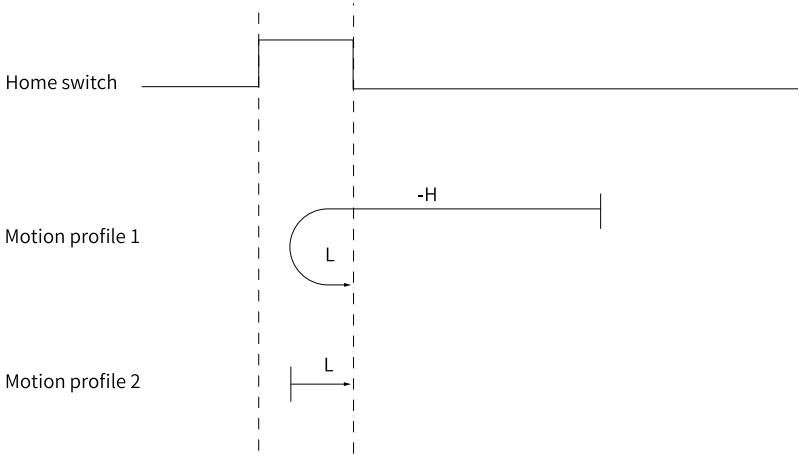


Figure 2-29 Motor running curve and speeds in Mode 21

- Motion profile 1: Deceleration point signal inactive at start.

- Motion profile 2: Deceleration point signal active at start.

6098h = 22

Home: home switch (HW)

Deceleration point: home switch (HW)

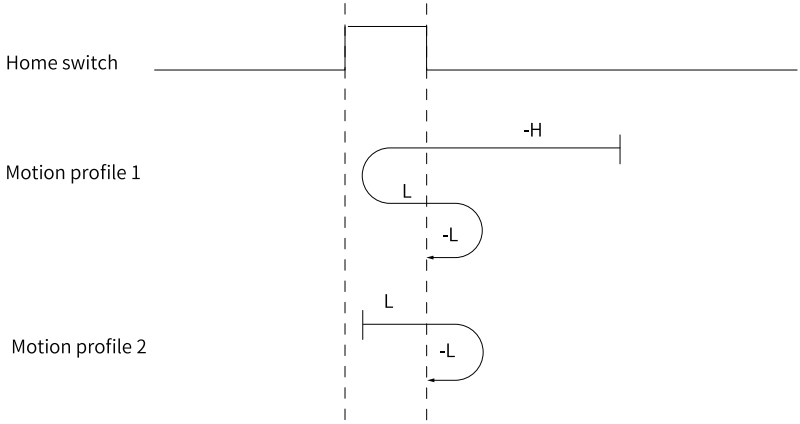


Figure 2-30 Motor running curve and speeds in Mode 20

- Motion profile 1: Deceleration point signal inactive at start.
- Motion profile 2: Deceleration point signal active at start.

6098h = 23

Home: home switch (HW)

Deceleration point: home switch (HW)

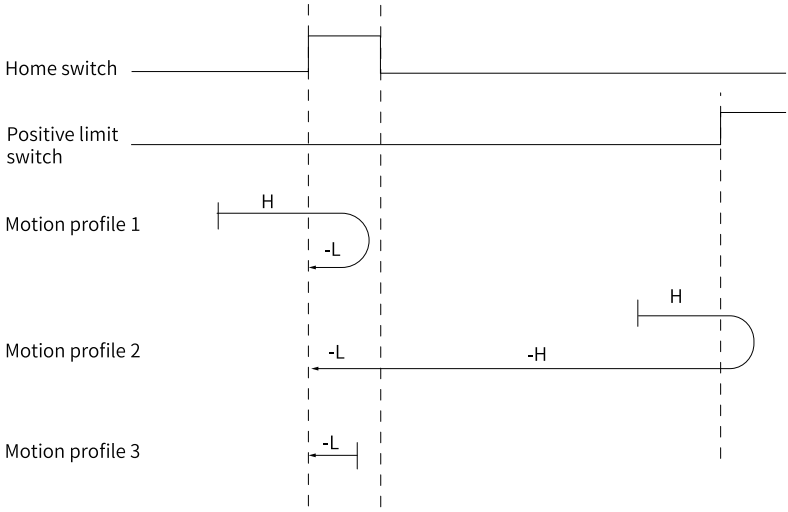


Figure 2-31 Motor running curve and speeds in Mode 23

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

6098h = 24

Home: home switch (HW)

Deceleration point: home switch (HW)

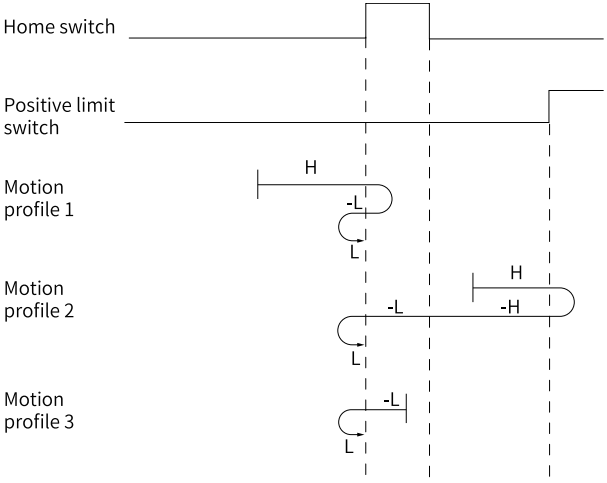


Figure 2-32 Motor running curve and speeds in Mode 24

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

6098h = 25

Home: home switch (HW)

Deceleration point: home switch (HW)

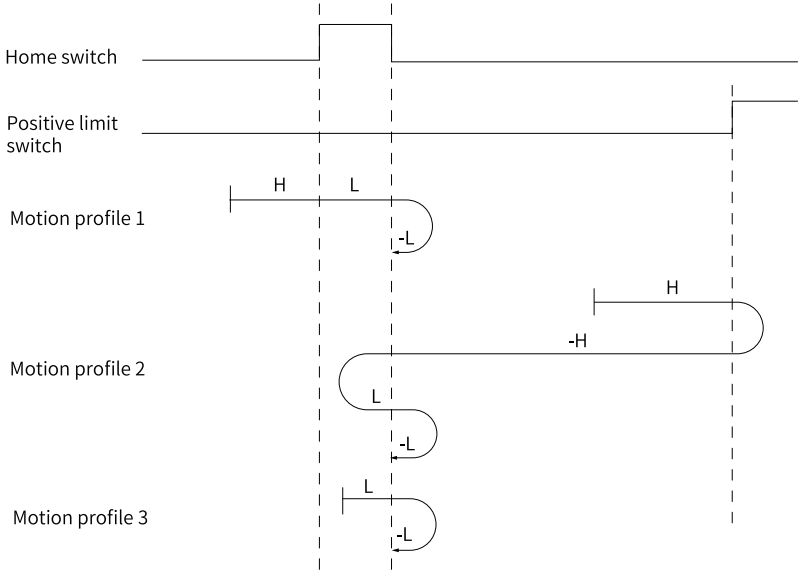


Figure 2-33 Motor running curve and speeds in Mode 25

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

6098h = 26

Home: home switch (HW)

Deceleration point: home switch (HW)

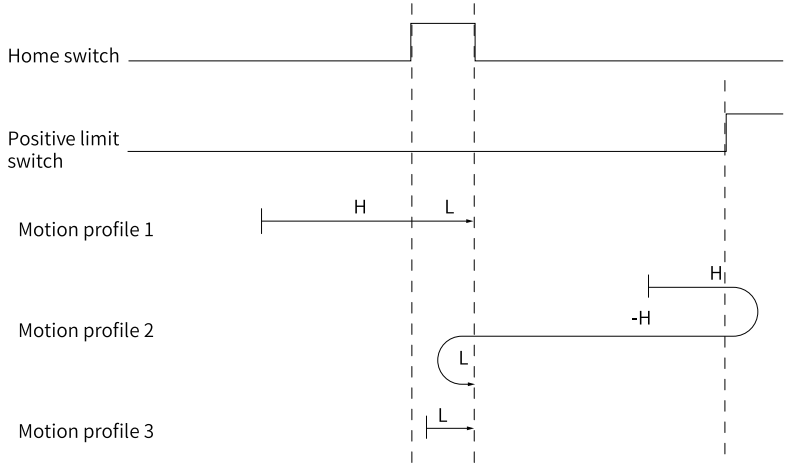


Figure 2-34 Motor running curve and speeds in Mode 26

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

6098h = 27

Home: home switch (HW)

Deceleration point: home switch (HW)

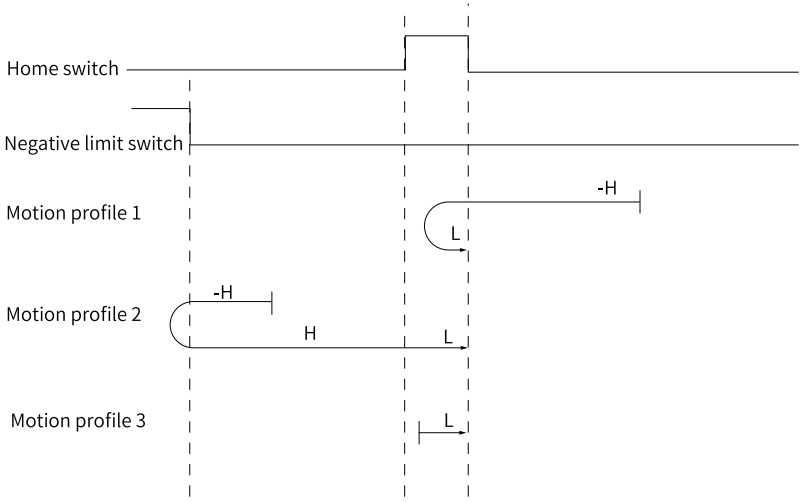


Figure 2-35 Motor running curve and speeds in Mode 27

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

6098h = 28

Home: home switch (HW)

Deceleration point: home switch (HW)

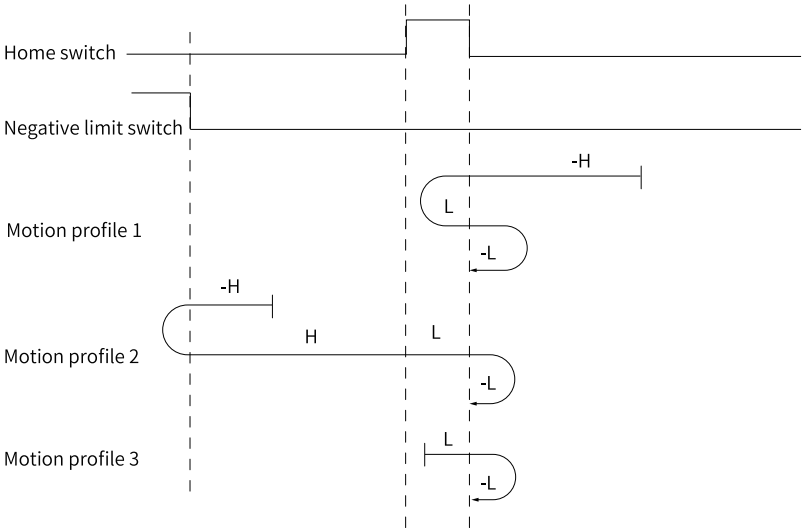


Figure 2-36 Motor running curve and speeds in Mode 28

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

6098h = 29

Home: home switch (HW)

Deceleration point: home switch (HW)

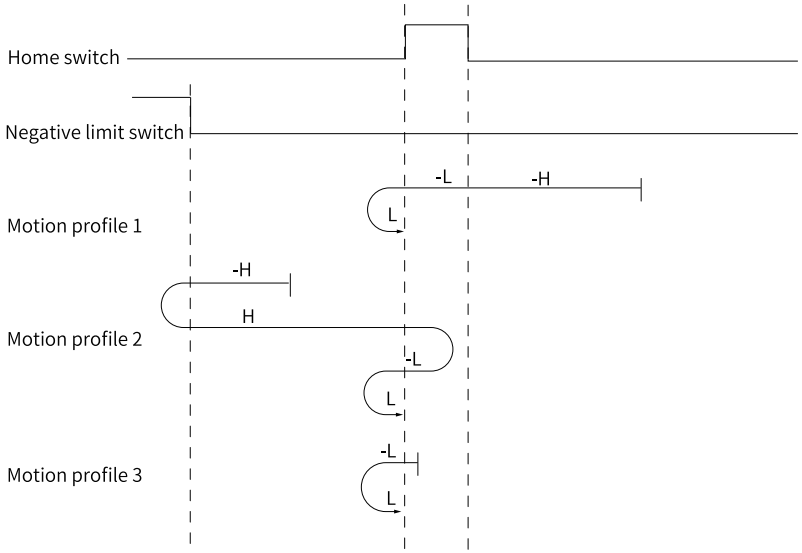


Figure 2-37 Motor running curve and speeds in Mode 29

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

6098h = 30

Home: home switch (HW)

Deceleration point: home switch (HW)

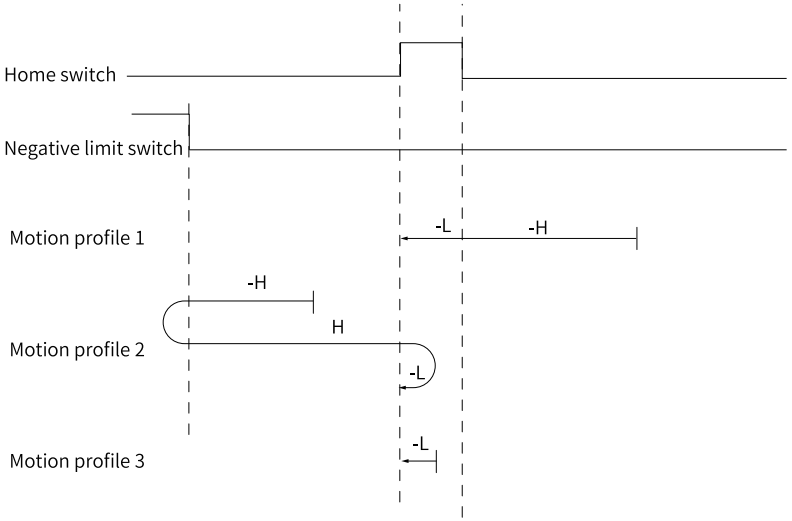


Figure 2-38 Motor running curve and speeds in Mode 30

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

6098h = 31/32

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

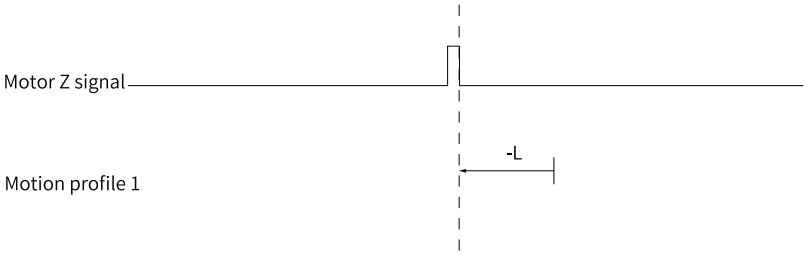


Figure 2-39 Motor running curve and speeds in Mode 33

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

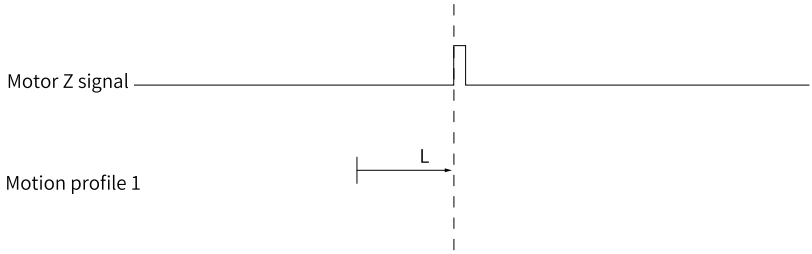


Figure 2-40 Motor running curve and speeds in Mode 34

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

6098h = 35

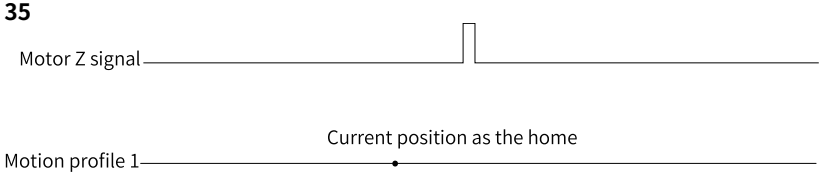


Figure 2-41 Motor running curve and speeds in Mode 35

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):

6064h (Position actual value) is equal to 607Ch (Home offset) after homing is done.

60E6h = 1 (Relative homing):

6064h is the sum of the original value plus 607Ch (Home offset) after homing is done.

6098h = -1

The motor runs in the reverse direction at 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 the axis has reached the mechanical limit position. In this case, the motor runs in the forward direction at low speed and stops after reaching the rising edge of the Z signal for the first time.

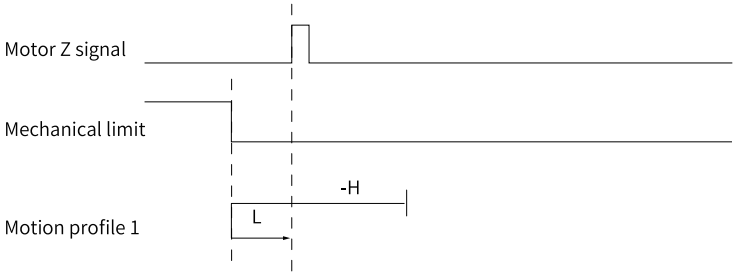


Figure 2-42 Motor running curve and speeds in Mode -1

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 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.

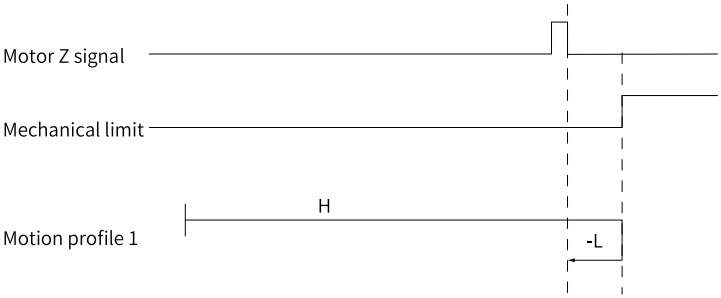


Figure 2-43 Motor running curve and speeds in Mode -2

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.

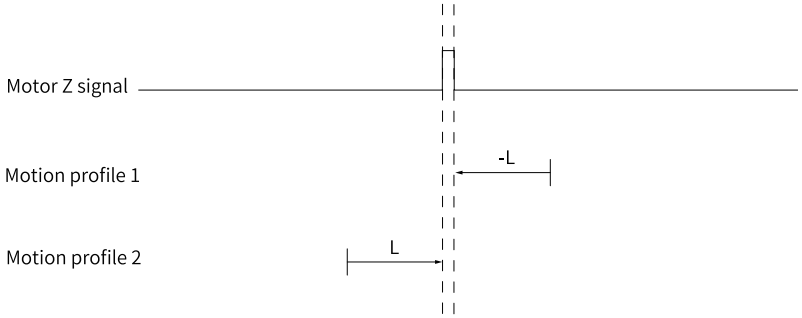


Figure 2-44 Motor running curve and speeds in Mode -3

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

2.9 Auxiliary Functions

2.9.1 Communication-forced DO

Description

When CANopen switches to the operational (OP) status, the forced DO is determined by 60FE.01h and 60FE-02h. In the non-operational (non-OP) status (including CAN network), the following two DO options are available by default:

- Status unchanged: The servo status switches to the non-OP status and the forced DO status stays unchanged.
- No output: No forced DO is generated when the servo drive is in the non-OP status.

Related objects

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H04.23	2004-18h	Communication-forced DO logic in non-OP status	bit0: DO1 0: Status unchanged 1: No output bit1: DO2 0: Status unchanged 1: No output bit2: DO3 0: Status unchanged 1: No output bit3: DO4 0: Status unchanged 1: No output bit4: DO5 0: Status unchanged 1: No output	0	-	Immediately	*" H04_en.23" on page 137*

Setting method:

1. Assign DO function 31 to the DO to be controlled forcibly by CiA402 protocol, 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/02h as RPDO, and operate on bit16–bit20 to control the DO.

2.9.2 Servo OFF

Quick stop

Quick stop applies when bit2 (Quick stop) in the control word 6040h is set to 0 (Valid). The quick stop mode is defined by 605Ah.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
605Ah	605Ah	Quick stop option code	0: Coast to stop, keeping de-energized state 1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state 2: Ramp to stop as defined by 6085h, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state 6: Ramp to stop as defined by 6085h, keeping position lock state 7: Stop at emergency stop torque, keeping position lock state	2	-	At stop	*"605Ah" on page 431*

Halt

When the control word 6040h bit8 = 1 in servo drive running state, a halt command is input and the servo drive performs the halt operation in the mode set in 605Dh.

☆ Related parameters:

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
605Dh	605Dh	Stop option code	1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state 2: Ramp to stop as defined by 6085h, keeping position lock state 3: Stop at emergency stop torque, keeping position lock state	1	-	At stop	*"605Dh" on page 432*



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

2.9.3 Touch Probe

The touch probe function is available in servo drives that support CANopen communication.

Description

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

The drive offers two 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 2–3 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	bit1	Touch probe rising edge compensation: 1: Enabled, 0: Disabled
	bit2	Touch probe falling edge compensation: 1: Enabled, 0: Disabled
H0A.53		DI probe DI on compensation time (DI switch off→on)
H0A.54		DI probe DI off compensation time (DI switch on→off)

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

There are three Z touch probe triggers: 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.
	H05.41.bit2 = 1, frequency-division output Z signal	The Z touch probe is triggered by the frequency-division output Z signal, including the multi-turn Z signal.
Fully closed-loop feedback	H0F.25 = 0, motor Z signal	When there is no Z signal input in the pulse-type fully closed-loop mode, you can trigger the touch probe through the motor Z signal to latch external position feedback.
	H0F.25 = 1, fully closed-loop Z signal	When there is Z signal input in the pulse-type fully closed-loop mode, you can trigger the touch probe latch function through the fully closed-loop Z signal.

Related objects

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60B8h	60B8h	Touch probe function	0 to 65535	0	-	Immediately	*"60B8h" on page 448*
60B9h	60B9h	Touch probe status	0 to 65535	0	-	Unchangeable	*"60B9h" on page 449*
60BAh	60BAh	Touch probe 1 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*"60BAh" on page 450*
60BBh	60BBh	Touch probe 1 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*"60BBh" on page 450*
60BCh	60BCh	Touch probe 2 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*"60BCh" on page 451*
60BDh	60BDh	Touch probe 2 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*"60BDh" on page 451*
60D5h	60D5h	Touch probe 1 positive edge counter	0 to 65535	0	-	Unchangeable	*"60D5h" on page 453*
60D6h	60D6h	Touch probe 1 negative edge counter	0 to 65535	0	-	Unchangeable	*"60D6h" on page 453*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60D7h	60D7h	Touch probe 2 positive edge counter	0 to 65535	0	-	Unchangeable	"60D7h" on page 453
60D8h	60D8h	Touch probe 2 negative edge counter	0 to 65535	0	-	Unchangeable	"60D8h" on page 454

Operation procedure

Example:

Use DI7 to trigger the touch probe. Background: touch probe 1 positive edge, continuous latching

Observe the following steps:

1. Set the function of DI7 (H03.14 = 38). Set the DI7 logic to NO (H03.15 = 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.

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60B8h	60B8h	Touch probe function	0 to 65535	0	-	Immediately	"60B8h" on page 448

   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.

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60B9h	60B9h	Touch probe status	0 to 65535	0	-	Unchangeable	"60B9h" on page 449

   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 position latch at 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.

The following figure shows touch probe function settings and status feedback sequence when DI7 is used as the trigger signal in case of latching at positive edge and continuous triggering.

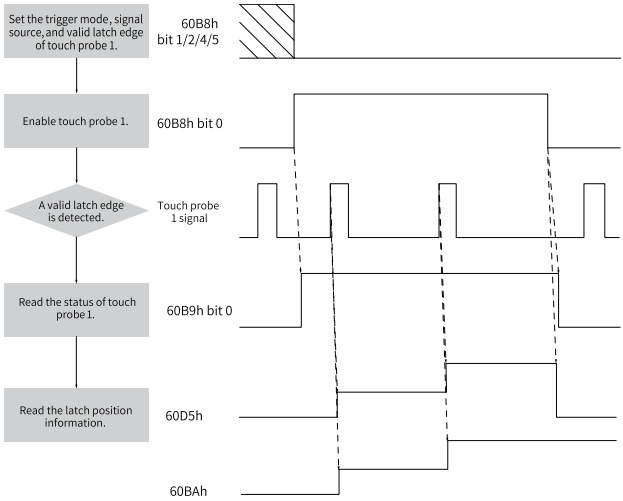


Figure 2-45 Procedure for use of the touch probe

3 STO

3.1 General

3.1.1 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_D	Probability of a dangerous Failure per Hour
PL	Performance Level
SC	Systematic capability
SIL	Safety integrity level
T_1	Test interval
DI	Digital input
DO	Digital output
PCB	Printed circuit board
MCU	Micro computer unit
FPGA	Field programmable gate array
MTTFd	Mean time to dangerous failure
STO	The safe torque off (STO) function brings the machine safely into a no-torque state and prevents it from unexpected start. If the motor is running when STO function is activated, it coasts to 0 RPM.

3.1.2 Safety Standards

Standards compliance

- EC directives and standards
  Low Voltage Directive 2014/35/EU Standard 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 standard

Safety standard	Reference
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/A1:2017

- Safety data

Item	Safety data
SIL	SIL3, IEC61508 Maximum SIL3, EN IEC62061
PFH_D	$PFH_D \leqslant 1.1\times10^{-9}$[1/h] (1.1% of SIL3)
Cat.	3, EN ISO 13849-1
PL	e, EN ISO 13849-1
MTTFd	904 years (high)
DCavg	⩾90% (medium)
T_1	20 years
HFT	1
SC	SC3
λ_S	2.5×10^{-7}/h
λ_{DD}	1.3×10^{-7}/h
λ_{DU}	2.0×10^{-9}/h
MTTR	0 hour
MRT	0 hour
Application mode	High demand or continuous mode
Device type	Type B

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

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

λ_{DU} means 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.

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.

Item	Description
Ambient/Storage temperature	0°C to 55°C/-20°C to +70°C
Ambient/Storage humidity	20%–95% RH (no condensation)
Vibration	<table><tr><th>Item</th><th>Test Condition</th></tr><tr><td>Test reference</td><td>See IEC 60068-2-6 4.6</td></tr><tr><td>Condition</td><td>EUT powered on, operating 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 amplitude</td></tr><tr><td>57 Hz < f ⩽ 150 Hz</td><td>1 kg</td></tr><tr><td>Duration of vibration</td><td>10 sweep cycles per axis on each of three mutually perpendicular axes</td></tr><tr><td>Axes</td><td>X, Y, Z</td></tr><tr><td>Detail of mounting</td><td>According to manufacturer's specification</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>See IEC 60068-2-27: 2008 Table 17</td></tr>
<tr><td>Condition</td><td>EUT powered on, operating 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) 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>Axes</td><td>±X, ±Y, ±Z</td></tr>
<tr><td>Detail of mounting</td><td>According to manufacturer's specification</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>2000 m or below</td></tr>
<tr><td>Cooling method</td><td>Dry clean air (natural convection)</td></tr>
<tr><td>Others</td><td>Free of static electricity, strong electromagnetic fields, magnetic fields, or exposure to 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	SV670*S1R6I-FS SV670*S2R8I-FS SV670*S5R5I-FS SV670*S7R6I-FS SV670*S012I-FS SV670*T3R5I-FS SV670*T5R4I-FS SV670*T8R4I-FS SV670*T012I-FS SV670*T017I-FS SV670*T021I-FS SV670*T026I-FS
Position	Integrated on the control board of the drive
Safety function - Inputs	Two channels: STO1/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.

3.1.3 Precautions for Use

General Safety Instructions

The chapter contains the warning symbols used in this manual and the safety instructions which you must obey when you install or connect an option module to a drive or 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 3–1 Warnings, Cautions and Notes

Pictogram	Signal word	Meaning	Consequences in case of disregard
Example:  DANGER  Hazardous voltage e.g. electric shock	DANGER	DANGER	Indicates that failure to comply with the notice will result in death or severe personal injuries
	WARNINGS	Warning	Indicates that failure to comply with the notice may result in death or severe personal injuries
	CAUTION	Note	Indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage
	STOP	Prohibit	Indicates that failure to comply with the notice will result in equipment or environmental damage



- 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 essential health and safety function requirements specified in the Machinery Directive are met. Risk analysis and risk assessment is needed before using a product. Make sure that adequate measures are taken to eliminate/reduce the relating risks and components chosen must meet the safety requirements.

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

Safety function: Use the safety function after properly understanding all of these information. Incorrect use of safety functions or use of safety functions that are not sufficient to meet the safety requirements of the site may result in personal injury.

Safety Precautions

Carefully read the following important precautions and observe them when using the safety function.

- STO function is not intended as a replacement for the emergency stop function (E-stop). If only the STO function is triggered, with no extra measures taken, the power supply cannot be cut off in emergencies and high-current parts of the motor and drive are still energized, incurring the risk of electric shock or other risks result in electric energy. Therefore maintenance work on electrical parts of the drive or motor can only be carried out after isolating the drive system from the main supply.
- Depending on the standards and requirements for a particular application, it may be possible to use STO as an integral part of an E-stop system. However, its main purpose is for use in a dedicated safety control arrangement whose purpose is to prevent any hazard from occurring, without the use of an E-stop.
- An E-stop is often provided in a machine to allow for unexpected situations where an operator sees a hazard and can take action to prevent an accident.
- The design requirement for an E-stop differs from that of a safety interlock. Generally, the E-stop is required 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 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 can be present even when the safety functions operate. Therefore, safety must always be given consideration during risk assessment.
- If external forces (such as gravitational force with 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).
- p: Number of motor pole pairs.

To ensure safety, users should decide all the risk assessments and residual risks in the entire machine equipment. A company and individual who constructed the safety related system must take full responsibility for installation and commissioning of the system. 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 shows residual risks concerning the safety function of this product.

Common residual risks

- At the shipment to end-users, check the settings of safety related components with 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 them using a check sheet, etc.
- The safety will not be ensured such as in assembling machine until installing, wiring, and adjustment are completed properly. Install, wire, and adjust your system referring to installation guide for each unit.
- Only qualified personnel are authorized to install, start-up, repair or adjust the machines in which these components are installed. Only trained engineers should install and operate the equipment.
- Separate the wiring for safety observation function from other signal wiring.
- Protect the cables with appropriate ways (routing them in a cabinet, using a cable guard, etc.).
- We recommend using a switch, relay, sensor, etc. which comply with safety standards. When using a switch, relay, sensor, etc. which do not comply with safety standards, perform a safety confirmation.
- Keep the required clearance/creepage distance depending on voltage you use.
- The time to 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/inverter. Before servicing the servo/inverter, cut off the power supply and ensure that the servo/inverter are not energized.

3.2 Safe Torque Off (STO)

3.2.1 Overview

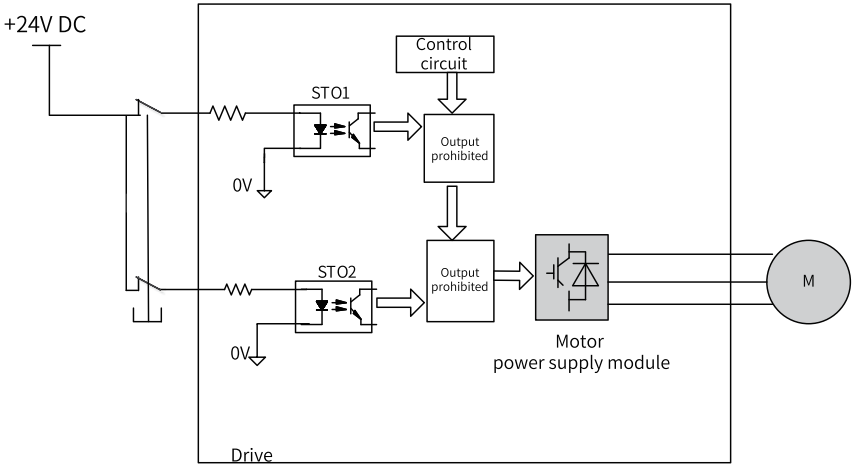


Figure 3-1 Schematics of the STO function

Safe Torque Off (STO) is a safety function that complies with IEC 61800-5-2:2016. It is built into Inovance SV670 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 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.

See the following table for the STO function.

STO1 input	STO2 input	PWM signal
H	H	Normal
L	H	Prohibit
H	L	Prohibit
L	L	Prohibit

STO (safe torque)	
Description	Cuts off the power of the motor.
Description	The safe torque off (STO) function brings the machine safely into a no-torque state and prevents it from unexpected start. If the motor is running when STO function is activated, it coasts to stop.
Safe state	Disables the PWM gating signal of the drive.
Operating mode	High demand mode or continuous mode

3.2.2 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.
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.

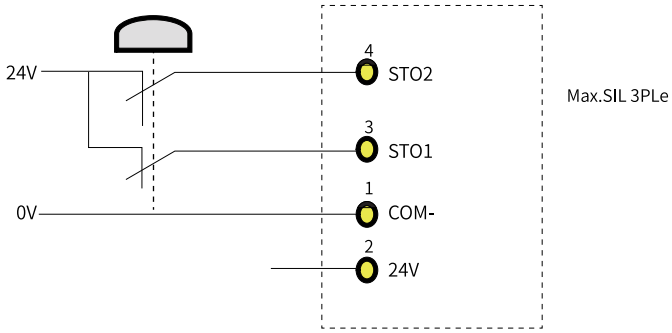
Note

- 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).

Application Example of Safety Function

Example 1:

Emergency button（dual-contact）Class 3 ISO13849



3.2.3 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.

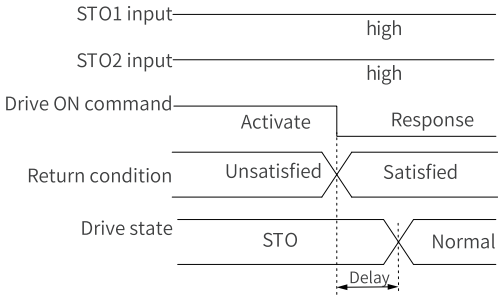


Figure 3-2 Return condition of servo ON/RUN command

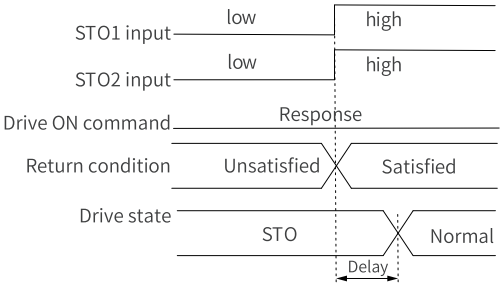


Figure 3-3 Return condition of external STO request state

- When STO_IN (STO1 or STO2 input) is restored to 24 V, the EDM and servo ready signals are immediately reset to 0. After 400 milliseconds, the servo operation signal is activated (when STO_IN keeps at 24 V). Servo operation is PWM drive signal output.

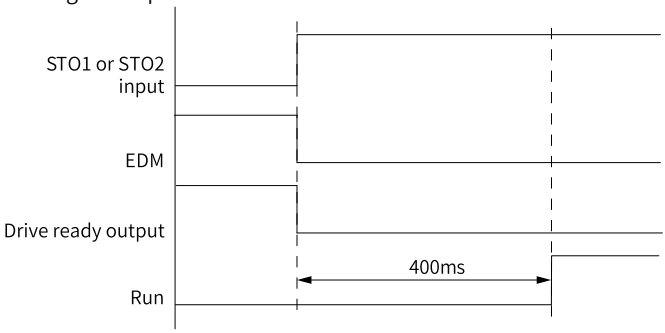
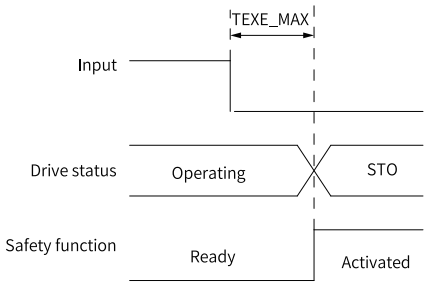


Figure 3-4 Servo drive reset timing diagram

3.2.4 Safety Function Response Time

The STO function prevents movement of the motor by 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.

If either one or both signals are set to "Low" level, the PWM signals will be blocked within 30 ms.



3.3 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 the safety function (wiring, components, settings and so on).
  - 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, references to failure reports and resolution of failures. Any new acceptance tests performed due to changes or maintenance need to be logged into the logbook.

- Checklist

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 based on 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 stops: 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 stops: 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 send a start command to the drive. Ensure that the motor stays at a standstill and the keypad of the drive displays "E150.1".	
5.4	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.	

Step	Action	Result
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.	
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.

3.4 Troubleshooting

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.

Error Code	Cause	Corrective Action
E150.1	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 "High" state after the 24 V signal is disconnected. Contact Inovance for technical support.
E150.2	OV/UV of the 5V power supply is detected.	Restore the 5 V power supply to normal state. Contact Inovance for technical support.
E150.3	The input circuit of STO works improperly.	Fix the input circuit fault. Contact Inovance for technical support.
E150.4	The buffer circuit of STO works improperly.	Fix the buffer circuit fault. Contact Inovance for technical support.

4 Description of Parameters

4.1 H00 Servo Motor Parameters

H00.00 **Motor code**

Hexadecimal:	2000-01h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	14101	Change:	At stop

Value Range:

0 to 65535

Description

14000: Inovance 20-bit incremental encoder motor

14101: Inovance 23-bit absolute encoder motor

14102: Inovance 26-bit absolute encoder motor

H00.02 **Customized No.**

Hexadecimal:	2000-03h	Effective Time:	-
Min.:	000000.00	Unit:	-
Max.:	FFFFFF.FF	Data Type:	UInt32
Default:	000000.00	Change:	Unchangeable

Value Range:

000000.00 to FFFFFF.FF

Description

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

H00.04 **Encoder version**

Hexadecimal:	2000-05h	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**

Hexadecimal:	2000-06h	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**

Hexadecimal:	2000-07h	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**

Hexadecimal:	2000-08h	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00–655.35

Description

Display the software version number of STO function.

H00.08 **Serial encoder type**

Hexadecimal:	2000-09h	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

4.2 H01 Servo Drive Parameters

H01.00 **MCU software version**

Hexadecimal:	2001-01h	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**

Hexadecimal:	2001-02h	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.**

Hexadecimal:	2001-03h	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.

H01.06 **Board software version**

Hexadecimal:	2001-07h	Effective Time:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0–6553.5

Description

Display board software version number, with 1 decimal place.

H01.10 **Drive series No.**

Hexadecimal:	2001-0Bh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	3	Change:	At stop

Value Range:

2: S1R6
3: S2R8
5: S5R5
6: S7R6
7: S012
8: S018
9: S022
10: S027
10001: T3R5
10002: T5R4
10003: T8R4
10004: T012
10005: T017
10006: T021
10007: T026

Description

Displays the drive series number, with no decimal place.

H01.11 **DC-AC voltage class**

Hexadecimal:	2001-0Ch	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**

Hexadecimal:	2001-0Dh	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**

Hexadecimal:	2001-0Fh	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**

Hexadecimal:	2001-11h	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**

Hexadecimal:	2001-13h	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.

H01.40 DC bus overvoltage protection threshold

Hexadecimal:	2001-29h	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.

H01.75 Current loop amplification factor

Hexadecimal:	2001-4Ch	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.

H01.89 Junction temperature parameter version

Hexadecimal:	2001-5Ah	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.

4.3 H02 Basic Control Parameters

H02.00 **Control mode**

Hexadecimal:	2002-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	8	Change:	At stop

Value Range:

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

Description

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

H02.01 **Absolute system selection**

Hexadecimal:	2002-02h	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

Hexadecimal:	2002-03h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

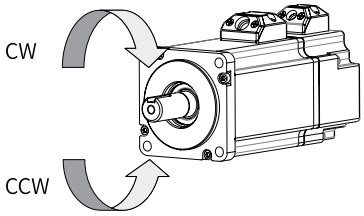
0: Counterclockwise (CCW) as forward direction

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.



H02.03 Output pulse phase

Hexadecimal:	2002-04h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

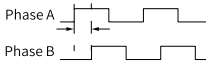
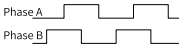
Value Range:

0: Phase A leads phase B

1: Phase A lags behind phase B

Description

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

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

H02.05 Stop mode at S-ON OFF

Hexadecimal:	2002-06h	Effective Time:	Real time
Min.:	-4	Unit:	-
Max.:	2	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

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

Description

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

H02.06 Stop mode at No.2 fault

Hexadecimal:	2002-07h	Effective Time:	Real time
Min.:	-5	Unit:	-
Max.:	4	Data Type:	Int16
Default:	2	Change:	Immediately

Value Range:

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

Description

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

H02.07 Stop mode at overtravel

Hexadecimal:	2002-08h	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 2, keeping de-energized state
4: Stop based on ramp 2, keeping position lock state
5: Dynamic braking stop, keeping de-energized state
6: Dynamic braking stop, keeping dynamic braking state
7: Not responding to overtravel

Description

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

H02.08 Stop mode at No.1 fault

Hexadecimal:	2002-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

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

Description

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

H02.09 Delay from brake output ON to command received

Hexadecimal:	2002-0Ah	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

Hexadecimal:	2002-0Bh	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

Hexadecimal:	2002-0Ch	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

Hexadecimal:	2002-0Dh	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

Hexadecimal:	2002-10h	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.

H02.17 Stop mode upon main circuit power failure

Hexadecimal:	2002-12h	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

Hexadecimal:	2002-13h	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: Stop by ramp 1, keeping de-energized state
2: Stop by ramp 2, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
5: Stop by ramp 1, keeping position lock state
6: Stop by ramp 2, keeping position lock state
7: Stop at emergency stop torque, keeping position lock state

Description

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

H02.21 Permissible minimum resistance of regenerative resistor

Hexadecimal:	2002-16h	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

Hexadecimal:	2002-17h	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**

Hexadecimal:	2002-18h	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.

Table 4–1 Specifications of the regenerative resistor

Servo Drive Model	Specifications of Built-in Regenerative Resistor		External regenerative resistor Min. Allowable Resistance (Ω) (H02.21)
	Resistance (Ω)	Power (Pr) (W)	
SV680PS1R6I	-	-	40
SV680PS2R8I	-	-	
SV680PS5R5I	50	50	
SV680PS7R6I	25	80	20
SV680PS012I			15
SV680PS018I	20	100	20
SV680PS022I			
SV680PS027I			
SV680PT3R5I	100	80	80
SV680PT5R4I			60
SV680PT8R4I	50		45
SV680PT012I			40
SV680PT017I	35	100	25
SV680PT021I			
SV680PT026I			

H02.24 **Resistor heat dissipation coefficient**

Hexadecimal:	2002-19h	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

Hexadecimal:	2002-1Ah	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

Hexadecimal:	2002-1Bh	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

Hexadecimal:	2002-1Ch	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

Hexadecimal:	2002-1Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–65535

Description

-

H02.41 Manufacturer password

Hexadecimal:	2002-2Ah	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

Hexadecimal:	2002-20h	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

Hexadecimal:	2002-21h	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

Hexadecimal:	2002-24h	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

-

H02.38 Overload time of external resistor

Hexadecimal:	2002-27h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	s
Max.:	200	Data Type:	UInt16
Default:	40	Change:	Immediately

Value Range:

0s–200s

Description

Set the overload time threshold of the external braking resistor.

H02.47 Delay time from power cable breakage to brake OFF

Hexadecimal:	2002-30h	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

Sets the delay time from power cable breakage to brake OFF.

4.4 H03 Terminal Input Parameters

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

Hexadecimal:	2003-01h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

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

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

Hexadecimal:	2003-02h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-

Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

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

H03.02 DI1 function selection

Hexadecimal:	2003-03h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	14	Change:	Immediately

Value Range:

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

11: Mode switchover M2-SEL
12: Zero clamp enable signal
13: Position reference inhibited
14: Positive limit switch
15: Reverse limit switch
16: Positive external torque limit
17: Negative external torque limit
18: Forward jog
19: Reverse jog
20: Step enable
21: Hand wheel override signal 1
22: Hand wheel override signal 2
23: Hand wheel enable signal
24: Electronic gear ratio selection
25: Torque reference direction
26: Speed reference direction
27: Position reference direction
28: Multi-position reference enable
29: Interrupt positioning canceled
31: Home switch
32: Homing enable
33: Interrupt positioning inhibited
34: Emergency stop
35: Clear position deviation
36: Internal speed limit source
37: Pulse reference inhibited
38: Touch probe 1
39: Touch probe 2

41: Current position as home
42: Axis control command executed immediately
43: Axis control command not executed immediately
44: Positioning and command completed signal clear
45: Interrupt positioning enable
46: Process segment enable
47: Process segment command switchover 1

48: Process segment command switchover 2
49: Process segment command switchover 3
50: Process segment command switchover 4
51: Event trigger process segment 1
52: Event trigger process segment 2
53: Event trigger process segment 3
54: Event trigger process segment 4
55: Process segment pause

Description

Defines the function of DI1.

H03.03 DI1 logic selection

Hexadecimal:	2003-04h	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

Hexadecimal:	2003-05h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	15	Change:	Immediately

Value Range:

See H03.02.

Description

-

H03.05 **DI2 logic**

Hexadecimal:	2003-06h	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**

Hexadecimal:	2003-07h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	13	Change:	Immediately

Value Range:
See H03.02.
Description
Defines the function of DI3.

H03.07 **DI3 logic**

Hexadecimal:	2003-08h	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**

Hexadecimal:	2003-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

See H03.02.

Description

-

H03.09 **DI4 logic**

Hexadecimal:	2003-0Ah	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**

Hexadecimal:	2003-0Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

See H03.02.

Description

-

H03.11 **DI5 logic**

Hexadecimal:	2003-0Ch	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**

Hexadecimal:	2003-0Dh	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H03.02.
Description
-

H03.13 DI6 logic

Hexadecimal:	2003-0Eh	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

Hexadecimal:	2003-0Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	45	Change:	Immediately

Value Range:
See H03.02.
Description
-

H03.15 DI7 logic

Hexadecimal:	2003-10h	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**

Hexadecimal:	2003-11h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	31	Change:	Immediately

Value Range:

See H03.02.

Description

-

H03.17 **DI8 logic selection**

Hexadecimal:	2003-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Normally open

1: Closed

Description

-

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

Hexadecimal:	2003-23h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

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

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

Hexadecimal:	2003-24h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

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

H03.50 Voltage-type AI1 offset

Hexadecimal:	2003-33h	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

Hexadecimal:	2003-34h	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

Hexadecimal:	2003-36h	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

Hexadecimal:	2003-37h	Effective Time:	Real time
Min.:	-500.0	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

Hexadecimal:	2003-3Dh	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	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**

Hexadecimal:	2003-3Eh	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	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**

Hexadecimal:	2003-3Fh	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	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**

Hexadecimal:	2003-40h	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	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**

Hexadecimal:	2003-41h	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	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 filter time

Hexadecimal:	2003-42h	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Immediately

Value Range:
0.00 ms to 500.00 ms
Description
Defines the filter time of DI6. The DI function is active only after the effective level is kept within the time defined by H03.65.

H03.66 DI7 filter time

Hexadecimal:	2003-43h	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	0.00	Change:	Immediately

Value Range:
0.00 ms to 500.00 ms
Description
Defines the filter time of DI7. The DI function is active only after the effective level is kept within the time defined by H03.66.

H03.67 DI8 filter time

Hexadecimal:	2003-44h	Effective Time:	Real time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Immediately

Value Range:
0.00 ms to 500.00 ms
Description
Defines the filter time of DI8. The DI function is active only after the effective level is kept within the time defined by H03.67.

H03.80 **Speed corresponding to analog 10 V**

Hexadecimal:	2003-51h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	At stop

Value Range:

0rpm–10000rpm

Description

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

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

H03.81 **Torque corresponding to analog 10 V**

Hexadecimal:	2003-52h	Effective Time:	Real time
Min.:	1.00	Unit:	-
Max.:	8.00	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

1.00–8.00

Description

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

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

4.5 H04 Terminal Output Parameters

H04.00 **DO1 function selection**

Hexadecimal:	2004-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: No function
1: Servo ready
2: Motor rotation signal
3: Zero speed signal
4: Speed matching signal
5: Positioning completed
6: Positioning near
7: Torque limited signal
8: Speed limited signal
9: Braking
10: Warning
11: Fault
15: Interrupt positioning completed
16: Homing completed
17: Electrical homing completed
18: Torque reached signal
19: Speed reached signal
21: Enable completed
22: Internal command completed
23: Writing next command allowed
24: Internal motion completed
25: Comparison output
26: Closed-loop state
30: Warning or fault output
31: Communication-forced DO
32: EDM output

Description

Defines the function of DO1.

H04.01 **DO1 logic selection**

Hexadecimal:	2004-02h	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.

H04.02 **DO2 function selection**

Hexadecimal:	2004-03h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	9	Change:	Immediately

Value Range:
See H04.00.
Description
-

H04.03 **DO2 logic**

Hexadecimal:	2004-04h	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**

Hexadecimal:	2004-05h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H04.00.
Description
-

H04.05 **DO3 logic**

Hexadecimal:	2004-06h	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**

Hexadecimal:	2004-07h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	11	Change:	Immediately

Value Range:
See H04.00.
Description
-

H04.07 **DO4 logic selection**

Hexadecimal:	2004-08h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Normally open
1: Closed
Description
-

H04.08 **DO5 function selection**

Hexadecimal:	2004-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	16	Change:	Immediately

Value Range:
See H04.00.
Description
-

H04.09 **DO5 logic selection**

Hexadecimal:	2004-0Ah	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

Hexadecimal:	2004-17h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

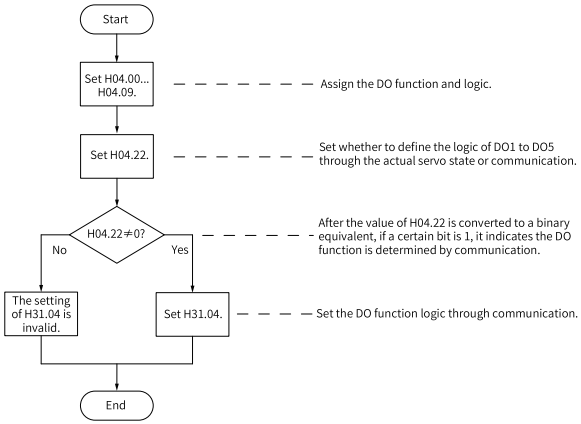
Defines whether the logic of a physical DO terminal is defined by the actual state of the drive or by communication.

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

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

Set H04.22 to a value listed in the preceding table.

H31.04 is not displayed on the keypad and can only be modified through communication. For H31.04, "bit(n) = 1" indicates the logic of DO(n+1) is active. "bit(n) = 0" indicates the logic of DO(n+1) is inactive.



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

Hexadecimal:	2004-18h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

-

H04.50 **AO1 signal selection**

Hexadecimal:	2004-33h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

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

Description

Defines the physical value source of AO1.

H04.51 **AO1 offset voltage**

Hexadecimal:	2004-34h	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**

Hexadecimal:	2004-35h	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.

4.6 H05 Position Control Parameters

H05.00 **Main position reference source**

Hexadecimal:	2005-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Pulse reference
1: Step reference
2: Multi-position reference
Description
Defines the position reference source in position control mode.

H05.02 **Pulses per revolution**

Hexadecimal:	2005-03h	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.

H05.01 Position pulse reference input terminal

Hexadecimal:	2005-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Low speed

1: High speed

Description

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

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

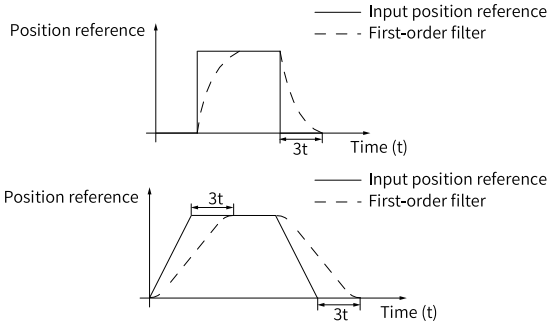
Hexadecimal:	2005-05h	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 ms to 6553.5 ms

Description

Defines the first-order low pass filter time constant of position references.
If position reference P is rectangular wave or trapezoidal wave, the position reference after first-order low pass filtering is as follows:



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

H05.05 Step reference

Hexadecimal:	2005-06h	Effective Time:	Real time
Min.:	-9999	Unit:	Reference unit
Max.:	9999	Data Type:	Int16
Default:	50	Change:	At stop

Value Range:

-9999 to +9999

Description

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

H05.06 Moving average filter time constant 1

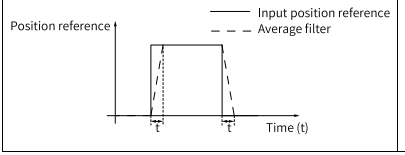
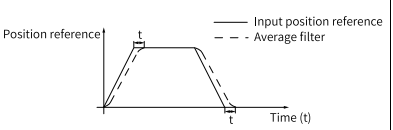
Hexadecimal:	2005-07h	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	128.0	Data Type:	UInt16
Default:	30.0	Change:	At stop

Value Range:

0.0 ms to 128.0 ms

Description

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

Position reference being rectangular wave	Position reference being trapezoidal wave
	

H05.07 Electronic gear ratio 1 (numerator)

Hexadecimal:	2005-08h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	1	Change:	Immediately

Value Range:

1 to 1073741824

Description

Defines the numerator of electronic gear ratio 1.

H05.09 Electronic gear ratio 1 (denominator)

Hexadecimal:	2005-0Ah	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	1	Change:	Immediately

Value Range:

1 to 1073741824

Description

Defines the denominator of electronic gear ratio 1.

H05.11 Electronic gear ratio 2 (numerator)

Hexadecimal:	2005-0Ch	Effective Time:	Real time

Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	1	Change:	Immediately

Value Range:

1 to 1073741824

Description

Defines the numerator of electronic gear ratio 2.

H05.13 Electronic gear ratio 2 (denominator)

Hexadecimal:	2005-0Eh	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	1	Change:	Immediately

Value Range:

1 to 1073741824

Description

Defines the denominator of electronic gear ratio 2.

H05.15 Pulse reference form

Hexadecimal:	2005-10h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Direction + Pulse, positive logic

1: Direction + Pulse, negative logic

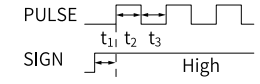
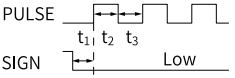
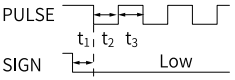
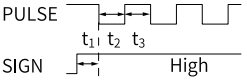
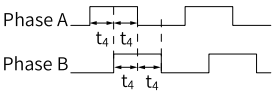
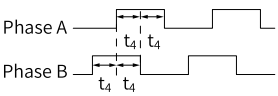
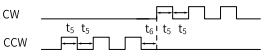
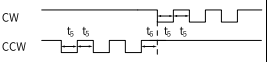
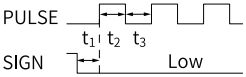
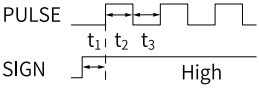
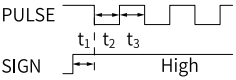
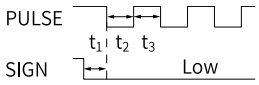
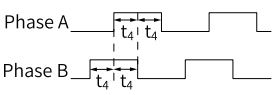
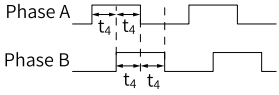
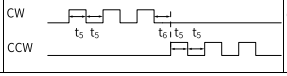
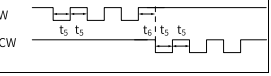
2: Phase A + phase B quadrature pulse, quadrupled frequency

3: CW + CCW

Description

Defines the input pulse form when the pulse reference acts as the main position reference source. See details in *"Table 4–2 " on page 144*.

Table 4–2 Descriptions of the pulse form

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

Note

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

Table 4–3 Specifications of pulse references

Input Terminal	Pulse Form	Single-channel max. input frequency (pps)	Min. Time Width (us)	
High-speed pulse input terminal	Direction + Pulse (positive or negative logic)	4 M	t1	0.125
			t2	0.125
			t3	0.125
	Quadrature pulse of phases A and B	2M	t4	0.125
	CW + CCW	4 M	t5	0.125
			t6	0.125
Low-speed pulse input terminal		200 k	t1	2.5
			t2	2.5
			t3	2.5
			t4	1.25
			t5	2.5
			t6	2.5

H05.16 **Clear action**

Hexadecimal:	2005-11h	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.

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

Hexadecimal:	2005-12h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	PPR
Max.:	4194303	Data Type:	UInt32
Default:	2500	Change:	At stop

Value Range:

0 PPR to 4194303 PPR

Description

Defines the number of pulses output by PAO or PBO per revolution.
Pulse output resolution per revolution = (H05.17) x 4

H05.19 Speed feedforward control

Hexadecimal:	2005-14h	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: H05.72
3: Zero phase

Description

Defines the source of the speed loop feedforward signal.
When the external speed feedforward is set, the feedforward source is set by H05.72.

H05.20 Condition for positioning completed signal output

Hexadecimal:	2005-15h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Absolute position deviation smaller than the value of H05.21
1: Absolute position deviation smaller than the value of H05.21 , and the position reference after filtering is 0
2: Absolute position deviation smaller than the value of H05.21 , and the position reference before filtering is 0
3: Absolute value of position deviation is kept lower than the value of H05.21 within the time defined by H05.60 and the position reference after filtering is 0
4: Absolute value of position deviation is kept lower than the value of H05.21 within the time defined by H05.60 and the position reference after filtering is 0
5: Absolute value of position deviation is smaller than the value of H05.21, the zero speed signal is active, and the position reference before filtering is 0
6: Absolute value of position deviation is smaller than the value of H05.21, the zero speed signal is active, and the position reference After filtering is 0
7: COIN signal judged after the position reference is changed from available to unavailable before filtering and is kept active for the period defined by H05.60, the position reference before filtering is 0, and the value of position deviation is smaller than the value of H05.21
8: COIN signal judged after the position reference is changed from available to unavailable after filtering and is kept active for the period defined by H05.60, the position reference after filtering is 0, and the value of position deviation is smaller than the value of H05.21
9: COIN signal judged after the position reference is changed from available to unavailable before filtering, with the position deviation kept lower than H05.21 for the period defined by H05.60 or the position reference before filtering being 0
10: COIN signal judged after the position reference is changed from available to unavailable after filtering, with the position deviation kept lower than H05.21 for the period defined by H05.60 or the position reference after filtering being 0

Description

Defines the condition for outputting positioning completed/proximity signal. In the position control mode, if the absolute value of the position deviation during operation is within the setpoint of H05.21, the drive outputs the positioning completed/proximity signal. You can set the condition for outputting the positioning completed/proximity signal in H05.20.

H05.21 Threshold of positioning completed

Hexadeci-mal:	2005-16h	Effective Time:	Real time
Min.:	1	Unit:	Encoder unit
Max.:	65535	Data Type:	UInt16
Default:	5872	Change:	Immediately

Value Range:

1 to 65535

Description

Defines the threshold of the absolute value of position deviation when the drive outputs the positioning completed signal.

H05.22 Proximity threshold

Hexadecimal:	2005-17h	Effective Time:	Real time
Min.:	1	Unit:	Encoder unit
Max.:	65535	Data Type:	UInt16
Default:	65535	Change:	Immediately

Value Range:

1 to 65535

Description

Defines the threshold of the absolute value of position deviation when the drive outputs the proximity signal.

H05.24 Displacement of interrupt positioning

Hexadecimal:	2005-19h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

Defines the position reference value during interrupt positioning.

H05.26 Constant operating speed in interrupt positioning

Hexadecimal:	2005-1Bh	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

0rpm–10000rpm

Description

Defines the maximum speed during interrupt positioning.

H05.27 Acceleration/Deceleration time of interrupt positioning

Hexadecimal:	2005-1Ch	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 time for the motor to change from 0 rpm to 1000 rpm at a constant speed during interrupt positioning.

H05.29 Interrupt positioning cancel signal

Hexadecimal:	2005-1Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: Disabled

1: Enabled

Description

Defines whether to unlock the interrupt positioning signal.

H05.30 Homing selection

Hexadecimal:	2005-1Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Disabled

1: Homing enabled through the HomingStart signal input from DI

2: Electrical homing enabled through the HomingStart signal input from DI

3: Homing started immediately upon power-on

4: Homing executed immediately

5: Electrical homing started

6: Current position as home

8: D-triggered position as home

Description

Defines the homing mode and the trigger signal source.

H05.31 **Homing mode**

Hexadecimal:	2005-20h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Forward, home switch as deceleration point and home
1: Reverse, home switch as deceleration point and home
2: Forward, Z signal as deceleration point and home
3: Reverse, motor Z signal as deceleration point and home
4: Forward, home switch as deceleration point and Z signal as home
5: Reverse, home switch as deceleration point and Z signal as home
6: Forward, positive limit switch as deceleration point and home
7: Reverse, negative limit switch as deceleration point and home
8: Forward, positive limit switch as deceleration point and Z signal as home
9: Reverse, negative limit switch as deceleration point and Z signal as home
10: Forward, mechanical limit position as deceleration point and home
11: Reverse, mechanical limit position as deceleration point and home
12: Forward, mechanical limit position as deceleration point and Z signal as home
13: Reverse, mechanical limit position as deceleration point and Z signal as home
14: Forward single-turn homing
15: Reverse single-turn homing
16: Nearby single-turn homing

Description

Defines the default motor direction of rotation, deceleration point, and home during homing.

H05.32 **Speed in high-speed searching for the home switch signal**

Hexadecimal:	2005-21h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0rpm–3000rpm

Description

Defines the motor speed for searching for the deceleration point signal during homing.

H05.33 Speed in low-speed searching for the home switch signal

Hexadecimal:	2005-22h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0rpm–1000rpm

Description

Defines the motor speed for searching for the home signal during homing.

H05.34 Acceleration/Deceleration time during homing

Hexadecimal:	2005-23h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:

0 ms to 1000 ms

Description

Defines the time for the motor to accelerate from 0 rpm to 1000 rpm at a constant speed during homing.

H05.35 Home search time limit

Hexadecimal:	2005-24h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	Immediately

Value Range:

0–65535

Description

Set the maximum home search time, depending on the setting of H05.66.

H05.36 Mechanical home offset

Hexadecimal:	2005-25h	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.

H05.38 Frequency-division output source

Hexadecimal:	2005-27h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Encoder frequency-division output

1: Pulse reference synchronous output

2: Frequency-division output inhibited

3: Second encoder frequency-division output

4: H31.01 Reference frequency output

Description

Defines the output source of the pulse output terminal.

Set point	Output Source	Remarks
0	Encoder frequency-division output	The encoder feedback signal is outputted only after being divided by the value of H05.17 during rotation of the motor. Encoder frequency-division output mode is recommended when the host controller is used for closed-loop feedback.
1	Pulse reference synchronous output	The input pulse references are outputted synchronously only when H05.00 is set to 0. When the pulses of multi-axis servo is tracked synchronously, synchronous output of pulse references is recommended.
2	Frequency-division output inhibited	No output is generated from pulse output terminals. In this case, frequency-division output terminals act as the input terminals of fully closed-loop external scale signals.
3	Second encoder frequency-division output	The encoder feedback signal is outputted only after being divided by the value of H05.17 during rotation of the motor.

H05.39 Electronic gear ratio switchover condition

Hexadecimal:	2005-28h	Effective Time:	Real time

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

Value Range:

0: Switchover after position reference is kept 0 for 2.5 ms

1: Switched in real time

Description

Defines the condition for switching the electronic gear ratio.

H05.40 Mechanical home offset and action upon overtravel

Hexadecimal:	2005-29h	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.

H05.41 Z pulse output polarity

Hexadecimal:	2005-2Ah	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

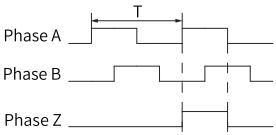
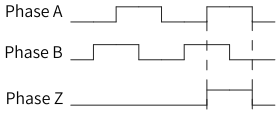
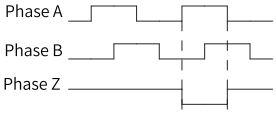
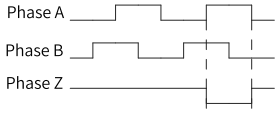
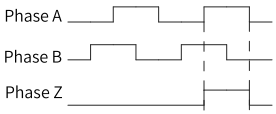
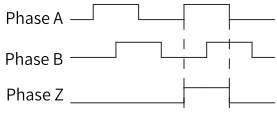
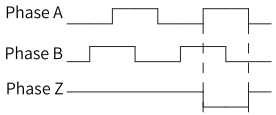
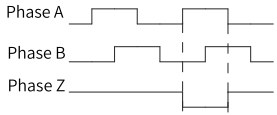
Value Range:

bit	Name	Function
0	Frequency-division Z output polarity	0: Positive (high level upon active Z pulse)
		1: Negative (low level upon active Z pulse)
1	OCZ output polarity	0: Positive (high level upon active Z pulse)
		1: Negative (low level upon active Z pulse)
2	Inner loop probe Z signal source	0: Motor Z signal
		1: Frequency-division output Z signal

Description

Defines the output level when the Z pulse of pulse output terminal is active.

Table 4–4 Pulse diagrams of encoder frequency-division output (H05.38 = 0)

H02.03 (Output pulse phase)	H05.41 (Z pulse output polarity)	Pulse Output Diagram of Forward RUN	Pulse Output Diagram of Reverse RUN
0	0	 Phase A leads phase B by 90°.	 Phase B leads phase A by 90°.
	1	 Phase A leads phase B by 90°.	 Phase B leads phase A by 90°.
1	0	 Phase B leads phase A by 90°.	 Phase A leads phase B by 90°.
	1	 Phase B leads phase A by 90°.	 Phase A leads phase B by 90°.

It is recommended to use the active edge outputted by Z signal when a high precision frequency-division output of Z signal is required.

Setpoint	Z pulse output polarity
0	Positive (high level upon active Z pulse)
1	Negative (low level upon active Z pulse)

H05.41 = 0: Falling-edge triggered; H05.41 = 1: Rising-edge triggered

H05.43 Position pulse edge

Hexadecimal:	2005-2Ch	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Rising edge-triggered

1: Falling edge-triggered

Description

The setpoint 0 indicates calculation starts from the falling edge of pulse input.

The setpoint 1 indicates calculation starts from the rising edge of pulse input.

H05.44 Numerator of frequency-division output reduction ratio

Hexadecimal:	2005-2Dh	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	16383	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1–16383

Description

Defines the numerator of frequency-division output reduction ratio.

H05.45 Denominator of frequency-division output reduction ratio

Hexadecimal:	2005-2Eh	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	8191	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1–8191

Description

Defines the denominator of frequency-division output reduction ratio.

H05.46 DI selection of multi-turn frequency-division Z starting point

Hexadecimal:	2005-2Fh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: No selection
1: DI1
2: DI2
3: DI3
4: DI4
5: DI5
6: DI6
7: DI7
8: DI8

Description

Sets the start point for frequency-division output. It is only effective when the frequency division ratio is greater than 1.

H05.47 Frequency-division Z pulse width

Hexadecimal:	2005-30h	Effective Time:	Real time
Min.:	0	Unit:	us
Max.:	400	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 us to 400 us

Description

Set the minimum output width (us) of frequency division output PZ.

H05.50 Mechanical gear ratio in absolute position rotation mode (numerator)

Hexadecimal:	2005-33h	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)

Hexadecimal:	2005-34h	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)

Hexadecimal:	2005-35h	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)

Hexadecimal:	2005-37h	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

Hexadecimal:	2005-3Bh	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.

H05.59 Positioning window time

Hexadecimal:	2005-3Ch	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

If the positioning deviation is less than the time threshold of positioning completed, the positioning completed signal is active only if the set time threshold is exceeded.

H05.60 Hold time of positioning completed

Hexadecimal:	2005-3Dh	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

Hexadecimal:	2005-43h	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.

H05.70 **Moving average filter time constant 2**

Hexadecimal:	2005-47h	Effective Time:	Real time
Min.:	0.0	Unit:	ms
Max.:	1000.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:
0.0 ms to 1000.0 ms
Description
Defines the moving average filter time constant for the second group of position references.

H05.71 **Motor Z signal width**

Hexadecimal:	2005-48h	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.

H05.72 **External speed feedforward source selection**

Hexadecimal:	2005-49h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
0: 60B1
1: AI1
Description
External speed feedforward source selection

4.7 H06 Speed Control Parameters

H06.00 **Source of main speed reference A**

Hexadecimal:	2006-01h	Effective Time:	Real time

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

Value Range:

0: Digital setting (H06.03)

1: AI1

Description

Defines the source of main speed reference A.

H06.01 Source of auxiliary speed reference B

Hexadecimal:	2006-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Digital setting (H06.03)

1: AI1

5: Multi-speed reference

Description

Defines the source of auxiliary speed reference B.

H06.02 Speed reference source

Hexadecimal:	2006-03h	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.

<table>
<tr><th>Setpoint</th><th>Control mode</th><th>Remarks</th></tr>
<tr><td>0</td><td>Source of main speed reference A</td><td>The reference source is defined by H06.00.</td></tr>
<tr><td>1</td><td>Source of auxiliary speed reference B</td><td>The reference source is defined by H06.01.</td></tr>
<tr><td>2</td><td>A+B</td><td>The reference source is the product of A+B (H06.00+H06.01).</td></tr>
<tr><td>3</td><td>Switched between A and B</td><td>The reference source is switched between A and B as defined by FunIN.4 (Cmd_SEL).
<table><tr><th>State of FunIN.4 (Cmd_SEL)</th><th>Reference Source</th></tr><tr><td>Inactive</td><td>Source of main speed reference A</td></tr><tr><td>Active</td><td>Source of auxiliary speed reference B</td></tr></table></td></tr>
<tr><td>4</td><td>Communication</td><td>The speed reference is defined by operating on H31.09 through communication (unit: 0.001 RPM).</td></tr>
</table>

H06.03 Speed reference set through keypad

Hexadecimal:	2006-04h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	200	Change:	Immediately

Value Range:

–10000 RPM to +10000 RPM

Description

Defines the speed reference value set through the keypad.

H06.04 DI jog speed reference

Hexadecimal:	2006-05h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	150	Change:	Immediately

Value Range:

0rpm–10000rpm

Description
Defines the DI jog speed reference.

H06.05 Acceleration ramp time of speed reference

Hexadecimal:	2006-06h	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
Sets acceleration ramp time of speed reference. The acceleration/deceleration time constant of multi-speed references are defined only by parameters in group H12.
H06.05 defines the time for the speed reference to change from 0 rpm to 1000 rpm.
H06.06 defines the time for the speed reference to change from 1000 rpm to 0 rpm.
The formulas for calculating the actual acceleration/deceleration time are as follows:
Actual acceleration time t1= Speed reference ÷ 1000 x Acceleration ramp time of speed reference
Actual deceleration time t2= Speed reference ÷ 1000 x Deceleration ramp time of speed reference

H06.06 Deceleration ramp time of speed reference

Hexadecimal:	2006-07h	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
Sets deceleration ramp time of speed reference.

H06.07 Maximum speed limit

Hexadecimal:	2006-08h	Effective Time:	Real time
Min.:	0	Unit:	rpm

Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Immediately

Value Range:

0 rpm to 10000 rpm

Description

Defines the maximum speed limit.

H06.08 Forward speed limit

Hexadecimal:	2006-09h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Immediately

Value Range:

0 rpm to 10000 rpm

Description

Defines the forward speed threshold.

H06.09 Reverse speed limit

Hexadecimal:	2006-0Ah	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Immediately

Value Range:

0 rpm to 10000 rpm

Description

Defines the reverse speed threshold.

H06.10 Deceleration unit in emergency stop

Hexadecimal:	2006-0Bh	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**

Hexadecimal:	2006-0Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: No torque feedforward

1: Internal torque feedforward

Description

Defines the source for torque feedforward control.

H06.12 **Acceleration ramp time of jog speed**

Hexadecimal:	2006-0Dh	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

Sets the acceleration ramp time of jog speed.

H06.13 **Speed feedforward smoothing filter**

Hexadecimal:	2006-0Eh	Effective Time:	Real time
Min.:	0	Unit:	us
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 us to 65535 us

Description

Defines the speed feedforward smoothing filter time.

H06.15 **Zero clamp speed threshold**

Hexadecimal:	2006-10h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0rpm–10000rpm

Description

Defines the zero clamp speed threshold.

H06.16 Threshold of TGON (motor rotation) signal

Hexadecimal:	2006-11h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	20	Change:	Immediately

Value Range:

0rpm–1000rpm

Description

Sets the threshold of TGON (motor rotation) signal.

H06.17 Threshold of V-Cmp (speed matching) signal

Hexadecimal:	2006-12h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	100	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 rpm to 100 rpm

Description

Defines the threshold of speed match signal.

H06.18 Threshold of speed reach signal

Hexadecimal:	2006-13h	Effective Time:	Real time
Min.:	20	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:

20rpm–10000rpm

Description

Defines the threshold of speed reached signal.

H06.19 Threshold of zero speed output signal

Hexadecimal:	2006-14h	Effective Time:	Real time
Min.:	1	Unit:	rpm

Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

Defines the threshold of zero speed output signal.

H06.40 Deceleration time of ramp 1

Hexadecimal:	2006-29h	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

Set ramp 1 deceleration time.

H06.41 Deceleration time of ramp 2

Hexadecimal:	2006-2Ah	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

Set ramp 2 deceleration time.

H06.50 Speed S-curve enable switch

Hexadecimal:	2006-33h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	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 1 of speed S-curve acceleration segment**

Hexadecimal:	2006-34h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.52 **Decreasing acceleration 1 of speed S-curve acceleration segment**

Hexadecimal:	2006-35h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.53 **Decreasing deceleration 1 of speed S-curve deceleration segment**

Hexadecimal:	2006-36h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.54 **Decreasing acceleration 1 of speed S-curve deceleration segment**

Hexadecimal:	2006-37h	Effective Time:	Real time

Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.55 Increasing acceleration 2 of speed S-curve acceleration segment

Hexadecimal:	2006-38h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.56 Decreasing acceleration 2 of speed S-curve acceleration segment

Hexadecimal:	2006-39h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.57 Decreasing deceleration 2 of speed S-curve deceleration segment

Hexadecimal:	2006-3Ah	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16

Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.58 Decreasing acceleration 2 of speed S-curve deceleration segment

Hexadecimal:	2006-3Bh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.59 Increasing acceleration 3 of speed S-curve acceleration segment

Hexadecimal:	2006-3Ch	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.60 Decreasing acceleration 3 of speed S-curve acceleration segment

Hexadecimal:	2006-3Dh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.61 Decreasing deceleration 3 of speed S-curve deceleration segment

Hexadecimal:	2006-3Eh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.62 Decreasing acceleration 3 of speed S-curve deceleration segment

Hexadecimal:	2006-3Fh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.63 Increasing acceleration 4 of speed S-curve acceleration segment

Hexadecimal:	2006-40h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.64 Decreasing acceleration 4 of speed S-curve acceleration segment

Hexadecimal:	2006-41h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.65 Decreasing deceleration 4 of speed S-curve deceleration segment

Hexadecimal:	2006-42h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.66 Decreasing acceleration 4 of speed S-curve deceleration segment

Hexadecimal:	2006-43h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.67 Increasing acceleration 5 of speed S-curve acceleration segment

Hexadecimal:	2006-44h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.68 Decreasing acceleration 5 of speed S-curve acceleration segment

Hexadecimal:	2006-45h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.69 Decreasing deceleration 5 of speed S-curve deceleration segment

Hexadecimal:	2006-46h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.70 Decreasing acceleration 5 of speed S-curve deceleration segment

Hexadecimal:	2006-47h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.71 Increasing acceleration 6 of speed S-curve acceleration segment

Hexadecimal:	2006-48h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.72 Decreasing acceleration 6 of speed S-curve acceleration segment

Hexadecimal:	2006-49h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.73 Decreasing deceleration 6 of speed S-curve deceleration segment

Hexadecimal:	2006-4Ah	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.74 Decreasing acceleration 6 of speed S-curve deceleration segment

Hexadecimal:	2006-4Bh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.75 Increasing acceleration 7 of speed S-curve acceleration segment

Hexadecimal:	2006-4Ch	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.76 Decreasing acceleration 7 of speed S-curve acceleration segment

Hexadecimal:	2006-4Dh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.77 Decreasing deceleration 7 of speed S-curve deceleration segment

Hexadecimal:	2006-4Eh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.78 Decreasing acceleration 7 of speed S-curve deceleration segment

Hexadecimal:	2006-4Fh	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:

0.0% to 100.0%

Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

H06.79 Increasing acceleration 8 of speed S-curve acceleration segment

Hexadecimal:	2006-50h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

H06.80 Decreasing acceleration 8 of speed S-curve acceleration segment

Hexadecimal:	2006-51h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

H06.81 Decreasing deceleration 8 of speed S-curve deceleration segment

Hexadecimal:	2006-52h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

H06.82 Decreasing acceleration 8 of speed S-curve deceleration segment

Hexadecimal:	2006-53h	Effective Time:	Real time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	At stop

Value Range:
0.0% to 100.0%
Description
8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

4.8 H07 Torque Control Parameters

H07.00 Source of main torque reference A

Hexadecimal:	2007-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Keypad (H7.03)
1: AI1
Description
Defines the source of the main torque reference A.

H07.01 Source of auxiliary torque reference B

Hexadecimal:	2007-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:
0: Keypad (H7.03)
1: AI1

Description

Defines the source of auxiliary torque references.

H07.02 Torque reference source

Hexadecimal:	2007-03h	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 torque reference.

<table>
<tr><th>Setpoint</th><th>Control mode</th><th>Remarks</th></tr>
<tr><td>0</td><td>Source of main torque reference A</td><td>The reference source is defined by H07.00.</td></tr>
<tr><td>1</td><td>Source of auxiliary torque reference B</td><td>The reference source is defined by H07.01.</td></tr>
<tr><td>2</td><td>A+B</td><td>The reference source is the product of A+B (H07.00+H07.01).</td></tr>
<tr><td>3</td><td>Switched between A and B</td><td>The reference source is switched between A and B as defined by FunIN.4 (Cmd_SEL).
<table>
<tr><th>State of FunIN.4 (Cmd_SEL)</th><th>Reference Source</th></tr>
<tr><td>Inactive</td><td>Source of main torque reference A</td></tr>
<tr><td>Active</td><td>Source of auxiliary torque reference B</td></tr>
</table></td></tr>
<tr><td>4</td><td>Communication</td><td>The torque reference is defined by operating on H31.11 through communication.</td></tr>
</table>

H07.03 Torque reference set through keypad

Hexadecimal:	2007-04h	Effective Time:	Real time
Min.:	-400.0	Unit:	%
Max.:	400.0	Data Type:	Int16

Default:	0.0	Change:	Immediately

Value Range:

-400.0% to 400.0%

Description

Sets torque reference set through keypad.

H07.05 Torque reference filter time constant 1

Hexadecimal:	2007-06h	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 the torque reference filter time constant 1.

H07.06 Torque reference filter time constant 2

Hexadecimal:	2007-07h	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 the torque reference filter time constant 2.

H07.07 Torque limit source

Hexadecimal:	2007-08h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Positive/Negative internal torque limit

1: Internal or external limit as defined by DI

2: T-LMT

3: T_LMT or external limit as defined by DI (FunIN.16 or FunIN.17)

4: T_LMT or internal limit (FunIN.16 or FunIN.17) as defined by DI

Description
Sets the torque limit source.

H07.08 T-LMT selection

Hexadecimal:	2007-09h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
1: AI1
Description
Sets the AI as the torque limit source.

H07.09 Positive internal torque limit

Hexadecimal:	2007-0Ah	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
Sets the forward run internal torque limit.

H07.10 Negative internal torque limit

Hexadecimal:	2007-0Bh	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
Sets the reverse run internal torque limit.

H07.11 Positive external torque limit

Hexadecimal:	2007-0Ch	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

Sets the positive external torque limit.

H07.12 Negative external torque limit

Hexadecimal:	2007-0Dh	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

Sets the negative external torque limit.

H07.15 Emergency-stop torque

Hexadecimal:	2007-10h	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

Hexadecimal:	2007-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Internal speed limit

1: V-LMT

2: H07.19 or H07.20 as defined by DI

Description

Sets the speed limit source.

H07.18 V-LMT selection

Hexadecimal:	2007-13h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

1: AI1

Description

Sets the AI as the speed limit source.

H07.19 Positive speed limit/Speed limit 1 in torque control

Hexadecimal:	2007-14h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	Immediately

Value Range:

0rpm–10000rpm

Description

Defines the positive speed limit in torque control.

H07.20 Negative speed limit/Speed limit 2 in torque control

Hexadecimal:	2007-15h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	Immediately

Value Range:

0rpm–10000rpm

Description

Defines the negative speed limit in torque control.

H07.21 Base value for torque reach

Hexadecimal:	2007-16h	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 of the base value for torque reach.

H07.22 Torque reach valid value

Hexadecimal:	2007-17h	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 for torque reach DO active.

H07.23 Torque reach invalid value

Hexadecimal:	2007-18h	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 for torque reach DO inactive.

H07.24 Field weakening depth

Hexadecimal:	2007-19h	Effective Time:	Real time
Min.:	60	Unit:	%
Max.:	115	Data Type:	UInt16
Default:	115	Change:	Immediately

Value Range:

60% to 115%

Description

Set the flux eakening depth.

H07.25 Max. permissible demagnetizing current

Hexadecimal:	2007-1Ah	Effective Time:	Real time
Min.:	0	Unit:	%
Max.:	300	Data Type:	UInt16

Default:	100	Change:	Immediately

Value Range:

0% to 300%

Description

Set the maximum allowable demagnetization current value.

H07.26 Field weakening selection

Hexadecimal:	2007-1Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Disable or enable field weakening.

H07.27 Flux weakening gain

Hexadecimal:	2007-1Ch	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

Set the gain of flux weakening.

H07.28 Speed of field weakening point

Hexadecimal:	2007-1Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

Set the speed of flux weakening point.

H07.35 Torque non-standard feature enable

Hexadecimal:	2007-24h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

bit0: Motor output correction enable

bit1: Shield compensation data enable

Description

Torque non-standard feature enable switch.

H07.36 Time constant of low-pass filter 2

Hexadecimal:	2007-25h	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

Sets the time constant of low-pass filter 2.

H07.37 Torque reference filter selection

Hexadecimal:	2007-26h	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

Select torque reference Filter.

H07.38 Biquad filter attenuation ratio

Hexadecimal:	2007-27h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	50	Data Type:	UInt16
Default:	16	Change:	At stop

Value Range:
0–50
Description
Set the attenuation ratio of biquad filter.

H07.40 Speed limit window in the torque control mode

Hexadecimal:	2007-29h	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 window in the torque control mode.

4.9 H08 Gain Parameters

H08.00 Speed loop gain

Hexadecimal:	2008-01h	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

Hexadecimal:	2008-02h	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**

Hexadecimal:	2008-03h	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**

Hexadecimal:	2008-04h	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**

Hexadecimal:	2008-05h	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**

Hexadecimal:	2008-06h	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**

Hexadecimal:	2008-09h	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**

Hexadecimal:	2008-0Ah	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.

Set point	Gain switchover condition	Remarks
0	Fixed to the 1st gain set	The 1st gain set applies.
1	Switched as defined by bit26 of 60FEh	-
2	Torque reference too large	If the torque reference absolute value exceeds (Level + Dead time) [%] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of the torque reference is lower than (level – Dead time) [%] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.
3	Speed reference too large	If the speed reference absolute value exceeds (Level + Dead time) [rpm] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of the speed reference is lower than (level - Dead time) [rpm] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.
4	Speed reference too large	Active in the control modes other than speed control If the absolute value of the change rate of the speed reference exceeds (Level + Dead time) [10 rpm/s] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of the speed reference change rate is lower than (level – hysteresis) [10 rpm/s] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. In the speed control mode, the 1st gain set always applies.
5	Speed reference high/low-speed threshold	If the speed reference absolute value exceeds (Level - Dead time) [rpm] in the last 1st gain set, the drive starts to switch to the 2nd gain set, with gains changed gradually. When the speed reference absolute value reaches (Level + Dead time) [rpm], the 2nd gain set applies. If the speed reference absolute value is lower than (Level + Dead time) [rpm] in the last 2nd gain set, the drive starts to return to the 1st gain set, with gains changed gradually. When the speed reference absolute value reaches (Level - Dead time) [rpm], the 1st gain set applies.

Set point	Gain switchover condition	Remarks
6	Position deviation too large	Active only in position control and full closed-loop control. If the position deviation absolute value exceeds (Level + Dead time) [encoder unit] in the last 1st gain set, the drive switches to the 2nd gain set. When the absolute value of the position deviation is lower than (Level - Dead time) [encoder unit] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
7	Position reference available	Active only in position control and full closed-loop control. If the position reference is not 0 in the last 1st gain set, the drive switches to the 2nd gain set. When the position reference is 0 and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
8	Positioning uncompleted	Active only in position control and full closed-loop control. If positioning has not been completed in the last 1st gain set, the drive switches to the 2nd gain set. If positioning is not completed and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the servo drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
9	Actual speed too high	Active only in position control and full closed-loop control. If the absolute value of actual speed exceeds (Level + Dead time) [rpm] in the last 1st gain set, the drive switches to the 2nd gain set. If the absolute value of actual speed is lower than (Level - Dead time) [rpm] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the drive returns to the 1st gain set. If the drive is not in position control or full closed-loop control, the 1st gain set always applies.
10	Position reference + Actual speed	Active only in position control and full closed-loop control. If the position reference is not 0 in the last 1st gain set, the drive switches to the 2nd gain set. If the position reference is 0 and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the 2nd gain set applies. When the position reference is 0 and the delay defined by (H08.10) is reached, if the absolute value of actual speed is lower than (Level) [rpm], the speed loop integral time constant is fixed to the setpoint of H08.04 (2nd speed loop integral time constant), and others return to the 1st gain set; if the absolute value of actual speed does not reach (Level - Dead time) [rpm], the speed integral also returns to the setpoint of H08.01 (Speed loop integral time constant). If the drive is not in position control or full closed-loop control, the 1st gain set always applies.

H08.10 Gain switchover delay

Hexadecimal:	2008-0Bh	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

Hexadecimal:	2008-0Ch	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

Hexadecimal:	2008-0Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20000	Data Type:	UInt16
Default:	30	Change:	Immediately

Value Range:

0 to 20000

Description

Defines the dead time for gain switchover.

Gain switchover is affected by both the level and the dead time, as defined by H08.09. The unit of gain switchover hysteresis varies with the switchover condition.

Note:

The set value of H08.11 (Gain switchover level) must be no less than that of H08.12; otherwise, the H08.11 will be set to a value equal to H08.12 automatically.

H08.13 Position gain switchover time

Hexadecimal:	2008-0Eh	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

Hexadecimal:	2008-10h	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.

H08.17 Zero phase delay

Hexadecimal:	2008-12h	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

Hexadecimal:	2008-13h	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

Hexadecimal:	2008-14h	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

Hexadecimal:	2008-15h	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

Hexadecimal:	2008-16h	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

Hexadecimal:	2008-17h	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

Hexadecimal:	2008-18h	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

Hexadecimal:	2008-19h	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

Hexadecimal:	2008-1Ch	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**

Hexadecimal:	2008-1Dh	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**

Hexadecimal:	2008-1Eh	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.

H08.31 **Disturbance cutoff frequency**

Hexadecimal:	2008-20h	Effective Time:	Real time
Min.:	1	Unit:	Hz
Max.:	4000	Data Type:	UInt16
Default:	600	Change:	Immediately

Value Range:

1 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**

Hexadecimal:	2008-21h	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

Hexadecimal:	2008-22h	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

Hexadecimal:	2008-26h	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

Hexadecimal:	2008-27h	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

Hexadecimal:	2008-28h	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

Hexadecimal:	2008-29h	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

Hexadecimal:	2008-2Bh	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**

Hexadecimal:	2008-2Ch	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.

H08.46 **Feedforward value**

Hexadecimal:	2008-2Fh	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.

H08.53 **Medium- and low-frequency jitter suppression frequency 3**

Hexadecimal:	2008-36h	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**

Hexadecimal:	2008-37h	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

Hexadecimal:	2008-39h	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

Hexadecimal:	2008-3Ch	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

Hexadecimal:	2008-3Dh	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**

Hexadecimal:	2008-3Eh	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**

Hexadecimal:	2008-3Fh	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**

Hexadecimal:	2008-40h	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**

Hexadecimal:	2008-41h	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

Hexadecimal:	2008-42h	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

Hexadecimal:	2008-43h	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.

H08.68 Speed feedforward of zero deviation control

Hexadecimal:	2008-45h	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

Hexadecimal:	2008-46h	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.

H08.81 Anti-resonance frequency of dual-inertia model

Hexadecimal:	2008-52h	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

Hexadecimal:	2008-53h	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

Hexadecimal:	2008-54h	Effective Time:	Real time
Min.:	0.1	Unit:	1/s
Max.:	300.0	Data Type:	UInt16
Default:	60.0	Change:	Immediately

Value Range:
0.1/s to 300.0/s
Description
Defines the dual-inertia model gain.

H08.84 Inertia ratio of dual-inertia model

Hexadecimal:	2008-55h	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

Hexadecimal:	2008-59h	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

Hexadecimal:	2008-5Ah	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.

4.10 H09 Auto-tuning Parameters

H09.00 Gain auto-tuning mode

Hexadecimal:	2009-01h	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

Hexadecimal:	2009-02h	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

Hexadecimal:	2009-03h	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

Hexadecimal:	2009-04h	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

Hexadecimal:	2009-06h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	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

Hexadecimal:	2009-07h	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

Hexadecimal:	2009-08h	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

Hexadecimal:	2009-09h	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

Hexadecimal:	2009-0Ah	Effective Time:	Real time
Min.:	0.00	Unit:	-
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Immediately

Value Range:
0.00 to 100.00
Description
Defines the motor revolutions per inertia auto-tuning when H09.05 (Offline inertia auto-tuning mode) is set to 1 (Positive/Negative triangular wave mode).
Note:
When using the offline inertia auto-tuning function, check that the travel distance of the motor at the stop position is larger than the value of H09.09. If not, decrease the value of H09.06 (Maximum speed for inertia auto-tuning) or H09.07 (Time constant of accelerating to max. speed during inertia auto-tuning) properly until the motor travel distance fulfills the requirement.

H09.11 Vibration threshold

Hexadecimal:	2009-0Ch	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

Hexadecimal:	2009-0Dh	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

Hexadecimal:	2009-0Eh	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

Hexadecimal:	2009-0Fh	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

Hexadecimal:	2009-10h	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

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H09.16 Width level of the 2nd notch

Hexadecimal:	2009-11h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

0–20

Description

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H09.17 **Depth level of the 2nd notch**

Hexadecimal:	2009-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–99

Description

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H09.18 **Frequency of the 3rd notch**

Hexadecimal:	2009-13h	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**

Hexadecimal:	2009-14h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

0–20

Description

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H09.20 **Depth level of the 3rd notch**

Hexadecimal:	2009-15h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16

Default:	0	Change:	Immediately

Value Range:

0–99

Description

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H09.21 Frequency of the 4th notch

Hexadecimal:	2009-16h	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

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H09.22 Width level of the 4th notch

Hexadecimal:	2009-17h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

0–20

Description

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H09.23 Depth level of the 4th notch

Hexadecimal:	2009-18h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–99

Description

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H09.24 Auto-tuned resonance frequency

Hexadecimal:	2009-19h	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

Hexadecimal:	2009-1Bh	Effective Time:	Real time
Min.:	30.0	Unit:	%
Max.:	600.0	Data Type:	UInt16
Default:	100.0	Change:	Immediately

Value Range:

30.0% to 600.0%

Description

Defines ITune response capability. Increasing the setpoint improves the responsiveness but may incur resonance.

H09.27 ITune mode

Hexadecimal:	2009-1Ch	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

Function: Setting H09.27 to 1 enables the ITune function.

Note: ITune mode 2 is manufacturer commissioning mode, which should be used with caution.

H09.28 Minimum inertia ratio of ITune

Hexadecimal:	2009-1Dh	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

Used to adjust the inertia ratio range controlled by ITune. : Default minimum inertia of ITune is 0.0
Max. inertia of ITune is 30.0.
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

Hexadecimal:	2009-1Eh	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

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H09.32 Gravity compensation value

Hexadecimal:	2009-21h	Effective Time:	Real time
Min.:	-100.0	Unit:	%
Max.:	100.0	Data Type:	Int16
Default:	0.0	Change:	Immediately

Value Range:

-100.0% 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

Hexadecimal:	2009-22h	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

Hexadecimal:	2009-23h	Effective Time:	Real time
Min.:	-100.0	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

Hexadecimal:	2009-24h	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

Hexadecimal:	2009-25h	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

Hexadecimal:	2009-26h	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

Hexadecimal:	2009-27h	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

Hexadecimal:	2009-28h	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.

H09.44 Frequency of low-frequency resonance suppression 2 at mechanical load end

Hexadecimal:	2009-2Dh	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

Hexadecimal:	2009-2Eh	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

Hexadecimal:	2009-30h	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

Hexadecimal:	2009-32h	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

Hexadecimal:	2009-33h	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

Hexadecimal:	2009-35h	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

Hexadecimal:	2009-37h	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

Hexadecimal:	2009-39h	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

Hexadecimal:	2009-3Ah	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

Hexadecimal:	2009-3Bh	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.

4.11 H0A Fault and Protection Parameters

H0A.00 **Power input phase loss protection**

Hexadecimal:	200A-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Enable

1: Disable

Description

Servo drives supporting single-phase/three-phase 220 V and three-phase 380 V power supplies are available. When voltage fluctuation or phase loss occurs on the power supply, the drive triggers power input phase loss protection based on H0A.00.

H0A.01 **Absolute position limit**

Hexadecimal:	200A-02h	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**

Hexadecimal:	200A-05h	Effective Time:	Real time
Min.:	50	Unit:	-
Max.:	300	Data Type:	UInt16

Default:	100	Change:	Immediately

Value Range:

50 to 300

Description

Determines the motor overload duration before E620.0 (Motor overload) is reported.

You can change the setpoint to advance or delay the time when overload protection is triggered based on the motor temperature. The setpoint 50% indicates the time is cut by half; 150% indicates the time is increased by 50%. Set this parameter based on the actual temperature of the motor.

H0A.08 Overspeed threshold

Hexadecimal:	200A-09h	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.

Setpoint	Overspeed Threshold	Condition for Reporting E500.0
0	Maximum motor speed x 1.2	If the speed feedback exceeds the overspeed threshold several times, the drive reports E500.0 (Motor overspeed).
1 to 10000	If H0A-08 ⩾ (Maximum motor speed x 1.2): Overspeed threshold = Maximum motor speed x 1.2	
	If H0A-08 < (Maximum motor speed x 1.2): Overspeed threshold = H0A.08	

H0A.09 Max. pulse input frequency in position control

Hexadecimal:	200A-0Ah	Effective Time:	Real time
Min.:	100	Unit:	kHz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	At stop

Value Range:

100 kHz to 8000 kHz

Description

Defines the maximum frequency of input pulses when the position reference source is pulse reference (H05.00 = 0) in the position control mode.
When the actual pulse input frequency exceeds the value of H0A.09, the drive reports EB01.0 (Position reference input error).

H0A.10 Threshold of excessive local position deviation

Hexadecimal:	200A-0Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	27486951	Change:	Immediately

Value Range:
0 to 4294967295
Description
Defines the threshold for excessive position deviation in the position control mode.
When the position deviation exceeds this threshold, the drive reports EB00.0 (Position deviation too large).

H0A.12 Runaway protection

Hexadecimal:	200A-0Dh	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.17 Reference pulse selection

Hexadecimal:	200A-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Pulse unit
1: Reference unit

Description

Defines the unit for the position settings in H05.21, H05.22, and H0A.10.

H0A.18 IGBT over-temperature threshold

Hexadecimal:	200A-13h	Effective Time:	Real time
Min.:	120	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	140	Change:	Immediately

Value Range:

120°C to 175°C

Description

Defines the threshold for reporting E640.0 (IGBT overtemperature) and E640.1 (Flywheel diode overtemperature).

H0A.19 Filter time constant of touch probe 1

Hexadecimal:	200A-14h	Effective Time:	Real time
Min.:	0.00	Unit:	us
Max.:	6.30	Data Type:	UInt16
Default:	2.00	Change:	Immediately

Value Range:

0.00us–6.30us

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

Hexadecimal:	200A-15h	Effective Time:	Real time
Min.:	0.00	Unit:	us
Max.:	6.30	Data Type:	UInt16
Default:	2.00	Change:	Immediately

Value Range:

0.00us–6.30us

Description

Defines the filter time of touch probe 2. An active input must last for the time defined by H0A.20.

H0A.23 TZ signal filter time

Hexadecimal:	200A-18h	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.24 Filter time constant of low-speed pulse input pin

Hexadecimal:	200A-19h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	25 ns
Max.:	255	Data Type:	UInt16
Default:	30	Change:	At stop

Value Range:

0 ns to 255 ns

Description

Defines the filter time constant of low-speed pulse input terminal which is enabled (H05.01 = 0) when the position reference source is pulse input (H05.00 = 0) in the position control mode.

When peak interference exists in the low-speed pulse input terminal, set this parameter to suppress peak interference and prevent motor malfunction due to interference signal inputted to the servo drive.

H0A.25 Speed display DO low-pass filter time

Hexadecimal:	200A-1Ah	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	5000	Data Type:	UInt16
Default:	0	Change:	At stop

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

Hexadecimal:	200A-1Bh	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

Hexadecimal:	200A-1Ch	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	50	Change:	At stop

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.29 Fully closed-loop encoder (ABZ) filter time

Hexadecimal:	200A-1Eh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	25 ns
Max.:	65535	Data Type:	UInt16
Default:	4111	Change:	At stop

Value Range:

bit0–bit7: Fully closed loop encoder (ABZ) pulse signal filtering time

bit8–bit15: Fully closed loop encoder (ABZ) wire breakage filter time

Description

-

H0A.30 Filter time constant of high-speed pulse input pin

Hexadecimal:	200A-1Fh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	ns
Max.:	255	Data Type:	UInt16
Default:	3	Change:	At stop

Value Range:

0 ns to 255 ns

Description

Defines the filter time constant of high-speed pulse input terminal which is enabled (H05.01 = 1) when the position reference source is pulse reference (H05.00 = 0) in the position control mode.

When peak interference exists in the high-speed pulse input terminal, set this parameter to suppress peak interference and prevent motor malfunction due to interference signal inputted to the servo drive.

H0A.32 Motor stall over-temperature protection time window

Hexadecimal:	200A-21h	Effective Time:	Real time
Min.:	10	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

10 ms to 65535 ms

Description

Defines the overtemperature duration before E630.0 (Motor stall) is detected by the servo drive.

H0A.32 can be used to adjust the sensitivity of motor stall overtemperature detection.

H0A.33 Motor stall over-temperature detection

Hexadecimal:	200A-22h	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

Hexadecimal:	200A-25h	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

Hexadecimal:	200A-29h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	15	Data Type:	UInt16
Default:	6	Change:	At stop

Value Range:

bit	Name	Function
0	Overtravel compensation	0: Enabled
		1: Disabled
1	Probe rising edge compensation	0: Disabled
		1: Enabled
2	Probe falling edge compensation	0: Disabled
		1: Enabled
3	Probe solution	0: New solution
		1: Old solution (same as SV660N)

Description

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H0A.41 Forward position of software position limit

Hexadecimal:	200A-2Ah	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

Hexadecimal:	200A-2Ch	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

Hexadecimal:	200A-32h	Effective Time:	Real time
Min.:	100	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	140	Change:	Immediately

Value Range:
100°C to 175°C
Description
Defines the temperature threshold for regenerative resistor overload.

H0A.50 Encoder communication fault tolerance threshold

Hexadecimal:	200A-33h	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

Hexadecimal:	200A-34h	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

Hexadecimal:	200A-35h	Effective Time:	Real time
Min.:	0	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	125	Change:	Immediately

Value Range:

0°C to 175°C

Description

Defines the temperature threshold for encoder overtemperature protection.

H0A.53 Probe DI ON compensation time

Hexadecimal:	200A-36h	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

Hexadecimal:	200A-37h	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

Hexadecimal:	200A-38h	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

Hexadecimal:	200A-39h	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

Hexadecimal:	200A-3Ah	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

Hexadecimal:	200A-3Bh	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

Hexadecimal:	200A-3Ch	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

Hexadecimal:	200A-3Dh	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

Hexadecimal:	200A-3Eh	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**

Hexadecimal:	200A-3Fh	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**

Hexadecimal:	200A-40h	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**

Hexadecimal:	200A-42h	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

Hexadecimal:	200A-43h	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

Hexadecimal:	200A-44h	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

Hexadecimal:	200A-47h	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**

Hexadecimal:	200A-48h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	4098	Change:	Immediately

Value Range:

0 to 65535

Description

Bit 0:
0: New overload curve
1: Old overload curve
bit1:
0: Enable discharging switch upon power failure
1: Hide discharging switch upon power failure
bit12:
0: Homing completed flag bit not saved on power failure
1: Homing completed flag bit saved on power failure
bit15:0: Interrupt positioning determined by motor running direction
1: Interrupt positioning determined by the sign of H05.24

H0A.72 **Maximum stop time in ramp-to-stop**

Hexadecimal:	200A-49h	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**

Hexadecimal:	200A-4Ah	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

Hexadecimal:	200A-4Bh	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

Hexadecimal:	200A-4Ch	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.90 Moving average filter time for speed display values

Hexadecimal:	200A-5Bh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At stop

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**

Hexadecimal:	200A-5Ch	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At stop

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**

Hexadecimal:	200A-5Dh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At stop

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**

Hexadecimal:	200A-5Eh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16
Default:	0	Change:	At stop

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**

Hexadecimal:	200A-5Fh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms to 250 ms

Description
Defines the filter time constant for thermal display values.

4.12 H0b Monitoring Parameters

H0b.00 Motor speed actual value

Hexadecimal:	200b-01h	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

Hexadecimal:	200b-02h	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

Hexadecimal:	200b-03h	Effective Time:	-
Min.:	-500.0	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

Hexadecimal:	200b-04h	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

Hexadecimal:	200b-06h	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

Hexadecimal:	200b-08h	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

Hexadecimal:	200b-0Ah	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

Hexadecimal:	200b-0Bh	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

Hexadecimal:	200b-0Dh	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.13 Input reference counter

Hexadecimal:	200b-0Eh	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 number of position references not divided or multiplied by the electronic gear ratio during operation.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0b.15 Position following error (encoder unit)

Hexadecimal:	200b-10h	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

Hexadecimal:	200b-12h	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

Hexadecimal:	200b-14h	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

Hexadecimal:	200b-16h	Effective Time:	-
Min.:	-12.00	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

Hexadecimal:	200b-19h	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.25 Angle obtained upon voltage injection auto-tuning

Hexadecimal:	200b-1Ah	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
-

H0b.26 Bus voltage

Hexadecimal:	200b-1Bh	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

Hexadecimal:	200b-1Ch	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

Hexadecimal:	200b-1Dh	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

Hexadecimal:	200b-1Eh	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

Hexadecimal:	200b-1Fh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0–65535
Description
-

H0b.31 Encoder fault information

Hexadecimal:	200b-20h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0–65535
Description
-

H0b.33 Fault log

Hexadecimal:	200b-22h	Effective 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

Hexadecimal:	200b-23h	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

Hexadecimal:	200b-24h	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

Hexadecimal:	200b-26h	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

Hexadecimal:	200b-27h	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

Hexadecimal:	200b-28h	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

Hexadecimal:	200b-29h	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

Hexadecimal:	200b-2Ah	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

Hexadecimal:	200b-2Ch	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

-

H0b.45 Internal fault code

Hexadecimal:	200b-2Eh	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

Hexadecimal:	200b-2Fh	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

Hexadecimal:	200b-30h	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

Hexadecimal:	200b-31h	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

Hexadecimal:	200b-32h	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

Hexadecimal:	200b-34h	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

Hexadecimal:	200b-35h	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)

Hexadecimal:	200b-36h	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

Hexadecimal:	200b-38h	Effective Time:	-
Min.:	-2147483648.0	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

Hexadecimal:	200b-3Ah	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)

Hexadecimal:	200b-3Bh	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)

Hexadecimal:	200b-3Dh	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

Hexadecimal:	200b-40h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0: Normal
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.64 Real-time input position reference counter

Hexadecimal:	200b-41h	Effective Time:	-
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Displays the value of the pulse reference counter before being divided or multiplied by the electronic gear ratio. This value is independent of the servo drive status and the control mode.

H0b.66 Encoder temperature

Hexadecimal:	200b-43h	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

Hexadecimal:	200b-44h	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

Hexadecimal:	200b-47h	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

Hexadecimal:	200b-48h	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

Hexadecimal:	200b-4Bh	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)

Hexadecimal:	200b-4Eh	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)

Hexadecimal:	200b-50h	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)

Hexadecimal:	200b-52h	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)

Hexadecimal:	200b-54h	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)

Hexadecimal:	200b-56h	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

Hexadecimal:	200b-58h	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

Hexadecimal:	200b-5Bh	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

Hexadecimal:	200b-5Ch	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

-

H0b.93 Closed loop state

Hexadecimal:	200b-5Eh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0: Half closed loop

1: Fully closed loop

Description

Displays the closed loop state in position control mode.

H0b.94 Individual power-on time

Hexadecimal:	200b-5Fh	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

Hexadecimal:	200b-61h	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.98 Dynamic braking resistor load rate

Hexadecimal:	200b-63h	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

Display dynamic braking resistor load rate.

4.13 H0d Auxiliary Parameters

H0d.00 Software Reset

Hexadecimal:	200d-01h	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

Hexadecimal:	200d-02h	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

Hexadecimal:	200d-03h	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.04 Read/write in encoder ROM

Hexadecimal:	200d-05h	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

Hexadecimal:	200d-06h	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

Hexadecimal:	200d-0Bh	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

Hexadecimal:	200d-0Dh	Effective Time:	Real time
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

Hexadecimal:	200d-12h	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

Hexadecimal:	200d-13h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:

0 to 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

Hexadecimal:	200d-14h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 to 31

Description

Defines whether the DO functions assigned in group H04 are active when forced DO is active (H0d.17 = 2 or 3).
The value of H0d.19 is displayed as a hexadecimal on the keypad. When it is converted to a binary value, "bit(n) = 1" indicates the DO function is active; "bit (n) = 0" indicates the DO function is inactive.

H0d.20 Absolute encoder reset selection

Hexadecimal:	200d-15h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: No operation
1: Reset fault
2: Reset fault and multi-turn data
3: Reset Inovance 2nd encoder fault
4: Reset Inovance 2nd encoder fault and multi-turn data
Description
You can reset the encoder error or the multi-turn data fed back by the encoder by setting H0d.20.

H0d.23 Torque fluctuation auto-tuning

Hexadecimal:	200d-18h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0–1
Description
-

4.14 H0E Communication Function Parameters

H0E.00 Node address

Hexadecimal:	200E-01h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:
1 to 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**

Hexadecimal:	200E-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
0: Not save
1: Save parameters
2: Save object dictionaries
3: Save parameters and object dictionaries
4: Save object dictionaries written before communication (OP)
255: Determine through H0E03 and H0E04
Description
-

H0E.03 **Save objects written through software (commissioning protocol) to e2prom**

Hexadecimal:	200E-04h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
0: Do not save
1: Save
Description
Saves objects written through software (commissioning protocol) to e2prom, including the parameter and object dictionary.

H0E.04 **Save objects written through communication to e2prom (excluding commissioning protocol)**

Hexadecimal:	200E-05h	Effective Time:	Real time
Min.:	0	Unit:	-

Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Do not save

1: Save

Description

You can use this parameter to determine whether to save communication written data in e2prom (excluding commissioning protocol) (CANOpen, CANLink, Ethernet COE, ModBus485). The data include the function code and object dictionary

H0E.07 Object dictionary unit selection

Hexadecimal:	200E-08h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Reference unit system (p/s, p/s2)

1: User unit system (0.01 rpm, ms)

Description

Servo unit system switching:

0: Use reference unit system. The speed type dictionary unit is p/s, and the acceleration type object dictionary is p/s2.

1: Use the user unit system. The speed type object dictionary unit is 0.01 rpm, and the acceleration type object dictionary unit is the time (ms) taken to change from 0 rpm to 1000 rpm.

H0E.10 CAN selection

Hexadecimal:	200E-0Bh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0: Pulse/Axis control command

1: Enhanced axis control command

2: CANopen

Description

Indicates the CAN application layer:

0: Pulse/Axis control command
1: Enhanced axis control command
2: CANopen
To use CiA402 motion control protocol, set H02.00 to 8 and H0E.10 to 2.
If you only CANopen communication, set H0E.10 to 2.

H0E.11 **CAN baud rate**

Hexadecimal:	200E-0Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	5	Change:	At stop

Value Range:
0: 20 kbps
1: 50 kbps
2: 100 kbps
3: 125 kbps
4: 250 kbps
5: 500 kbps
6: 1 Mbps
1 Mbps - non-standard

Description
It sets the CAN (CANlink or CANopen) communication rate between the servo drive and the host controller. The communication rate set in the servo drive must be the same as that in the host controller. Otherwise, communication will fail. If H0E.11 is set to 6, the baud rate is 1 Mbps. 80% sampling points are used to match most PLCs with a 1M standard baud rate.
If H0E.11 is set to 7, the baud rate is 1 Mbps. 70% sampling points are used to match most PLCs with a 1M non-standard (deviated) baud rate. Reducing sampling points can also reduce error frames.

H0E.12 **Excessive IP position command increment count**

Hexadecimal:	200E-0Dh	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	30	Data Type:	UInt16
Default:	20	Change:	Immediately

Value Range:
1 to 30

Description
-

H0E.13 **CANopen sync period error limit**

Hexadecimal:	200E-0Eh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: 1/4
1: 1/2
2: 3/4
3: 1
4: 2
5: Disabled

Description

SYNC signal error threshold in the IP mode.

H0E.14 **CANopen communication state**

Hexadecimal:	200E-0Fh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	9	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 9

Description

-

H0E.17 **Get the count of received NMT frames with incorrect length**

Hexadecimal:	200E-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0E.18 **Get the count of received NMT frames with incorrect command**

Hexadecimal:	200E-13h	Effective Time:	Real time
Min.:	0	Unit:	-

Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0E.19 Get received heartbeat frames of wrong length

Hexadecimal:	200E-14h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

-

H0E.80 Modbus baud rate

Hexadecimal:	200E-51h	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**

Hexadecimal:	200E-52h	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**

Hexadecimal:	200E-53h	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**

Hexadecimal:	200E-54h	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**

Hexadecimal:	200E-55h	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 **Modbus version**

Hexadecimal:	200E-5Bh	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

-

H0E.91 **CANopen version number**

Hexadecimal:	200E-5Ch	Effective Time:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

-

H0E.92 **CANlink version**

Hexadecimal:	200E-5Dh	Effective Time:	-

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

Value Range:
0.00 to 655.35
Description
-

H0E.97 **Communication monitoring parameter 1**

Hexadecimal:	200E-62h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 to 65535
Description
-

H0E.98 **Communication monitoring parameter 2**

Hexadecimal:	200E-63h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 to 65535
Description
-

4.15 H0F Fully Closed-Loop

H0F.00 **Encoder feedback mode**

Hexadecimal:	200F-01h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Internal encoder feedback
1: External encoder feedback
2: Inner/Outer loop switchover

Description

Defines the encoder feedback signal source in fully closed-loop control.
0: Internal encoder feedback. The position feedback signals come from the motor encoder.
1: External encoder feedback The position feedback signals come from the fully closed-loop external encoder and electronic gear ratio 1 is used.
2: Inner/Outer loop switchover: The DI assigned with FunIN.24 (GEAR_SEL, electronic gear ratio switchover) is switch between inner and outer position closed loops.
DI function: disabled, internal encoder feedback, with electronic gear ratio 1 used
Enabled, external encoder feedback, with electronic gear ratio 2 used

Note

To switch between inner and outer loops, you need to set H0F.00 to 2, rather than changing it to 0 or 1 in realtime.

H0F.01 **External encoder usage mode**

Hexadecimal:	200F-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Standard operating direction
1: Reverse operating direction

Description

Defines the feedback pulse counting direction of internal and external encoders when the motor rotates in the fully closed-loop mode.
0: Standard operating direction: The pulse feedback counter of the internal encoder (H0F.18) is in the same direction as that of the external encoder (H0F.20) during rotation of the motor.
1: Reverse operating direction: The pulse feedback counter of the internal encoder (H0F.18) is in the opposite direction as that of the external encoder (H0F.20) during rotation of the motor.

H0F.02 **External encoder absolute value**

Hexadecimal:	200F-03h	Effective Time:	Upon the next power-on

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

Value Range:

0: Incremental

1: Absolute linear

Description

-

H0F.03 External encoder feedback type

Hexadecimal:	200F-04h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	0	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Quadrature pulse

Description

-

H0F.04 External encoder pulses per revolution

Hexadecimal:	200F-05h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	10000	Change:	At stop

Value Range:

0 to 2147483647

Description

Defines the pulses fed back by the external encoder per revolution of the motor. It defines the quantity relation between feedback pulses from the external encoder and those from the internal encoder.

Calculate the value of this parameter through analyzing mechanical parameters. When rigid connection is applied between the motor and the external encoder (scale), you can also set this parameter using the following method:

1. Manually rotate the motor and observe H0F.18 (Feedback pulse counter of internal encoder) in the meantime. After ensuring that the motor has rotated for a full turn (H0F.18 = Motor resolution), calculate the change of H0F.20 (Feedback pulse counter of external encoder) and use the absolute value of the change as the value of H0F.04.
2. Assume values of H0F.18 and H0F.20 are X1 and Y1 before the motor rotates and X2 and Y2 after the motor rotates, then the following formula applies:
H0F.04 = Motor resolution x (Y2 - Y1)/(X2 - X1) The calculated result must be positive; if not, perform step 1 again.
For non-rigid connection, an error may exist in the calculation result.
Note:
Ensure H0F.04 is set properly. Otherwise, EB02.0 (Position deviation too large in fully closed loop) may occur after the drive operates.

H0F.08 Excessive deviation threshold in compound control mode

Hexadecimal:	200F-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1000	Change:	Immediately

Value Range:
0 to 2147483647
Description
Defines the position deviation threshold at which the servo drive reports EB02.0 (Position deviation too large in fully closed-loop mode).
When H0F.08 is set to 0, the drive does not detect EB02.0 and always clears the fully closed-loop position deviation.

H0F.10 Clear deviation in compound control mode

Hexadecimal:	200F-0Bh	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	100	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
0rpm–100rpm
Description
Defines the number of revolutions rotated by the motor per a clear of the fully closed-loop position deviation during operation. The number of revolutions is reflected by H0F.18 (Feedback pulse counter of internal encoder). The number of motor revolutions will not be cleared when the drive is not in the oeprational state.

H0F.13 Compound vibration suppression filter time

Hexadecimal:	200F-0Eh	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 time constant for compound vibration suppression in fully closed-loop control when external encoder feedback (H0F.00 = 1 or 2) is used.

Increase the setpoint gradually and check the response change.

When the stiffness of the transmission mechanism between fully closed loop and internal loop is insufficient, set H0F.13 properly to improve system stability, which is to generate the effect of internal loop temporarily and form a fully closed loop again after the system is stabilized. When the stiffness is sufficient, there is no need to adjust this parameter.

H0F.16 Pulse deviation display in compound control mode

Hexadecimal:	200F-11h	Effective Time:	-
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Used to count and display the position deviation absolute value in fully closed loop control.

Pulse deviation in compound control = Absolute position feedback of external encoder - Absolute position feedback conversion value of internal encoder

H0F.18 Internal position pulse feedback display

Hexadecimal:	200F-13h	Effective Time:	-
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Used to count and display the number of feedback pulses of the internal encoder (after being divided or multiplied by electronic gear ratio, in internal encoder unit).

H0F.20 External position pulse feedback display

Hexadecimal:	200F-15h	Effective Time:	-
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Used to count and display the number of feedback pulses of the external encoder (after being divided or multiplied by electronic gear ratio, in external encoder unit).

H0F.22 External encoder phase Z detection invalid (quadrature pulse feedback)

Hexadecimal:	200F-17h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Detected

1: Not detected

Description

-

H0F.23 BISS absolute homing offset

Hexadecimal:	200F-18h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648–2147483647

Description

-

H0F.25 **Set the source of touch probe Z signal in fully closed-loop mode.**

Hexadecimal:	200F-1Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Motor Z signal

1: External feedback Z signal

Description

-

H0F.26 **BISS absolute feedback offset**

Hexadecimal:	200F-1Bh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648–2147483647

Description

-

H0F.28 **Index value of BISS communication warning**

Hexadecimal:	200F-1Dh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

-

H0F.29 **CRC of BISS fully closed-loop feedback**

Hexadecimal:	200F-1Eh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

0: Positive
1: Negative
Description
-

H0F.30 Valid bit of BISS communication position feedback

Hexadecimal:	200F-1Fh	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	29	Change:	At stop

Value Range:
0–127
Description
-

H0F.31 Valid bit of BISS communication warning index

Hexadecimal:	200F-20h	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:
0–31
Description
-

H0F.40 Inovance fully closed-loop encoder communication error register

Hexadecimal:	200F-29h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0–65535
Description
-

H0F.41 Inovance fully closed-loop encoder version

Hexadecimal:	200F-2Ah	Effective Time:	-

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

Value Range:
0.0–6553.5
Description
-

H0F.42 Inovance fully closed-loop encoder resolution

Hexadecimal:	200F-2Bh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:
0–4294967295
Description
-

H0F.45 Positioning completed/Position deviation threshold in fully closed-loop mode

Hexadecimal:	200F-2Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Threshold scaled to outer loop unit
1: Same threshold used for inner and outer loops
Description
0: H05.21 or H0A.10 or 6067 or 6065 (scaled to outer loop unit)
1: Same threshold used for inner and outer loops

H0F.46 Fully closed-loop speed feedback selection

Hexadecimal:	200F-2Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Internal encoder feedback
1: External encoder feedback

Description

4.16 H11 Multi-position

H11.00 **Multi-position operation mode**

Hexadecimal:	2011-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Single run (number of displacements selected in H11.01)

1: Cyclic operation (number of displacement selected in H11.01)

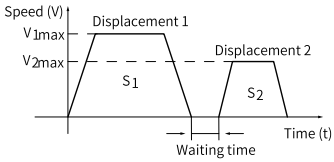
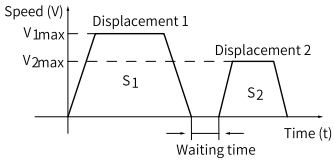
2: DI-based operation (selected by DI)

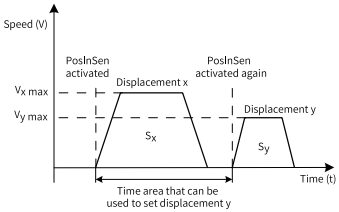
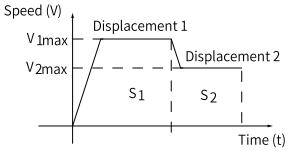
3: Sequential operation

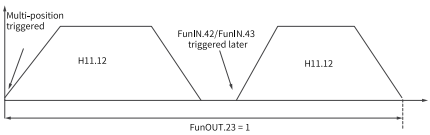
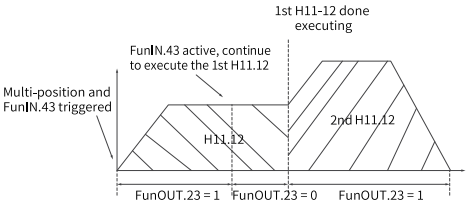
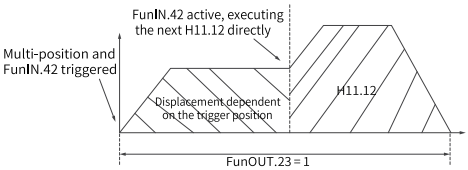
5: Axis-controlled continuous operation

Description

Defines the multi-position operation mode when the main position reference source is multi-position references (H05.00 = 2) in the position control mode.

Set point	Operation Mode	Remarks	Operation Curve
0	Individual operation	The drive stops after one cycle of operation. The drive automatically switches to the next speed. You can set the interval time between displacements. The multi-position reference is level-triggered.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2 S_1 , S_2 : displacement 1 and displacement 2
1	Cyclic operation	The starting displacement after the first cycle is displacement 1. The drive automatically switches to the next speed. You can set the interval time between displacements. The multi-position reference is level-triggered.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2 S_1 , S_2 : displacement 1 and displacement 2

Set point	Operation Mode	Remarks	Operation Curve
2	DI-based operation	The drive continues operating when the displacement No. is updated. The speed No. is determined by the DI logic. The interval time between displacements is determined by the command delay of the host controller. The multi-position reference is edge-triggered.	 V_{xmax} , V_{ymax} : maximum operating speeds in displacement x and displacement y S_x , S_y : displacement x and displacement y
3	Sequential operation	The drive stops after one cycle of operation. The starting displacement after the first cycle is defined by H11.05. The drive automatically switches to the next speed. There is no interval time between displacements. The multi-position reference is level-triggered.	 V_{1max} , V_{2max} : maximum operating speeds in displacement 1 and displacement 2 S_1 , S_2 : displacement 1 and displacement 2

Set point	Operation Mode	Remarks	Operation Curve
5	Axis-controlled continuous operation	The drives executes one displacement only. The individual operation mode, sequential operation mode, and interrupted operation mode are included. The PosInSen (multi-position reference enable) signal is level-triggered.	• Individual operation  The PosInSen (multi-position reference enable) signal is triggered only once (FunIN.43/42 triggered later). The drive stops after executing the distance defined by H11.12. • Sequential operation  The PosInSen (multi-position reference enable) signal is triggered only once. Write H11.12 again and activate FunIN.43 when the distance defined by the first H11.12 is still in progress.After receiving the new distance (or speed), which is the second H11.12, the drive continues executing the first H11.12 until the distance defined by the first H11.12 is done. Then it starts to execute the second H11.12 directly. The travel distance therefore is the sum of the first H11.12 and the second H11.12. • Interrupted operation  The PosInSen (Multi-position reference enable) signal is triggered only once. Write H11.12 (such as 1000000) again and activate FunIN.42 when the first H11.12 (such as 9000000) is still in progress. After receiving the new distance (or speed), which is the second H11.12, the drive stops executing the first H11.12 and turns to executing the second H11.12.

To use the multi-position function, assign FunIN.28 (PosInSen, multi-position reference enable) to a DI first. See "Group H03: Terminal input parameters" for the setting mode.

The positioning completed (COIN) signal is activated each time upon completion of a displacement. To determine whether a certain displacement is done executing, use FunOUT.5 (COIN, positioning completed). See "Group H04: Terminal output parameters" for details.

Ensure the S-ON signal is active during operation of each displacement. Otherwise, the drive stops immediately as defined by H02.05 (Stop mode at S-ON OFF) and the positioning completed (COIN) signal in inactive. In modes other than DI-based operation, if the S-ON signal is active but multi-position is disabled during operation of a certain displacement, the drive abandons the unsent displacement reference and stops, with the positioning completed (COIN) signal being active. If the multi-position function is enabled again, the displacement to be executed is defined by H11.02.

H11.01 Number of displacement references in multi-position mode

Hexadecimal:	2011-02h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 16

Description

Defines the total number of displacement references in the multi-position mode. You can set different displacements, operating speeds, and acceleration/deceleration time for each displacement.

H11.00 ≠ 2: Displacements are switched automatically in a sequence from 1, 2... H11.01.

H11.00 = 2: Assign four DIs (hardware DI or VDI) with DI functions 6 to 9 (FunIN.6: CMD1 to FunIN.9: CMD4) and you can switch between different speeds by controlling the DI logic through the host controller. The segment No. is a 4-bit binary value. Bit0 to bit 3 correspond to CMD1 to CMD4.

The displacement No. is a 4-bit binary value. The relationship between the displacement numbers and CMD1...CMD4 is shown in the following table.

FunIN.9	FunIN.8	FunIN.7	FunIN.6	Segment No.
CMD4	CMD3	CMD2	CMD1	
0	0	0	0	1
0	0	0	1	2
...				
1	1	1	1	16

H11.02 Starting displacement No. after pause

Hexadecimal:	2011-03h	Effective Time:	Real time

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

Value Range:

0: Continue to execute the unexecuted displacements

1: Start from displacement 1

Description

Defines the starting displacement No. when the multi-position operation recovers from a pause.

Pause:

1. The servo drive switches to another control mode or the interrupt positioning function is enabled during multi-position operation.

2. The internal multi-position enable signal (FunIN.28:PosInSen) changes from "active" to "inactive".

0: Continue to execute the unexecuted displacements: For example, if H11.01 is set to 16 and the drive pauses at displacement 2, after the drive recovers from the pause, it will start from displacement 3.

1: Start from displacement 1: For example, if H11.01 is set to 16 and the drive pauses at displacement 2, after the drive recovers from the pause, it will start from displacement 1.

H11.03 Interval time unit

Hexadecimal:	2011-04h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: ms

1: s

Description

Defines the unit of acceleration/deceleration time and the interval time during multi-position operation.

Acceleration/Deceleration time: time for the motor to change from 0 rpm to 1000 rpm at a constant speed.

Interval time: interval time that starts from the end of the last reference to the beginning of the next reference

H11.04 Displacement reference type

Hexadecimal:	2011-05h	Effective Time:	Real time
Min.:	0	Unit:	-

Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Relative displacement reference

1: Absolute displacement reference

Description

Relative displacement: position increment of the target position relative to the current motor position

Absolute displacement: position increment of the target position relative to the motor home.

H11.05 Starting displacement No. in sequential operation

Hexadecimal:	2011-06h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 16

Description

Defines whether to perform cyclic operation and the starting displacement No. after the first cycle of operation in the sequential operation mode (H11.00 = 3).

0: The drive executes the displacements defined by H11.01 only once and then stops. The motor is in the locked state.

1–16: The drive operates cyclically, with the starting displacement No. defined by H11.05 after the first cycle of operation. The value of H11.05 should be lower than or equal to H11.01.

H11.09 Deceleration upon axis control OFF

Hexadecimal:	2011-0Ah	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	65535	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

-

H11.10 Starting speed of displacement 1

Hexadecimal:	2011-0Bh	Effective Time:	Real time

Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 rpm to 10000 rpm

Description

-

H11.11 Stop speed of displacement 1

Hexadecimal:	2011-0Ch	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 rpm to 10000 rpm

Description

-

H11.12 Displacement 1

Hexadecimal:	2011-0Dh	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

Defines displacement 1 (reference unit) in multi-position operation.

H11.14 Max. speed of displacement 1

Hexadecimal:	2011-0Fh	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1 rpm to 10000 rpm

Description

Defines the maximum speed of displacement 1 in multi-position operation. The maximum speed is the average operating speed when the motor is not in the acceleration/deceleration process. If H11.12 is set to a too low value, the actual motor speed will be lower than H11.14.

H11.15 Acc/Dec time of displacement 1

Hexadecimal:	2011-10h	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 time for the motor to change from 0 rpm 1000 rpm at a constant speed during displacement 1.

Actual time needed for accelerating to H11.14 (Max. speed of displacement 1):

$$t = \frac{(H11.14) \times (H11.15)}{1000}$$

Note: The rigidity must be good, and the speed loop can follow the position command.

H11.16 Interval time after displacement 1

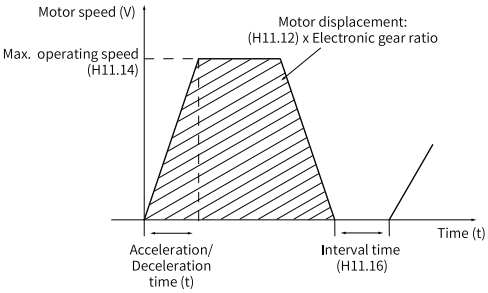
Hexadecimal:	2011-11h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

Defines the interval time that starts from the end of displacement 1 to the beginning of the next displacement.



H11.17 **Displacement 2**

Hexadecimal:	2011-12h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.19 **Max. speed of displacement 2**

Hexadecimal:	2011-14h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1 rpm to 10000 rpm

Description

-

H11.20 **Acc/Dec time of displacement 2**

Hexadecimal:	2011-15h	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

-

H11.21 Interval time after displacement 2

Hexadecimal:	2011-16h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.22 Displacement 3

Hexadecimal:	2011-17h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.24 Max. speed of displacement 3

Hexadecimal:	2011-19h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.25 **Acc/Dec time of displacement 3**

Hexadecimal:	2011-1Ah	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

-

H11.26 **Interval time after displacement 3**

Hexadecimal:	2011-1Bh	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.27 **Displacement 4**

Hexadecimal:	2011-1Ch	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.29 **Max. speed of displacement 4**

Hexadecimal:	2011-1Eh	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.30 **Acc/Dec time of displacement 4**

Hexadecimal:	2011-1Fh	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

-

H11.31 **Interval time after displacement 4**

Hexadecimal:	2011-20h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.32 **Displacement 5**

Hexadecimal:	2011-21h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.34 **Max. speed of displacement 5**

Hexadecimal:	2011-23h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16

Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.35 Acc/Dec time of displacement 5

Hexadecimal:	2011-24h	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

-

H11.36 Interval time after displacement 5

Hexadecimal:	2011-25h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.37 Displacement 6

Hexadecimal:	2011-26h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.39 **Max. speed of displacement 6**

Hexadecimal:	2011-28h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.40 **Acc/Dec time of displacement 6**

Hexadecimal:	2011-29h	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

-

H11.41 **Interval time after displacement 6**

Hexadecimal:	2011-2Ah	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.42 **Displacement 7**

Hexadecimal:	2011-2Bh	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.44 **Max. speed of displacement 7**

Hexadecimal:	2011-2Dh	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.45 **Acc/Dec time of displacement 7**

Hexadecimal:	2011-2Eh	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

-

H11.46 **Interval time after displacement 7**

Hexadecimal:	2011-2Fh	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.47 **Displacement 8**

Hexadecimal:	2011-30h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32

Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.49 Max. speed of displacement 8

Hexadecimal:	2011-32h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.50 Acc/Dec time of displacement 8

Hexadecimal:	2011-33h	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

-

H11.51 Interval time after displacement 8

Hexadecimal:	2011-34h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.52 **Displacement 9**

Hexadecimal:	2011-35h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:
-1073741824 to 1073741824
Description
-

H11.54 **Max. speed of displacement 9**

Hexadecimal:	2011-37h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:
1rpm–10000rpm
Description
-

H11.55 **Acc/Dec time of displacement 9**

Hexadecimal:	2011-38h	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
-

H11.56 **Interval time after displacement 9**

Hexadecimal:	2011-39h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:
0 ms(s) to 10000 ms(s)

Description

-

H11.57 **Displacement 10**

Hexadecimal:	2011-3Ah	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.59 **Max. speed of displacement 10**

Hexadecimal:	2011-3Ch	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.60 **Acc/Dec time of displacement 10**

Hexadecimal:	2011-3Dh	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

-

H11.61 **Interval time after displacement 10**

Hexadecimal:	2011-3Eh	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16

Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.62 Displacement 11

Hexadecimal:	2011-3Fh	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.64 Max. speed of displacement 11

Hexadecimal:	2011-41h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.65 Acc/Dec time of displacement 11

Hexadecimal:	2011-42h	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

-

H11.66 Interval time after displacement 11

Hexadecimal:	2011-43h	Effective Time:	Real time

Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.67 **Displacement 12**

Hexadecimal:	2011-44h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.69 **Max. speed of displacement 12**

Hexadecimal:	2011-46h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.70 **Acc/Dec time of displacement 12**

Hexadecimal:	2011-47h	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

-

H11.71 **Interval time after displacement 12**

Hexadecimal:	2011-48h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:
0 ms(s) to 10000 ms(s)
Description
-

H11.72 **Displacement 13**

Hexadecimal:	2011-49h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:
-1073741824 to 1073741824
Description
-

H11.74 **Max. speed of displacement 13**

Hexadecimal:	2011-4Bh	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:
1rpm–10000rpm
Description
-

H11.75 **Acc/Dec time of displacement 13**

Hexadecimal:	2011-4Ch	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

-

H11.76 **Interval time after displacement 13**

Hexadecimal:	2011-4Dh	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.77 **Displacement 14**

Hexadecimal:	2011-4Eh	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.79 **Max. speed of displacement 14**

Hexadecimal:	2011-50h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.80 **Acc/Dec time of displacement 14**

Hexadecimal:	2011-51h	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

-

H11.81 Interval time after displacement 14

Hexadecimal:	2011-52h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.82 Displacement 15

Hexadecimal:	2011-53h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.84 Max. speed of displacement 15

Hexadecimal:	2011-55h	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.85 **Acc/Dec time of displacement 15**

Hexadecimal:	2011-56h	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

-

H11.86 **Interval time after displacement 15**

Hexadecimal:	2011-57h	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

H11.87 **Displacement 16**

Hexadecimal:	2011-58h	Effective Time:	Real time
Min.:	-1073741824	Unit:	Reference unit
Max.:	1073741824	Data Type:	Int32
Default:	10000	Change:	Immediately

Value Range:

-1073741824 to 1073741824

Description

-

H11.89 **Max. speed of displacement 16**

Hexadecimal:	2011-5Ah	Effective Time:	Real time
Min.:	1	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:

1rpm–10000rpm

Description

-

H11.90 **Acc/Dec time of displacement 16**

Hexadecimal:	2011-5Bh	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

-

H11.91 **Interval time after displacement 16**

Hexadecimal:	2011-5Ch	Effective Time:	Real time
Min.:	0	Unit:	ms (s)
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0 ms(s) to 10000 ms(s)

Description

-

4.17 H12 Multi-Speed

H12.00 **Multi-speed operation mode**

Hexadecimal:	2012-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

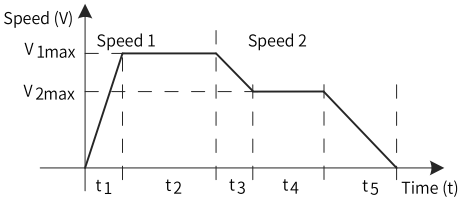
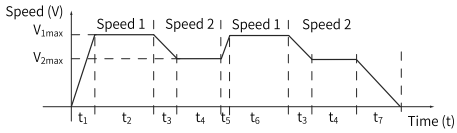
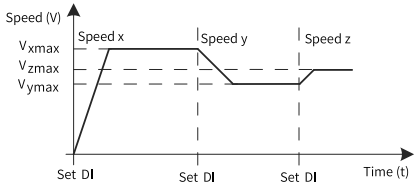
0: Stop after running for one cycle (number of speeds defined by H12.01)

1: Cyclic operation (number of speeds defined by H12.01)

2: DI-based operation

Description

Defines the multi-speed operation mode when the speed reference source is multi-speed reference (H06.01 = 5, H06.02 = 1/2/3) in the speed control mode. The S-ON signal must be active during operation of each speed. Otherwise, the drive stops immediately as defined by H02.05 (Stop mode at S-ON OFF). The speed reach signal (FunOUT.19：V-Arr) is activated each time when a speed reference value is reached.

Set point	Operation Mode	Remarks	Operation Curve
0	Individual operation	The drive stops after one cycle of operation. The drive switches to the next displacement automatically.	 V 1max , V 2max : reference values of speed 1 and speed 2 t 1 : actual acceleration/deceleration time of speed 1 t 3 , t 5 : acceleration/deceleration time of speed 2
1	Cyclic operation	The drive starts from speed 1 after each cycle of operation. The drive automatically switches to the next speed. The cyclic operation state remains active as long as the S-ON signal is active.	 V 1max , V 2max : maximum operating speeds in displacement 1 and displacement 2
2	External DI signal	The drive operates continuously as long as the S-ON signal is active. The speed No. is determined by the DI logic. The operating time of each speed is determined only by the interval time of speed switchover. The speed reference direction can be switched through FunIN.5 (DIR-SEL).	 x, y: speed No. (The relationship between the speed No. and the DI logic is described below.) V x , V y: speed references for speeds x and y The speed No. determined by DI does not change, which means the speed reference operates continuously regardless of the reference operating time.

H12.01 **Number of speed references in multi-speed mode**

Hexadecimal:	2012-02h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	16	Change:	At stop

Value Range:

1 to 16

Description

Defines the total number of speed references in the multi-speed mode. Different speed references, operating time, and acceleration/deceleration time (four groups optional) can be set for each speed.

H12.00 ≠ 2: Speeds are switched automatically in a sequence from 1, 2... H12.01.

H12.00 = 2: Assign four DIs (hardware DI or VDI) with DI functions 6 to 9 (FunIN.6: CMD1 to FunIN.9: CMD4) and control the DI logic through the host controller to switch between different speeds. The speed No. is a 4-bit binary value. bit0... bit3 correspond to CMD1...CMD4, as shown below.

FunIN.9	FunIN.8	FunIN.7	FunIN.6	Segment No.
CMD4	CMD3	CMD2	CMD1	
0	0	0	0	1
0	0	0	1	2
...				
1	1	1	1	16

The value of CMD(n) is 1 upon active DI logic and 0 upon inactive DI logic.

H12.02 **Operating time unit**

Hexadecimal:	2012-03h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: s

1: min

Description

Defines the time unit of multi-speed operation.

0: s

1: min

H12.03 **Acceleration time 1**

Hexadecimal:	2012-04h	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

Four groups of acceleration/deceleration time can be set for each speed reference.

Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.04 **Deceleration time 1**

Hexadecimal:	2012-05h	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

Four groups of acceleration/deceleration time can be set for each speed reference.

Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.05 **Acceleration time 2**

Hexadecimal:	2012-06h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.

Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.06 **Deceleration time 2**

Hexadecimal:	2012-07h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.

Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.07 **Acceleration time 3**

Hexadecimal:	2012-08h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.

Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.08 **Deceleration time 3**

Hexadecimal:	2012-09h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.

Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.09 **Acceleration time 4**

Hexadecimal:	2012-0Ah	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	150	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.

Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H12.10 **Deceleration time 4**

Hexadecimal:	2012-0Bh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	150	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Four groups of acceleration/deceleration time can be set for each speed reference.

Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

H12.20 **Speed reference 1**

Hexadecimal:	2012-15h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.21 **Operating time of speed 1**

Hexadecimal:	2012-16h	Effective Time:	Real time

Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:

0.0s(m) to 6553.5s(m)

Description

Defines the operating time of speed 1.

The operating time is the sum of the speed variation time from previous speed reference to present speed reference plus the average operating time of present speed reference.

If the operating time is set to 0, the drive skips this speed reference automatically.

As long as H12.00 (Multi-speed operation mode) is set to 2 (DI-based operation) and the speed No. determined by the external DI does not change, the drive continues operating at the speed defined by this speed reference, not affected by the reference operating time.

H12.22 1st speed rise/drop and curve smoothing parameter time

Hexadeci-mal:	2012-17h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:

bit0-bit7: Speed rise and drop time

0: Zero acc and dec time

1: Acc and dec time 1

2: Acc and dec time 2

3: Acc and dec time 3

4: Acc and dec time 4

bit8-bit15: S curve smoothing parameter

1: Smoothing parameter 1

2: Smoothing parameter 2

3: Smoothing parameter 3

4: Smoothing parameter 4

5: Smoothing parameter 5

6: Smoothing parameter 6

7: Smoothing parameter 7

8: Smoothing parameter 8

Description

Table 4–5 Selects the acceleration/deceleration time of speed 1.

Setpoint	Meaning	Description
0	Zero acceleration/ deceleration time	Acceleration time: 0 Deceleration time: 0
1	Acceleration/ Deceleration time 1	Acceleration time: H12.03 Deceleration time: H12.04
2	Acceleration/ Deceleration time 2	Acceleration time: H12.05 Deceleration time: H12.06
3	Acceleration/ Deceleration time 3	Acceleration time: H12.07 Deceleration time: H12.08
4	Acceleration/ Deceleration time 4	Acceleration time: H12.09 Deceleration time: H12.10

Table 4–6 S curve smoothing parameter

Setpoint	Meaning	Description
1	Smoothing parameter 1	Increasing acceleration time at acceleration segment: H06.51 Decreasing acceleration time at acceleration segment: H06.52 Decreasing deceleration time at deceleration segment: H06.53 Decreasing acceleration time at acceleration segment: H06.54
2	Smoothing parameter 2	Increasing acceleration time at acceleration segment: H06.55 Decreasing acceleration time at acceleration segment: H06.56 Decreasing deceleration time at deceleration segment: H06.57 Decreasing acceleration time at acceleration segment: H06.58
3	Smoothing parameter 3	Increasing acceleration time at acceleration segment: H06.59 Decreasing acceleration time at acceleration segment: H06.60 Decreasing deceleration time at deceleration segment: H06.61 Decreasing acceleration time at acceleration segment: H06.62

Setpoint	Meaning	Description
4	Smoothing parameter 4	Increasing acceleration time at acceleration segment: H06.63 Decreasing acceleration time at acceleration segment: H06.64 Decreasing deceleration time at deceleration segment: H06.65 Decreasing acceleration time at acceleration segment: H06.66
5	Smoothing parameter 5	Increasing acceleration time at acceleration segment: H06.67 Decreasing acceleration time at acceleration segment: H06.68 Decreasing deceleration time at deceleration segment: H06.69 Decreasing acceleration time at acceleration segment: H06.70
6	Smoothing parameter 6	Increasing acceleration time at acceleration segment: H06.71 Decreasing acceleration time at acceleration segment: H06.72 Decreasing deceleration time at deceleration segment: H06.73 Decreasing acceleration time at acceleration segment: H06.74
7	Smoothing parameter 7	Increasing acceleration time at acceleration segment: H06.75 Decreasing acceleration time at acceleration segment: H06.76 Decreasing deceleration time at deceleration segment: H06.77 Decreasing acceleration time at acceleration segment: H06.78
8	Smoothing parameter 8	Increasing acceleration time at acceleration segment: H06.79 Decreasing acceleration time at acceleration segment: H06.80 Decreasing deceleration time at deceleration segment: H06.81 Decreasing acceleration time at acceleration segment: H06.82

H12.23 **Reference 2**

Hexadecimal:	2012-18h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm

Max.:	10000	Data Type:	Int16
Default:	100	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.24 Operating time of speed 2

Hexadecimal:	2012-19h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.25 2nd speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-1Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.26 Reference 3

Hexadecimal:	2012-1Bh	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	300	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.27 **Operating time of speed 3**

Hexadecimal:	2012-1Ch	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.28 **3nd speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-1Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.29 **Reference 4**

Hexadecimal:	2012-1Eh	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	500	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.30 **Operating time of speed 4**

Hexadecimal:	2012-1Fh	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)

Description

-

H12.31 4th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-20h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:

See H12.22.

Description

Same as H12.22.

H12.32 Reference 5

Hexadecimal:	2012-21h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	700	Change:	Immediately

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.33 Operating time of speed 5

Hexadecimal:	2012-22h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.34 5th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-23h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.35 Reference 6

Hexadecimal:	2012-24h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	900	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.36 Operating time of speed 6

Hexadecimal:	2012-25h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.37 6th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-26h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.38 Reference 7

Hexadecimal:	2012-27h	Effective Time:	Real time

Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	600	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.39 Operating time of speed 7

Hexadecimal:	2012-28h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.40 7th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-29h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.41 Reference 8

Hexadecimal:	2012-2Ah	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	300	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.42 **Operating time of speed 8**

Hexadecimal:	2012-2Bh	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.43 **8th speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-2Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.44 **Reference 9**

Hexadecimal:	2012-2Dh	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	100	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.45 **Operating time of speed 9**

Hexadecimal:	2012-2Eh	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)

Description

-

H12.46 **9th speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-2Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:

See H12.22.

Description

Same as H12.22.

H12.47 **Reference 10**

Hexadecimal:	2012-30h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-100	Change:	Immediately

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.48 **Operating time of speed 10**

Hexadecimal:	2012-31h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.49 **10th speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-32h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.50 Reference 11

Hexadecimal:	2012-33h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-300	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.51 Operating time of speed 11

Hexadecimal:	2012-34h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.52 11th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-35h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.53 Reference 12

Hexadecimal:	2012-36h	Effective Time:	Real time

Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-500	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.54 Operating time of speed 12

Hexadecimal:	2012-37h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.55 12th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-38h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.56 Reference 13

Hexadecimal:	2012-39h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-700	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.57 **Operating time of speed 13**

Hexadecimal:	2012-3Ah	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.58 **13th speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-3Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.59 **Reference 14**

Hexadecimal:	2012-3Ch	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-900	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.60 **Operating time of speed 14**

Hexadecimal:	2012-3Dh	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)

Description

-

H12.61 **14th speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-3Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:

See H12.22.

Description

Same as H12.22.

H12.62 **Reference 15**

Hexadecimal:	2012-3Fh	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-600	Change:	Immediately

Value Range:

–10000 RPM to +10000 RPM

Description

-

H12.63 **Operating time of speed 15**

Hexadecimal:	2012-40h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:

0.0s(m) to 6553.5s(m)

Description

-

H12.64 **15th speed rise/drop time and curve smoothing parameter time**

Hexadecimal:	2012-41h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

H12.65 Reference 16

Hexadecimal:	2012-42h	Effective Time:	Real time
Min.:	-10000	Unit:	rpm
Max.:	10000	Data Type:	Int16
Default:	-300	Change:	Immediately

Value Range:
–10000 RPM to +10000 RPM
Description
-

H12.66 Operating time of speed 16

Hexadecimal:	2012-43h	Effective Time:	Real time
Min.:	0.0	Unit:	s (m)
Max.:	6553.5	Data Type:	UInt16
Default:	5.0	Change:	Immediately

Value Range:
0.0s(m) to 6553.5s(m)
Description
-

H12.67 16th speed rise/drop time and curve smoothing parameter time

Hexadecimal:	2012-44h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	256	Change:	Immediately

Value Range:
See H12.22.
Description
Same as H12.22.

4.18 H17 Virtual DI/DO

H17.90 **Communication VDI enable**

Hexadecimal:	2017-5Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

To use the VDI function:

1. Set H17.90 to enable VDI.
2. Set the default level after power-on through H17.91.
3. Set the DI function of the VDI terminal through parameters in group H17.
4. Set VDI output through H31.00.

H17.91 **VDI default value upon power-on**

Hexadecimal:	2017-5Ch	Effective Time:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: No default

1: VDI1 default value

2: VDI2 default value

4: VDI3 default value

8: VDI4 default value

16: VDI5 default value

32: VDI6 default value

64: VDI7 default value

128: VDI8 default value

256: VDI9 default value

512: VDI10 default value

1024: VDI11 default value

2048: VDI12 default value

4096: VDI13 default value

8092: VDI14 default value

16384: VDI15 default value

32768: VDI16 default value

Description

Configures the initial value of VDI upon power-on.

Bit 0 corresponds to VDI1.

Bit 1 corresponds to VDI2.

…

bit15 corresponds to VDI16.

H17.00 VDI1 function selection

Hexadecimal:	2017-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: No assignment
1: S-ON
2: Warning reset signal
3: Gain switchover switch
4: Switchover between main and auxiliary commands
5: Multi-reference direction
6: Multi-reference switchover CMD1
7: Multi-reference switchover CMD2
8: Multi-reference switchover CMD3
9: Multi-reference switchover CMD4
10: Mode switchover M1-SEL
11: Mode switchover M2-SEL
12: Zero clamp enable signal
13: Position reference inhibited
14: Positive limit switch
15: Reverse limit switch
16: Positive external torque limit
17: Negative external torque limit
18: Forward jog
19: Reverse jog
20: Step enable
21: Hand wheel override signal 1
22: Hand wheel override signal 2
23: Hand wheel enable signal
24: Electronic gear ratio selection
25: Torque reference direction
26: Speed reference direction
27: Position reference direction
28: Multi-position reference enable
29: Interrupt positioning canceled
31: Home switch
32: Homing enable
33: Interrupt positioning inhibited
34: Emergency stop
35: Clear position deviation
36: Internal speed limit source
37: Pulse reference inhibited
38: Touch probe 1
39: Touch probe 2
41: Current position as home
42: Axis control command executed immediately
43: Axis control command not executed immediately
44: Positioning and command completed signal clear
45: Interrupt positioning enable
46: Process segment enable
47: Process segment command switchover 1

Description

-

H17.01 **VDI1 logic level**

Hexadecimal:	2017-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.02 **VDI2 function**

Hexadecimal:	2017-03h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.03 **VDI2 logic level selection**

Hexadecimal:	2017-04h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.04 **VDI3 function**

Hexadecimal:	2017-05h	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.05 VDI3 logic level selection

Hexadecimal:	2017-06h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.06 VDI4 function

Hexadecimal:	2017-07h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.07 VDI4 logic level selection

Hexadecimal:	2017-08h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.08 **VDI5 function selection**

Hexadecimal:	2017-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.09 **VDI5 logic level selection**

Hexadecimal:	2017-0Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.10 **VDI6 function selection**

Hexadecimal:	2017-0Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.11 **VDI6 logic level selection**

Hexadecimal:	2017-0Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1
Description
-

H17.12 VDI7 function selection

Hexadecimal:	2017-0Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H17.00.
Description
-

H17.13 VDI7 logic level selection

Hexadecimal:	2017-0Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Active when the written value is 1
1: Active when the written value changes from 0 to 1
Description
-

H17.14 VDI8 function selection

Hexadecimal:	2017-0Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H17.00.
Description
-

H17.15 VDI8 logic level selection

Hexadecimal:	2017-10h	Effective Time:	Real time

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

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.16 VDI9 function selection

Hexadecimal:	2017-11h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.17 VDI9 logic level selection

Hexadecimal:	2017-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.18 VDI10 function selection

Hexadecimal:	2017-13h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.19 VDI10 logic level selection

Hexadecimal:	2017-14h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.20 VDI11 function selection

Hexadecimal:	2017-15h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.21 VDI11 logic level selection

Hexadecimal:	2017-16h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.22 VDI12 function selection

Hexadecimal:	2017-17h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.23 VDI12 logic level selection

Hexadecimal:	2017-18h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.24 VDI13 function selection

Hexadecimal:	2017-19h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.25 VDI13 logic level selection

Hexadecimal:	2017-1Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.26 VDI14 function selection

Hexadecimal:	2017-1Bh	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.27 VDI14 logic level selection

Hexadecimal:	2017-1Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.28 VDI15 function selection

Hexadecimal:	2017-1Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.29 VDI15 logic level selection

Hexadecimal:	2017-1Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.30 VDI16 function selection

Hexadecimal:	2017-1Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	55	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.00.

Description

-

H17.31 VDI16 logic level selection

Hexadecimal:	2017-20h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

Description

-

H17.92 Communication VDO enable

Hexadecimal:	2017-5Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

To use the VDO function:

1. Enable VDO through H17.92.
2. Set the default level after power-on through H17.93.
3. Set the DO function of the VDO terminal through parameters in group H17.
4: Read the output level of the VDO terminal through H17.32.

H17.93 VDO default value after power-on

Hexadecimal:	2017-5Eh	Effective Time:	Real time

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

Value Range:

0: No default
1: VDO1 default value
2: VDO2 default value
4: VDO3 default value
8: VDO4 default value
16: VDO5 default value
32: VDO6 default value
64: VDO7 default value
128: VDO8 default value
256: VDO9 default value
512: VDO10 default value
1024: VDO11 default value
2048: VDO12 default value
4096: VDO13 default value
8192: VDO14 default value
16384: VDO15 default value
32768: VDO16 default value

Description

Used to configure the initial values of VDO upon power-on.
bit0 corresponds to VDO1.
bit1 corresponds to VDO2.
…
bit15 corresponds to VDO16.

H17.32 VDO virtual level

Hexadecimal:	2017-21h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

-

H17.33 VDO1 function selection

Hexadecimal:	2017-22h	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: No function
1: Servo ready
2: Motor rotation signal
3: Zero speed signal
4: Speed matching signal
5: Positioning completed
6: Positioning near
7: Torque limited signal
8: Speed limited signal
9: Braking
10: Warning
11: Fault
15: Interrupt positioning completed
16: Homing completed
17: Electrical homing completed
18: Torque reached signal
19: Speed reached signal
21: Enable completed
22: Internal command completed
23: Writing next command allowed
24: Internal motion completed
25: Comparison output
26: Closed-loop state
30: Warning or fault output
31: Communication-forced DO
32: EDM output

Description

-

H17.34 VDO1 logic level

Hexadecimal:	2017-23h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

-

H17.35 **VDO2 function selection**

Hexadecimal:	2017-24h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.36 **VDO2 logic level**

Hexadecimal:	2017-25h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.37 **VDO3 function selection**

Hexadecimal:	2017-26h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.38 **VDO3 logic level**

Hexadecimal:	2017-27h	Effective Time:	Real time
Min.:	0	Unit:	-

Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.39 VDO4 function selection

Hexadecimal:	2017-28h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.40 VDO4 logic level

Hexadecimal:	2017-29h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.41 VDO5 function selection

Hexadecimal:	2017-2Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.42 VDO5 logic level

Hexadecimal:	2017-2Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.43 VDO6 function selection

Hexadecimal:	2017-2Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.44 VDO6 logic level

Hexadecimal:	2017-2Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.45 VDO7 function selection

Hexadecimal:	2017-2Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.46 VDO7 logic level

Hexadecimal:	2017-2Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.47 VDO8 function selection

Hexadecimal:	2017-30h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.48 VDO8 logic level

Hexadecimal:	2017-31h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.49 VDO9 function selection

Hexadecimal:	2017-32h	Effective Time:	Real time

Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.50 VDO9 logic level

Hexadecimal:	2017-33h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.51 VDO10 function selection

Hexadecimal:	2017-34h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.52 VDO10 logic level

Hexadecimal:	2017-35h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.53 **VDO11 function selection**

Hexadecimal:	2017-36h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.54 **VDO11 logic level**

Hexadecimal:	2017-37h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.55 **VDO12 function selection**

Hexadecimal:	2017-38h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.56 **VDO12 logic level**

Hexadecimal:	2017-39h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic
Description
-

H17.57 VDO13 function selection

Hexadecimal:	2017-3Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H17.33.
Description
-

H17.58 VDO13 logic level

Hexadecimal:	2017-3Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0: Output 1 upon active logic
1: Output 0 upon active logic
Description
-

H17.59 VDO14 function selection

Hexadecimal:	2017-3Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H17.33.
Description
-

H17.60 VDO14 logic level

Hexadecimal:	2017-3Dh	Effective Time:	Real time

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

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.61 VDO15 function selection

Hexadecimal:	2017-3Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.62 VDO15 logic level

Hexadecimal:	2017-3Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

H17.63 VDO16 function selection

Hexadecimal:	2017-40h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	33	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H17.33.

Description

-

H17.64 **VDO16 logic level**

Hexadecimal:	2017-41h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

-

4.19 H18 Position Comparison Output

H18.00 **Position comparison output selection**

Hexadecimal:	2018-01h	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**

Hexadecimal:	2018-02h	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

1: Fully closed-loop position feedback

Description

-

H18.02 **Position comparison resolution**

Hexadecimal:	2018-03h	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

Hexadecimal:	2018-04h	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

Hexadecimal:	2018-05h	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

Hexadecimal:	2018-06h	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 (in ms).

H18.06 Position comparison output ABZ port polarity

Hexadecimal:	2018-07h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit	Name	Function
0	OCZ output logic	0: Positive, output high level upon active logic
		1: Negative, output low level upon active logic
1	Z output logic	0: Positive, output high level upon active logic
		1: Negative, output low level upon active logic
2	A/B output logic	0: Positive, output high level upon active logic
		1: Negative, output low level upon active logic

Description

0: Positive, output high level upon active logic

1: Negative, output low level upon active logic

Bit 0: OCZ output logic

Bit1: Z output logic

Bit2: A/B output logic

H18.07 Start point of position comparison

Hexadecimal:	2018-08h	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

Hexadecimal:	2018-09h	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

Hexadecimal:	2018-0Ah	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

Hexadecimal:	2018-0Bh	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

Hexadecimal:	2018-0Dh	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

Hexadecimal:	2018-0Fh	Effective Time:	Upon the next power-on
Min.:	-12.00	Unit:	us
Max.:	12.00	Data Type:	Int16
Default:	0.00	Change:	Immediately

Value Range:

-12.00us to 12.00us

Description

Compensates the delay caused by hardware signal output.

H18.15 Fixed cyclic comparison

Hexadecimal:	2018-10h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

1–65535

Description

-

H18.16 ABZ output function setting

Hexadecimal:	2018-11h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit	Name	Function
0	OCZ output function	0: Frequency-division output
		1: Position comparison
1	Z port output function	0: Frequency-division output
		1: Position comparison
2	A/B port output function	0: Frequency-division output
		1: Position comparison

Description

0: Frequency-division output

1: Position comparison

Bit 0: OCZ port function setting

Bit 1: Z port function setting

Bit 2: A/B function setting

H18.17 Number of fixed mode cycles

Hexadecimal:	2018-12h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

-

4.20 H19 Target Position Parameters

H19.00 Target value of position comparison 1

Hexadecimal:	2019-01h	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

Hexadecimal:	2019-03h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

bit	Function
0	Output DO active signal if current position changes from "less than" to "more than" the comparison point
1	Output DO active signal if current position changes from "more than" to "less than" the comparison point
2 to 6	Reserved
7	DO1 output
8	DO2 output
9	DO3 output
10	DO4 output
11	DO5 output
12	Frequency-division A output
13	Frequency-division B output
14	Frequency-division Z output
15	Frequency-division OCZ output

Description

-

H19.03 Target value of position comparison 2

Hexadecimal:	2019-04h	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**

Hexadecimal:	2019-06h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.06 **Target value of position comparison 3**

Hexadecimal:	2019-07h	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**

Hexadecimal:	2019-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.09 **Target value of position comparison 4**

Hexadecimal:	2019-0Ah	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**

Hexadecimal:	2019-0Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.12 **Target value of position comparison 5**

Hexadecimal:	2019-0Dh	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**

Hexadecimal:	2019-0Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.15 **Target value of position comparison 6**

Hexadecimal:	2019-10h	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

Hexadecimal:	2019-12h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.18 Target value of position comparison 7

Hexadecimal:	2019-13h	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

Hexadecimal:	2019-15h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.21 Target value of position comparison 8

Hexadecimal:	2019-16h	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

Hexadecimal:	2019-18h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.24 Target value of position comparison 9

Hexadecimal:	2019-19h	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

Hexadecimal:	2019-1Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.27 **Target value of position comparison 10**

Hexadecimal:	2019-1Ch	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**

Hexadecimal:	2019-1Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.30 **Target value of position comparison 11**

Hexadecimal:	2019-1Fh	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**

Hexadecimal:	2019-21h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.

Description

-

H19.33 **Target value of position comparison 12**

Hexadecimal:	2019-22h	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**

Hexadecimal:	2019-24h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.36 **Target value of position comparison 13**

Hexadecimal:	2019-25h	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**

Hexadecimal:	2019-27h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.39 Target value of position comparison 14

Hexadecimal:	2019-28h	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

Hexadecimal:	2019-2Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.42 Target value of position comparison 15

Hexadecimal:	2019-2Bh	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

Hexadecimal:	2019-2Dh	Effective Time:	Real time

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

Value Range:
See H19.02.
Description
-

H19.45 Target value of position comparison 16

Hexadecimal:	2019-2Eh	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

Hexadecimal:	2019-30h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.48 Target value of position comparison 17

Hexadecimal:	2019-31h	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**

Hexadecimal:	2019-33h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.51 **Target value of position comparison 18**

Hexadecimal:	2019-34h	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**

Hexadecimal:	2019-36h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.54 **Target value of position comparison 19**

Hexadecimal:	2019-37h	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**

Hexadecimal:	2019-39h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.57 **Target value of position comparison 20**

Hexadecimal:	2019-3Ah	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**

Hexadecimal:	2019-3Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.60 **Target value of position comparison 21**

Hexadecimal:	2019-3Dh	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

Hexadecimal:	2019-3Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.63 Target value of position comparison 22

Hexadecimal:	2019-40h	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

Hexadecimal:	2019-42h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.66 Target value of position comparison 23

Hexadecimal:	2019-43h	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

Hexadecimal:	2019-45h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.69 Target value of position comparison 24

Hexadecimal:	2019-46h	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

Hexadecimal:	2019-48h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.72 **Target value of position comparison 25**

Hexadecimal:	2019-49h	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**

Hexadecimal:	2019-4Bh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.75 **Target value of position comparison 26**

Hexadecimal:	2019-4Ch	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**

Hexadecimal:	2019-4Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.

Description

-

H19.78 **Target value of position comparison 27**

Hexadecimal:	2019-4Fh	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**

Hexadecimal:	2019-51h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.81 **Target value of position comparison 28**

Hexadecimal:	2019-52h	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**

Hexadecimal:	2019-54h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.84 Target value of position comparison 29

Hexadecimal:	2019-55h	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

Hexadecimal:	2019-57h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.87 Target value of position comparison 30

Hexadecimal:	2019-58h	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

Hexadecimal:	2019-5Ah	Effective Time:	Real time

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

Value Range:
See H19.02.
Description
-

H19.90 Target value of position comparison 31

Hexadecimal:	2019-5Bh	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

Hexadecimal:	2019-5Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.93 Target value of position comparison 32

Hexadecimal:	2019-5Eh	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**

Hexadecimal:	2019-60h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.96 **Target value of position comparison 33**

Hexadecimal:	2019-61h	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**

Hexadecimal:	2019-63h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.99 **Target value of position comparison 34**

Hexadecimal:	2019-64h	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**

Hexadecimal:	2019-66h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.102 **Target value of position comparison 35**

Hexadecimal:	2019-67h	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**

Hexadecimal:	2019-69h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

See H19.02.

Description

-

H19.105 **Target value of position comparison 36**

Hexadecimal:	2019-6Ah	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

Hexadecimal:	2019-6Ch	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.108 Target value of position comparison 37

Hexadecimal:	2019-6Dh	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

Hexadecimal:	2019-6Fh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.111 Target value of position comparison 38

Hexadecimal:	2019-70h	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

Hexadecimal:	2019-72h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.114 Target value of position comparison 39

Hexadecimal:	2019-73h	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

Hexadecimal:	2019-75h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

H19.117 **Target value of position comparison 40**

Hexadecimal:	2019-76h	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**

Hexadecimal:	2019-78h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
See H19.02.
Description
-

4.21 H1F Software Parameters

H1F.90 **DI function state 1 read through communication**

Hexadecimal:	201F-5Bh	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**

Hexadecimal:	201F-5Ch	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**

Hexadecimal:	201F-5Dh	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**

Hexadecimal:	201F-5Eh	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

Hexadecimal:	201F-5Fh	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

Hexadecimal:	201F-60h	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

H1F.96 DO function state 3 read through communication

Hexadecimal:	201F-61h	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 33.

Bit 1 corresponds to DO function 34.

Bit 2 corresponds to DO function 35.

…

By analogy

H1F.97 DO function state 4 read through communication

Hexadecimal:	201F-62h	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 49.

Bit 1 corresponds to DO function 50.

Bit 2 corresponds to DO function 51.

…

By analogy

4.22 H22 Technology Segment Parameters

H22.00 Process segment command trigger

Hexadecimal:	2022-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	1000	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 to 1000

Description

Used to trigger the process segment and read the state. The process segment can be triggered through the keypad or communication. The process segment state can be read through H22.00.

When triggering the technology segment:

The homing function is triggered when 0 is written to H22.00.

Process segments 1 to 15 are triggered when 1 to 15 are written to H22.00.

The process segment pauses when 1000 is written to H22.00.

E126.0 (Process segment number error) will be reported when 16 to 999 are written to H22.00.
When reading the state of the technology segment:
The process segment number will be read back when commands in the positioning mode are not done executing.
The process segment number + 10000 will be read back when commands in the positioning mode are done executing.
The process segment number + 20000 will be read back when commands in the positioning mode are done executing and positioning has been completed.

H22.01 Process segment triggered by the event rising edge

Hexadecimal:	2022-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 to 65535
Description
DI: ProceEvTri (OFF to ON, rising edge-triggered).

bit	Setpoint	Description
3 to 0	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri1.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri1.
7 to 4	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri2.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri2.
8 to 11	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri3.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri3.
15 to 12	0	Trigger DI: The motor does not act upon rising edge of ProceEvTri4.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri4.

H22.02 Process segment triggered by the event falling edge

Hexadecimal:	2022-03h	Effective Time:	Real time

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

Value Range:

0 to 65535

Description

DI: ProceEvTri (ON to OFF, falling edge-triggered).

bit	Setpoint	Description
3 to 0	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri1.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri1.
7 to 4	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri2.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri2.
8 to 11	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri3.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri3.
15 to 12	0	Trigger DI: The motor does not act upon falling edge of ProceEvTri4.
	1 to 15	Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri4.

H22.03 Acceleration/Deceleration time upon technology segment pause

Hexadecimal:	2022-04h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0: Acceleration/Deceleration time
1: Acceleration/Deceleration time 1
2: Acceleration/Deceleration time 2
3: Acceleration/Deceleration time 3
4: Acceleration/Deceleration time 4
5: Acceleration/Deceleration time 5
6: Acceleration/Deceleration time 6
7: Acceleration/Deceleration time 7

Description

When the process segment is paused, the motor ramps to stop based on the deceleration time defined by H22.03. Setpoints 0 to 7 correspond to parameters H22.35 to H22.42.

H22.04 Positive software position limit

Hexadecimal:	2022-05h	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	2147483647	Change:	Immediately

Value Range:

-2147483648 to 2147483647

Description

E956.0 can occur when the motor operates forwardly with position reference exceeding the setpoint of H22.04 during positioning in the process segment mode.

H22.06 Negative software position limit

Hexadecimal:	2022-07h	Effective Time:	Real time
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	Int32
Default:	-2147483648	Change:	Immediately

Value Range:

-2147483648 to 2147483647

Description

E958.0 can occur when the motor operates reversely with position reference exceeding the setpoint of H22.06 during positioning in the process segment mode.

H22.08 Process segment number

Hexadecimal:	2022-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

Indicates the process segment number in progress in the process segment mode.

H22.09 **Process segment function switch**

Hexadecimal:	2022-0Ah	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Bit 0:

0: Keep interrupt positioning state

1: Exit interrupt positioning state when triggering technology segment

H22.19 **Target speed**

Hexadecimal:	2022-14h	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	50.0	Change:	Immediately

Value Range:

0.1rpm–6000.0rpm

Description

Eight groups of target speed are available for each process segment command. Target speed refers to the constant operating speed when the motor is not in the acceleration/deceleration process. If the displacement is too small in the positioning mode, the actual motor speed will be lower than the setpoint of H22.19.

H22.20 **Target speed 1**

Hexadecimal:	2022-15h	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	200.0	Change:	Immediately

Value Range:

0.1rpm–6000.0rpm

Description

See H22.19.

H22.21 **Target speed 2**

Hexadecimal:	2022-16h	Effective Time:	Real time

Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	500.0	Change:	Immediately

Value Range:
0.1rpm–6000.0rpm
Description
See H22.19.

H22.22 Target speed 3

Hexadecimal:	2022-17h	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	1000.0	Change:	Immediately

Value Range:
0.1rpm–6000.0rpm
Description
See H22.19.

H22.23 Target speed 4

Hexadecimal:	2022-18h	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	1500.0	Change:	Immediately

Value Range:
0.1rpm–6000.0rpm
Description
See H22.19.

H22.24 Target speed 5

Hexadecimal:	2022-19h	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	2000.0	Change:	Immediately

Value Range:
0.1rpm–6000.0rpm
Description
See H22.19.

H22.25 Target speed 6

Hexadecimal:	2022-1Ah	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	2500.0	Change:	Immediately

Value Range:
0.1rpm–6000.0rpm
Description
See H22.19.

H22.26 Target speed 7

Hexadecimal:	2022-1Bh	Effective Time:	Real time
Min.:	0.1	Unit:	rpm
Max.:	6000.0	Data Type:	UInt16
Default:	3000.0	Change:	Immediately

Value Range:
0.1rpm–6000.0rpm
Description
See H22.19.

H22.35 Acceleration/Deceleration time

Hexadecimal:	2022-24h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
Eight groups of acceleration/deceleration time are available for each process segment command.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

H22.36 Acceleration/Deceleration time 1

Hexadecimal:	2022-25h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16

Default:	200	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.37 Acceleration/Deceleration time 2

Hexadecimal:	2022-26h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.38 Acceleration/Deceleration time 3

Hexadecimal:	2022-27h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.39 Acceleration/Deceleration time 4

Hexadecimal:	2022-28h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	1500	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.40 Acceleration/Deceleration time 5

Hexadecimal:	2022-29h	Effective Time:	Real time

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	2000	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.41 Acceleration/Deceleration time 6

Hexadecimal:	2022-2Ah	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	2500	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.42 Acceleration/Deceleration time 7

Hexadecimal:	2022-2Bh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	3000	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.35.

H22.51 Delay after completion of the process segment

Hexadecimal:	2022-34h	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

Eight groups of delay time are available for each process segment command. The delay time refers to the delay that starts from the end of current command to the operation of the next command in the process segment. See section 2.2 Process Segment Function.

H22.52 Delay time 1 after completion of the process segment

Hexadecimal:	2022-35h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.53 Delay time 2 after completion of the process segment

Hexadecimal:	2022-36h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	200	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.54 Delay time 3 after completion of the process segment

Hexadecimal:	2022-37h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.55 Delay time 4 after completion of the process segment

Hexadecimal:	2022-38h	Effective Time:	Real time

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.56 Delay time 5 after completion of the process segment

Hexadecimal:	2022-39h	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	1500	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.57 Delay time 6 after completion of the process segment

Hexadecimal:	2022-3Ah	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	2000	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.58 Delay time 7 after completion of the process segment

Hexadecimal:	2022-3Bh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	3000	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
See H22.51.

H22.70 **Homing mode**

Hexadecimal:	2022-47h	Effective Time:	Real time
Min.:	-32768	Unit:	-
Max.:	32767	Data Type:	Int16
Default:	-2	Change:	Immediately

Value Range:

-32768 to 32767

Description

Defines the default motor direction of rotation, deceleration point, and home during homing.

When H22.70 is set to a value from -2 to 35, 402 homing is used (6098h = -2...35). See section "Homing Function" in SV680P Series Servo Drive Function Guide for details.

When H22.70 is set to a value lower than or equal to -200, local homing is used (H22.70 = -200 + H05.31). See section "Homing Function" in SV680P Series Servo Drive Function Guide for details.

H22.71 **Speed in high-speed searching for the home switch signal**

Hexadecimal:	2022-48h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	100	Change:	Immediately

Value Range:

0rpm–3000rpm

Description

Defines the motor speed for searching for the deceleration point signal during homing.

H22.72 **Speed in low-speed searching for the home switch signal**

Hexadecimal:	2022-49h	Effective Time:	Real time
Min.:	0	Unit:	rpm
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	Immediately

Value Range:

0rpm–1000rpm

Description

Defines the motor speed for searching for the home signal during homing.

H22.73 Acceleration/Deceleration time during homing

Hexadecimal:	2022-4Ah	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	1000	Change:	Immediately

Value Range:

0 ms to 1000 ms

Description

Defines the time for the motor to accelerate from 0 rpm to 1000 rpm at a constant speed during homing.

H22.74 Homing time limit

Hexadecimal:	2022-4Bh	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.

H22.75 Mechanical home offset

Hexadecimal:	2022-4Ch	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.

H22.79 Relative/Absolute homing

Hexadecimal:	2022-50h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0–65535

Description

Defines the offset relationship between the mechanical home and mechanical zero point, as well as the action upon overtravel during homing.

When H22.79 is set to 0, the value of H05.40 is 2.

When H22.79 is set to 1, the value of H05.40 is 3.

4.23 H23 Technology Segment

H23.00 **Definition of homing**

Hexadecimal:	2023-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0–4294967295

Description

For details about this parameter, see section 2.2.3 Homing Mode in SV680P Series Servo Drive Function Guide.

H23.02 **Homing data**

Hexadecimal:	2023-03h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648–2147483647

Description

Not used.

H23.04 **Definition of process segment 1**

Hexadecimal:	2023-05h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 4294967295

Description

bit0 to bit3: Mode (process segment operation mode option)
Mode = 1: The fixed speed mode applies.Mode = 2: The positioning mode applies, which stops after positioning is done. Mode = 3: The next segment is executed automatically after positioning is done. Mode = 7: The jump mode applies, which is used to jump to the designated process segment. Mode = 8: The parameter-write mode applies, which allows you to write specific parameters.
For details on each mode, see section 2.2.4 in the SV680P Series Servo Drive Function Guide.

H23.06 Data of process segment 1

Hexadecimal:	2023-07h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648 to 2147483647

Description

Different modes selected in process segment 1 correspond to different process segment data. For details on each mode, see section 2.2.4 of the SV680P Series Servo Drive Function Guide.

H23.08 Definition of process segment 2

Hexadecimal:	2023-09h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0–4294967295

Description

See definition of technology segment 1.

H23.10 Data of process segment 2

Hexadecimal:	2023-0Bh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.12 **Definition of process segment 3**

Hexadecimal:	2023-0Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.14 **Data of process segment 3**

Hexadecimal:	2023-0Fh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.16 **Definition of process segment 4**

Hexadecimal:	2023-11h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.18 **Data of process segment 4**

Hexadecimal:	2023-13h	Effective Time:	Real time

Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.20 **Definition of process segment 5**

Hexadecimal:	2023-15h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.22 **Data of process segment 5**

Hexadecimal:	2023-17h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.24 **Definition of process segment 6**

Hexadecimal:	2023-19h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.26 **Data of process segment 6**

Hexadecimal:	2023-1Bh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.28 **Definition of process segment 7**

Hexadecimal:	2023-1Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.30 **Data of process segment 7**

Hexadecimal:	2023-1Fh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.32 **Definition of process segment 8**

Hexadecimal:	2023-21h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295

Description
See definition of technology segment 1.

H23.34 **Data of process segment 8**

Hexadecimal:	2023-23h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.36 **Definition of process segment 9**

Hexadecimal:	2023-25h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.38 **Data of process segment 9**

Hexadecimal:	2023-27h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.40 **Definition of process segment 10**

Hexadecimal:	2023-29h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32

Default:	0	Change:	Immediately

Value Range:

0–4294967295

Description

See definition of technology segment 1.

H23.42 Data of process segment 10

Hexadecimal:	2023-2Bh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648–2147483647

Description

See that of technology segment 1.

H23.44 Definition of process segment 11

Hexadecimal:	2023-2Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0–4294967295

Description

See definition of technology segment 1.

H23.46 Data of process segment 11

Hexadecimal:	2023-2Fh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:

-2147483648–2147483647

Description

See that of technology segment 1.

H23.48 **Definition of process segment 12**

Hexadecimal:	2023-31h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.50 **Data of process segment 12**

Hexadecimal:	2023-33h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.52 **Definition of process segment 13**

Hexadecimal:	2023-35h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.54 **Data of process segment 13**

Hexadecimal:	2023-37h	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647

Description
See that of technology segment 1.

H23.56 **Definition of process segment 14**

Hexadecimal:	2023-39h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.58 **Data of process segment 14**

Hexadecimal:	2023-3Bh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Immediately

Value Range:
-2147483648–2147483647
Description
See that of technology segment 1.

H23.60 **Definition of process segment 15**

Hexadecimal:	2023-3Dh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0–4294967295
Description
See definition of technology segment 1.

H23.62 **Data of process segment 15**

Hexadecimal:	2023-3Fh	Effective Time:	Real time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32

Default: 0 Change: Immediately

Value Range:

-2147483648–2147483647

Description

See that of technology segment 1.

4.24 H30 Related Variables Read through Communication

H30.00 Servo status read through communication

Hexadecimal: 2030-01h 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

Hexadecimal: 2030-02h Effective Time: -

Min.: 0 Unit: -

Max.: 65535 Data Type: UInt16

Default: 0 Change: Unchangeable

Value Range:

0 to 65535

Description

Used to read the state of DO functions 1 to 16 through communication. H30.01 is a hexadecimal which is not displayed on the keypad and must be converted to a binary equivalent when it is being read through communication.

bit	DO Function	Remarks
0	DO function 1 (FunOUT.1: S-RDY, servo ready)	0: Servo drive not ready 1: Servo ready
...		
15	DO function 16 (FunOUT.16: HomeAttain, homing output)	0: Home not found 1: Home found

H30.02 **DO function state 2 read through communication**

Hexadecimal:	2030-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DO function 17.

Bit 1 corresponds to DO function 18.

Bit 2 corresponds to DO function 19.

…

By analogy

bit	DO Function	Remarks
0	DO function 17 (FunOUT.17: S-ElecHomeAttain, electrical homing output)	0: Electrical homing not completed 1: Electrical homing completed
...		
4 to 15	Reserved	-

H30.03 **Input pulse reference sampling value read through communication**

Hexadecimal:	2030-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0–65535

Description

-

4.25 H31 Communication Setting

H31.00 **VDI virtual level set through communication**

Hexadecimal:	2031-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Immediately

Value Range:

0 to 65535

Description

When H17.90 is set to 1, the VDI state is defined by H31.00.

The VDI logic is determined by H17.91 (Default VDI virtual level value upon upower-on) upon initial power-on. Then, H31.00 is determined by the VDI logic. "bit(n) = 1" of H31.00 indicates the logic of VDI (n+1) is "1". "bit(n)=0" indicates the logic of VDI (n+1) is "0".

H31.01 Frequency-division output frequency set through communication

Hexadecimal:	2031-02h	Effective Time:	Real time
Min.:	0	Unit:	Hz
Max.:	16000000	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 Hz to 16000000 Hz

Description

When H05.38 is set to 4, H31.01 sets the frequency setpoint of the frequency division output port.

H31.04 DO state set through communication

Hexadecimal:	2031-05h	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

Hexadecimal:	2031-06h	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**

Hexadecimal:	2031-0Ah	Effective Time:	Real time
Min.:	-10000.000	Unit:	rpm
Max.:	10000.000	Data Type:	Int32
Default:	0.000	Change:	Immediately

Value Range:
–10000.000 RPM to +10000.000 RPM
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**

Hexadecimal:	2031-0Ch	Effective Time:	Real time
Min.:	-100.000	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.

4.26 1000h Object Dictionary

1005h **SYNC message COB-ID**

Hexadecimal:	1005h	Effective Time:	-
Min.:	128	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	128	Change:	Immediately

Value Range:
128 to 4294967295
Description
Only 0x80h and 0x40000080h can be written to the SYNC message.

If 0x80h is written, the sync generator does not work.
If 0x40000080h is written, the sync generator is activated.
To activate the sync generator, you must set 1006h to a non-zero value.

1006h **Synchronization cycle**

Hexadecimal:	1006h	Effective Time:	-
Min.:	0	Unit:	us
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0us–2147483647us
Description
Applicable to the synchronization generator only (unit: us).

100Ch **Node guarding time**

Hexadecimal:	100Ch	Effective Time:	-
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
Defines the node daemon running time, in ms.

100dh **Life factor**

Hexadecimal:	100dh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 to 255
Description
This parameter must be used together with the node daemon function and must be set to a value greater than 1.

1014h **Emergency message COB-ID**

Hexadecimal:	1014h	Effective Time:	-

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 4294967295

Description

The most significant bit indicates whether to disable the emergency message of the device. Only the data "0x80+Node_ID" can be written for the bit to enable the emergency message of the device.

If the data "0x80000080+Node_ID" is written, the emergency message is disabled.

When the emergency message takes effect, its COB-ID must be consistent with the object.

1016.01h Consumer heartbeat time 1

Hexadecimal:	1016-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Parameters include the address of the monitored node and actual consumer time, which must be longer than the heartbeat producer time (unit: ms) of the corresponding node. Two different consumer time cannot be set for one node.

Bits 0 to 15: Monitoring time

Bits 16 to 23: The monitored address

Bits 24 to 31: Reserved (0)

1016.02h Consumer heartbeat time 2

Hexadecimal:	1016-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1016.01h.

1016.03h Consumer heartbeat time 3

Hexadecimal:	1016-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1016.01h.

1016.04h Consumer heartbeat time 4

Hexadecimal:	1016-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1016.01h.

1016.05h Consumer heartbeat time 5

Hexadecimal:	1016-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1016.01h.

1017h Producer heartbeat time

Hexadecimal:	1017h	Effective Time:	-
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms

Description

Defines the heartbeat production time of the slave, in ms.

1400.01h COB-ID of RPDO1

Hexadecimal:	1400-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	512	Change:	Immediately

Value Range:

0 to 4294967295

Description

Only the most significant bit can be modified. When the most significant bit is 0, the PDO is active. When the most significant bit is 1, the PDO is inactive.

The factory settings are as follows:

1400h: 0x00000200 + Node_ID

1401h: 0x80000300 + Node_ID

1402h: 0x80000400 + Node_ID

1403h: 0x80000500 + Node_ID

1400.02h Transmission type of RPDO1

Hexadecimal:	1400-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:

0 to 255

Description

This parameter can be modified only when PDO is inactive.

Different values correspond to different PDO transmission types, as follows:

0: Not circle synchronous data

1 to 240: Circle synchronous data

254 and 255: Not circle asynchronous data

1401.01h COB-ID of RPDO2

Hexadecimal:	1401-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 4294967295
Description
Same as 1400.01h.

1401.02h Transmission type of RPDO2

Hexadecimal:	1401-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:
0 to 255
Description
Same as 1400.02h.

1402.01h COB-ID of RPDO3

Hexadecimal:	1402-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 4294967295
Description
Same as 1400.01h.

1402.02h Transmission type of RPDO3

Hexadecimal:	1402-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:
0 to 255
Description
Same as 1400.02h.

1403.01h COB-ID of RPDO4

Hexadecimal:	1403-01h	Effective Time:	-
Min.:	0	Unit:	-

Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 4294967295
Description
Same as 1400.01h.

1403.02h Transmission type of RPDO4

Hexadecimal:	1403-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:
0 to 255
Description
Same as 1400.02h.

1600.00h Number of valid mapped objects in RPDO1

Hexadecimal:	1600-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1600.01h Mapped object 1 in RPDO1

Hexadecimal:	1600-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Immediately

Value Range:
0 to 2147483647
Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1600.02h Mapped object 2 in RPDO1

Hexadecimal:	1600-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1600.03h Mapped object 3 in RPDO1

Hexadecimal:	1600-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1600.04h Mapped object 4 in RPDO1

Hexadecimal:	1600-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1600.01h.

1600.05h Mapped object 5 in RPDO1

Hexadecimal:	1600-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1600.01h.

1600.06h Mapped object 6 in RPDO1

Hexadecimal:	1600-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1600.01h.

1600.07h Mapped object 7 in RPDO1

Hexadecimal:	1600-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1600.01h.

1600.08h Mapped object 8 in RPDO1

Hexadecimal:	1600-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647

Description
Same as 1600.01h.

1601.00h Number of valid mapped objects in RPDO2

Hexadecimal:	1601-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1601.01h Mapped object 1 in RPDO2

Hexadecimal:	1601-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Immediately

Value Range:
0 to 2147483647
Description
The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.
Sub-indexes are written in the following format:
Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1601.02h Mapped object 2 in RPDO2

Hexadecimal:	1601-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1616904200	Change:	Immediately

Value Range:
0 to 2147483647

Description
Same as 1601.01h.

1601.03h Mapped object 3 in RPDO2

Hexadecimal:	1601-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.04h Mapped object 4 in RPDO2

Hexadecimal:	1601-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.05h Mapped object 5 in RPDO2

Hexadecimal:	1601-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.06h Mapped object 6 in RPDO2

Hexadecimal:	1601-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32

Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.07h Mapped object 7 in RPDO2

Hexadecimal:	1601-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1601.08h Mapped object 8 in RPDO2

Hexadecimal:	1601-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1601.01h.

1602.00h Number of valid mapped objects in RPDO3

Hexadecimal:	1602-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1602.01h Mapped object 1 in RPDO3

Hexadecimal:	1602-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Immediately

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1602.02h Mapped object 2 in RPDO3

Hexadecimal:	1602-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1618608160	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.03h Mapped object 3 in RPDO3

Hexadecimal:	1602-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1602.01h.

1602.04h Mapped object 4 in RPDO3

Hexadecimal:	1602-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1602.01h.

1602.05h Mapped object 5 in RPDO3

Hexadecimal:	1602-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1602.01h.

1602.06h Mapped object 6 in RPDO3

Hexadecimal:	1602-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1602.01h.

1602.07h Mapped object 7 in RPDO3

Hexadecimal:	1602-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647

Description
Same as 1602.01h.

1602.08h Mapped object 8 in RPDO3

Hexadecimal:	1602-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1602.01h.

1603.00h Number of valid mapped objects in RPDO4

Hexadecimal:	1603-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1603.01h Mapped object 1 in RPDO4

Hexadecimal:	1603-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614807056	Change:	Immediately

Value Range:
0 to 2147483647
Description
The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.
Sub-indexes are written in the following format:
Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1603.02h Mapped object 2 in RPDO4

Hexadecimal:	1603-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1627324448	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1603.03h Mapped object 3 in RPDO4

Hexadecimal:	1603-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1603.04h Mapped object 4 in RPDO4

Hexadecimal:	1603-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1603.05h Mapped object 5 in RPDO4

Hexadecimal:	1603-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32

Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1603.06h Mapped object 6 in RPDO4

Hexadecimal:	1603-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1603.07h Mapped object 7 in RPDO4

Hexadecimal:	1603-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1603.08h Mapped object 8 in RPDO4

Hexadecimal:	1603-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1603.01h.

1800.01h COB-ID of TPDO1

Hexadecimal:	1800-01h	Effective Time:	-

Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 4294967295

Description

Only the MSB and the second MSB can be modified.

When the MSB is 0, the PDO is valid; when MSB is 1, the PDO is invalid.

The second most significant bit defines whether the PDO can be triggered by a remote frame. You are recommended to set this bit to 1 to disable the remote frame to trigger the PDO.

The factory settings are as follows:

1800h: 0x40000180 + Node_ID

1801h: 0xC0000280 + Node_ID

1802h: 0xC0000380 + Node_ID

1803h: 0xC0000480 + Node_ID

1800.02h Transmission type of TPDO1

Hexadecimal:	1800-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:

0 to 255

Description

This parameter can be modified only when PDO is inactive. Different values correspond to different PDO transmission types, as follows:

0: Not circle synchronous data

1 to 240: Circle synchronous data

254 and 255: Not circle asynchronous data

1800.03h Inhibit time of TPDO1

Hexadecimal:	1800-03h	Effective Time:	-
Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:

0us–65535us

Description

This parameter can be modified only when PDO is inactive.
The unit is 100 µs. The value 0 indicates that the inhibit time is invalid.

1800.05h Event counter of TPDO1

Hexadecimal:	1800-05h	Effective Time:	-
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
This parameter can be modified only when PDO is inactive.
When the unit is ms, the value 0 indicates that the event counter is inactive.

1801.01h COB-ID of TPDO2

Hexadecimal:	1801-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 4294967295
Description
Same as 1800.01h.

1801.02h Transmission type of TPDO2

Hexadecimal:	1801-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:
0 to 255
Description
Same as 1800.02h.

1801.03h Inhibit time of TPDO2

Hexadecimal:	1801-03h	Effective Time:	-
Min.:	0	Unit:	100us

Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:
0us–65535us
Description
Same as 1800.03h.

1801.05h Event timer of TPDO2

Hexadecimal:	1801-05h	Effective Time:	-
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
Same as 1800.05h.

1802.01h COB-ID of TPDO3

Hexadecimal:	1802-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 4294967295
Description
Same as 1800.01h.

1802.02h Transmission type of TPDO3

Hexadecimal:	1802-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:
0 to 255
Description
Same as 1800.02h.

1802.03h Inhibit time of TPDO3

Hexadecimal:	1802-03h	Effective Time:	-
Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:

0us–65535us

Description

Same as 1800.03h.

1802.05h Event timer of TPDO3

Hexadecimal:	1802-05h	Effective Time:	-
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 65535 ms

Description

Same as 1800.05h.

1803.01h COB-ID of TPDO4

Hexadecimal:	1803-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 4294967295

Description

Same as 1800.01h.

1803.02h Transmission type of TPDO4

Hexadecimal:	1803-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	255	Data Type:	UInt16
Default:	255	Change:	Immediately

Value Range:

0 to 255

Description
Same as 1800.02h.

1803.03h Inhibit time of TPDO4

Hexadecimal:	1803-03h	Effective Time:	-
Min.:	0	Unit:	100us
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Immediately

Value Range:
0us–65535us
Description
Same as 1800.03h.

1803.05h Event timer of TPDO4

Hexadecimal:	1803-05h	Effective Time:	-
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 ms to 65535 ms
Description
Same as 1800.05h.

1A00.00h Number of valid mapped objects in TPDO1

Hexadecimal:	1A00-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A00.01h Mapped object 1 in TPDO1

Hexadecimal:	1A00-01h	Effective Time:	-
Min.:	0	Unit:	-

Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Immediately

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1A00.02h Mapped object 2 in TPDO1

Hexadecimal:	1A00-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.03h Mapped object 3 in TPDO1

Hexadecimal:	1A00-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1A00.01h.

1A00.04h Mapped object 4 in TPDO1

Hexadecimal:	1A00-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A00.01h.

1A00.05h Mapped object 5 in TPDO1

Hexadecimal:	1A00-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A00.01h.

1A00.06h Mapped object 6 in TPDO1

Hexadecimal:	1A00-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A00.01h.

1A00.07h Mapped object 7 in TPDO1

Hexadecimal:	1A00-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A00.01h.

1A00.08h Mapped object 8 in TPDO1

Hexadecimal:	1A00-08h	Effective Time:	-

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A00.01h.

1A01.00h Number of valid mapped objects in TPDO2

Hexadecimal:	1A01-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0 to 8
Description
This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A01.01h Mapped object 1 in TPDO2

Hexadecimal:	1A01-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Immediately

Value Range:
0 to 2147483647
Description
The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.
Sub-indexes are written in the following format:
Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1A01.02h Mapped object 2 in TPDO2

Hexadecimal:	1A01-02h	Effective Time:	-

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1616969736	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A01.03h Mapped object 3 in TPDO2

Hexadecimal:	1A01-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A01.04h Mapped object 4 in TPDO2

Hexadecimal:	1A01-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A01.05h Mapped object 5 in TPDO2

Hexadecimal:	1A01-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A01.06h Mapped object 6 in TPDO2

Hexadecimal:	1A01-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A01.07h Mapped object 7 in TPDO2

Hexadecimal:	1A01-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A01.08h Mapped object 8 in TPDO2

Hexadecimal:	1A01-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A01.01h.

1A02.00h Number of valid mapped objects in TPDO3

Hexadecimal:	1A02-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:
0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A02.01h Mapped object 1 in TPDO3

Hexadecimal:	1A02-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Immediately

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1A02.02h Mapped object 2 in TPDO3

Hexadecimal:	1A02-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1617166368	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.03h Mapped object 3 in TPDO3

Hexadecimal:	1A02-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description
Same as 1A02.01h.

1A02.04h Mapped object 4 in TPDO3

Hexadecimal:	1A02-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A02.01h.

1A02.05h Mapped object 5 in TPDO3

Hexadecimal:	1A02-05h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A02.01h.

1A02.06h Mapped object 6 in TPDO3

Hexadecimal:	1A02-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A02.01h.

1A02.07h Mapped object 7 in TPDO3

Hexadecimal:	1A02-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32

Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A02.08h Mapped object 8 in TPDO3

Hexadecimal:	1A02-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 2147483647

Description

Same as 1A02.01h.

1A03.00h Number of valid mapped objects in TPDO4

Hexadecimal:	1A03-00h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	2	Change:	Immediately

Value Range:

0 to 8

Description

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

1A03.01h Mapped object 1 in TPDO4

Hexadecimal:	1A03-01h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1614872592	Change:	Immediately

Value Range:

0 to 2147483647

Description

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:
Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

1A03.02h Mapped object 2 in TPDO4

Hexadecimal:	1A03-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	1617690656	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

1A03.03h Mapped object 3 in TPDO4

Hexadecimal:	1A03-03h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

1A03.04h Mapped object 4 in TPDO4

Hexadecimal:	1A03-04h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

1A03.05h Mapped object 5 in TPDO4

Hexadecimal:	1A03-05h	Effective Time:	-

Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

1A03.06h Mapped object 6 in TPDO4

Hexadecimal:	1A03-06h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

1A03.07h Mapped object 7 in TPDO4

Hexadecimal:	1A03-07h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

1A03.08h Mapped object 8 in TPDO4

Hexadecimal:	1A03-08h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:
0 to 2147483647
Description
Same as 1A03.01h.

4.27 6000h Object Dictionary

603Fh **Error Code**

Hexadecimal:	603Fh	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
When an error described in the DSP402 profile occurs on the servo drive, 603Fh is as described in DSP402.
When an error specified by the user occurs on the servo drive, 603Fh is 0xFF00.
The value of 603Fh is in hexadecimal.
In addition, the object dictionary 203Fh displays auxiliary bytes of fault codes in hexadecimal.
203Fh is a Uint 32 value, in which the high 16 bits indicate the manufacturer internal fault code, and the low 16 bits indicate the manufacturer external fault code.

6040h **Control word**

Hexadecimal:	6040h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 to 65535
Description
For description of status words, see section Basic Functions of the function guide.

6041h **Status word**

Hexadecimal:	6041h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535

Description

For description of status words, see section Basic Functions of the function guide.

605Ah Quick stop option code

Hexadecimal:	605Ah	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

Defines the quick stop mode.
Coast to stop, keep de-energized state
1: 6084h/609Ah(HM) ramp stop, keep de-energized state
2: 6085h ramp stop, keep de-energized state
3: Emergency stop torque stop, keep de-energized state
4: N/A
5: 6084h/609Ah(HM) ramp stop, keep position locked state
6: 6085h ramp stop, keep position locked state
7: Emergency stop torque stop, keep position locked state

605Ch Stop mode at S-OFF

Hexadecimal:	605Ch	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: Stop at zero speed, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/ 609Ah, keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/ 609Ah, keeping de-energized state
2: Dynamic braking stop, keeping de-energized state

Description

Sets the stop mode at S-ON OFF.
–4: Ramp to stop as defined by 6085h, keeping dynamic braking state
–3: Stop at zero speed, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/609Ah, keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah, keeping de-energized status
2: Dynamic braking stop, keeping de-energized state

605Dh Stop option code

Hexadecimal:	605Dh	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.
1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state
2: Ramp to stop as defined by 6085h, keeping position lock state
3: Stop at emergency stop torque, keeping position lock state

605Eh Stop mode at No.2 fault

Hexadecimal:	605Eh	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

Defines the stop mode at No.2 fault.
–5: Stop at zero speed, keeping dynamic braking state
–4: Stop at emergency stop torque, keeping dynamic braking state
–3: Ramp to stop as defined by 6085h, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/609Ah (HM), keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized stat
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

6060h Modes of operation

Hexadeci-mal:	6060h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

1: Profile position mode (pp)
3 Profile velocity mode (pv)
4 Profile torque mode (pt)
Homing mode (hm)
7: Interpolation mode (ip)

Description

Defines the servo drive operation mode.

0: N/A (internally forced to pp)
1: Profile position mode (pp)
3 Profile velocity mode (pv)
4 Profile torque mode (pt)
Homing mode (hm)
7: Interpolation mode (ip)
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

Hexadecimal:	6061h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
1: Profile position mode (pp)
3 Profile velocity mode (pv)
4 Profile torque mode (pt)
Homing mode (hm)
7: Interpolation mode (ip)

Description
Indicates the actual operation mode.
0: Profile position mode (pp)
1: Profile position mode (pp)
3 Profile velocity mode (pv)
4 Profile torque mode (pt)
Homing mode (hm)
7: Interpolation mode (ip)

6062h Position reference

Hexadecimal:	6062h	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

Hexadecimal:	6063h	Effective Time:	-
Min.:	-2147483648	Unit:	Pulse
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

–2147483648 to +2147483647

Description

Indicates the absolute position feedback (encoder unit) of the motor in real time.

6064h Position actual value

Hexadecimal:	6064h	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

Hexadecimal:	6065h	Effective Time:	Real time
Min.:	0	Unit:	Reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	27486951	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**

Hexadecimal:	6066h	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**

Hexadecimal:	6067h	Effective Time:	Real time
Min.:	0	Unit:	Reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	5872	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**

Hexadecimal:	6068h	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**

Hexadecimal:	606Ch	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**

Hexadecimal:	606Dh	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**

Hexadecimal:	606Eh	Effective Time:	Real time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

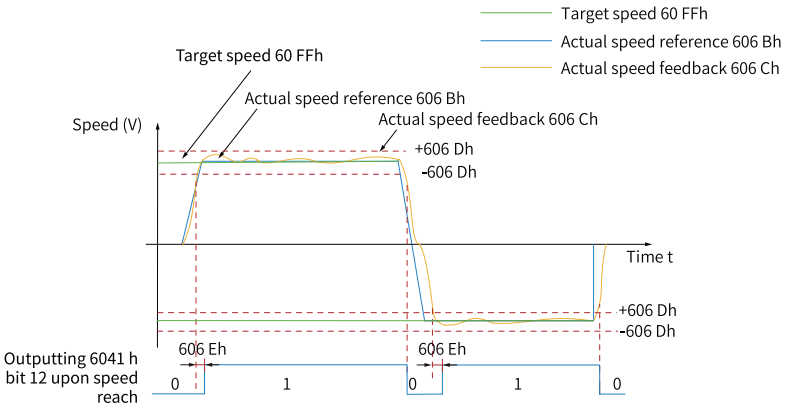
0 ms to 65535 ms

Description

Defines the time window for speed reach, which must be used together with 606Dh.

Defines the time window for speed arrival. If the difference value between 60FFh and 606Ch is within ±606Dh and the time reaches 606Eh, the position is considered to be reached and bit10 of 6041h is set to 1 in the profile velocity mode.

This flag bit is meaningful only when the servo drive is enabled in PV mode.



606Fh Velocity threshold

Hexadecimal:	606Fh	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

Hexadecimal:	6070h	Effective Time:	Real time

Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 ms to 65535 ms

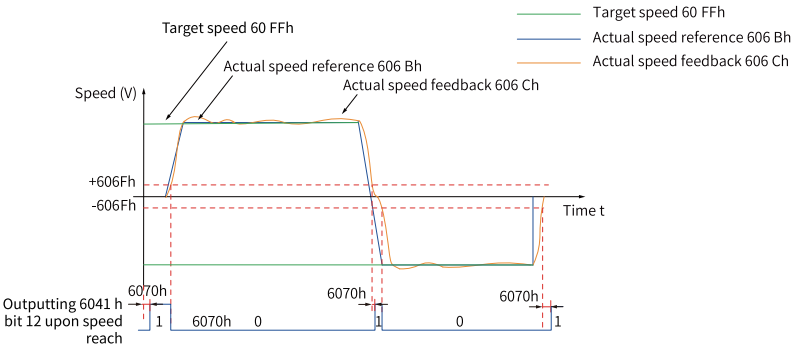
Description

Defines the time window for determining whether the user velocity is 0, which must be used together with 606Fh.

When 606Ch is within ±606Fh and the time reaches the value set by 6070h, the user velocity is 0. When either condition is not met, the user velocity is not 0.

This flag bit is meaningful only in the profile velocity mode.

This flag bit is unrelated to the enable/disable state of the servo drive.



6071h Target torque

Hexadecimal:	6071h	Effective Time:	Real time
Min.:	-4000	Unit:	0.001
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Immediately

Value Range:

-4000. to 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

Hexadecimal:	6072h	Effective Time:	Real time
Min.:	0	Unit:	0.001
Max.:	4000	Data Type:	UInt16

Default:	3500	Change:	Immediately

Value Range:

0. to 4000.

Description

Defines the maximum torque reference limit.

The value 1000 corresponds to the rated torque of the motor.

6074h Torque reference

Hexadecimal:	6074h	Effective Time:	-
Min.:	-4000	Unit:	0.001
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-4000. to 4000.

Description

Defines the target torque value.

The value 1000 corresponds to the rated torque of the motor.

6077h Torque actual value

Hexadecimal:	6077h	Effective Time:	-
Min.:	-4000	Unit:	0.001
Max.:	4000	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-4000. to 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

Hexadecimal:	607Ah	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

Hexadecimal:	607Ch	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

Hexadecimal:	607D-01h	Effective 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

Hexadecimal:	607D-02h	Effective 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

Hexadecimal:	607Eh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:
0 to 127
Description
Defines the polarity of position or speed references.
When bit 7 is 1, it indicates the position reference is multiplied by "–1" and the motor direction is reversed in the standard position mode or interpolation mode.
When bit 6 is 1, it indicates the speed reference (60FFh) is multiplied by "–1" and the motor direction is reversed in the speed mode.
When bit 5 is 1, it indicates the torque demand value (6071h) is multiplied by "–1" and the motor direction is reversed in the torque mode.
Other bits are meaningless.

607Fh Max. profile velocity

Hexadecimal:	607Fh	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32

Default:	838860800	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

Hexadecimal:	6081h	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	13981013	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

Hexadecimal:	6083h	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	1398101333	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).

6084h Profile deceleration

Hexadecimal:	6084h	Effective Time:	Real time

Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	1398101333	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).

6085h Quick stop deceleration

Hexadecimal:	6085h	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.

6087h Torque slope

Hexadecimal:	6087h	Effective Time:	Real time
Min.:	0	Unit:	0.1%/s
Max.:	4294967295	Data Type:	UInt32
Default:	4294967295	Change:	Immediately

Value Range:

0.%/s–4294967295.%/s

Description

Defines the acceleration (torque increment per second) of the torque reference in profile torque mode, indicating the torque reference increment per second.

In the profile torque mode, if 605Ah is set to 1, 2, 5, or 6, or 605Dh is set to 1 or 2, the servo drive decelerates to stop as defined by 6087h.

If the value of 6087h exceeds the torque reference limit, the limit value will be used.

6091.01h Motor resolution

Hexadecimal:	6091-01h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	1	Change:	At stop

Value Range:

1 to 4294967295

Description

Defines the numerator of the gear ratio.

Defines the proportional relation between the load shaft displacement designated by the user and the motor shaft displacement.

The relation between motor position feedback (encoder unit) and load shaft position feedback (reference unit) is as follows.

Motor position feedback = Load shaft position feedback x Gear ratio

The relation between the motor speed (RPM) and the load shaft speed (reference unit/s) is as follows.

Motor speed (RPM) = Load shaft speed * 6091h * 60/Encoder resolution

The motor acceleration (RPM/ms) and the load shaft acceleration (reference unit/s2) is in the following relationship:

Motor acceleration (RPM/ms) = Load shaft acceleration * 6091h * 1000 / Encoder resolution / 60

6091.02h Shaft resolution

Hexadecimal:	6091-02h	Effective Time:	Real time
Min.:	1	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	1	Change:	At stop

Value Range:

1 to 4294967295

Description

Defines the denominator of the gear ratio.

6098h Homing method

Hexadecimal:	6098h	Effective Time:	Real time
Min.:	-3	Unit:	-
Max.:	35	Data Type:	Int16
Default:	1	Change:	Immediately

Value Range:

-3 to 35

Description

When 6098h is set to 15, 16, 31 or 32, it is meaningless and the servo drive does not perform the homing operation.

Table 4–7 Description of homing method

Set point	Description
-3	Nearby, Z signal as home
-2	Forward, positive mechanical limit as deceleration point and Z signal as home
-1	Reverse, negative mechanical limit as deceleration point and Z signal as home
1	Reverse, negative limit switch as deceleration point and Z signal as home, falling edge of the negative limit switch signal must be reached before Z signal
2	Forward, positive limit switch as deceleration point and Z signal as home, falling edge of positive limit switch signal must be reached before Z signal
3	Forward, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
4	Forward, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
5	Reverse, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
6	Reverse, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
7	Forward, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
8	Forward, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
9	Forward, home switch as deceleration point and Z signal as home, rising edge on the other side of the home switch signal must be reached before Z signal
10	Forward, home switch as deceleration point and Z signal as home, falling edge on the other side of the home switch signal must be reached before Z signal
11	Reverse, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal
12	Reverse, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal
13	Reverse, home switch as deceleration point and Z signal on the other side of the home switch signal as home, rising edge on the other side of the home switch signal must be reached before Z signal
14	Reverse, home switch as deceleration point and Z signal on the other side of the home switch signal as home, falling edge on the other side of the home switch signal must be reached before Z signal
17 to 32	Similar to setpoints 1...14 except that the deceleration point coincide with the home

Set point	Description
33	Reverse, Z signal as home
34	Forward, Z signal as home
35	Current position as home
When 6098h is set to 15, 16, 31 or 32, it is meaningless and the servo drive does not perform the homing operation.	

6099.01h Speed during search for switch

Hexadecimal:	6099-01h	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	13981013	Change:	At stop

Value Range:

0 to 4294967295

Description

Defines the speed during search for the deceleration point signal. A large setpoint helps prevent E601.0 (Homing timeout).

6099.02h Speed during search for zero

Hexadecimal:	6099-02h	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s
Max.:	4294967295	Data Type:	UInt32
Default:	1398101	Change:	At stop

Value Range:

0 to 4294967295

Description

Defines the speed in searching for the home signal. Setting this speed to a low value prevents overshoot during stop at high speed, avoiding excessive deviation between the stop position and the set mechanical home.

609Ah Homing acceleration

Hexadecimal:	609Ah	Effective Time:	Real time
Min.:	0	Unit:	Reference unit/s^2
Max.:	4294967295	Data Type:	UInt32
Default:	1398101333	Change:	Immediately

Value Range:

0 to 4294967295

Description

Defines the acceleration rate in the homing mode.

60B8h **Touch probe function**

Hexadecimal:	60B8h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Immediately

Value Range:

0 to 65535

Description

See the following table for descriptions of each bit of 60B8h.

bit	Name	Description
0	Touch probe 1 function selection 0: Probe 1 disabled 1: Probe 1 enabled	Bit0 to bit5: settings related to probe 1 When a DI is used to trigger the touch probe function, the DI source cannot be changed once the touch probe function is enabled. For absolute encoders, 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 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 to 7	N/A	-

bit	Name	Description
8	Touch probe 2 function selection 0: Probe 2 disabled 1: Probe 2 enabled	Bit8 to bit13: settings related to probe 2
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 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 to 15	N/A	-

60B9h **Touch probe status**

Hexadecimal:	60B9h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Defines the functions of touch probe 1 and touch probe 2.

See the following table for descriptions of each bit of 60B9h.

bit	Name	Description
0	Touch probe 1 function selection 0: Probe 1 disabled 1: Probe 1 enabled	Bit0 to bit2: Status of 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	-

bit	Name	Description
6 to 7	When the function of probe 1 is selected as continuous sampling, the total number of times the probe is triggered	When the function of probe 1 is selected as continuous sampling, the total number of times (0–3) the probe is triggered
8	Touch probe 2 function selection 0: Probe 2 disabled 1: Probe 2 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	
11 to 13	N/A	-
14 to 15	When the function of probe 2 is selected as continuous sampling, the total number of times the probe is triggered	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

Hexadecimal:	60BAh	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

Hexadecimal:	60BBh	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

Hexadecimal:	60BCh	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

Hexadecimal:	60BDh	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.

60C1.01h Interpolation displacement

Hexadecimal:	60C1-01h	Effective Time:	-
Min.:	-2147483648	Unit:	Reference unit
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

-2147483648 to 2147483647

Description

Defines the displacement reference in the interpolation mode.

In interpolation mode, 60C1.01h must be set to synchronize PDO and the transmission type must be set to 1.

The host controller will send a displacement reference to the slave upon every synchronization cycle.

60C2.01h Interpolation time period

Hexadecimal:	60C2-01h	Effective Time:	Real time

Min.:	1	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	1	Change:	Immediately

Value Range:

1 to 20

Description

Defines the interpolation time units.

The allowed sync period range is 1 ms to 20 ms. When a value beyond this range is set, the setpoint is used as the sync period.

The synchronization cycle must be set after the servo drive stops running.

60C2.02h Interpolation time units

Hexadecimal:	60C2-02h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	253	Data Type:	UInt16
Default:	253	Change:	Immediately

Value Range:

0 to 253

Description

Defines the interpolation period time unit.

The value "–3" indicates the unit ms. Therefore, the actual interpolation period (ms) is the value of 60C2.01h.

60C5h Max. acceleration

Hexadecimal:	60C5h	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

Hexadecimal:	60C6h	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

Hexadecimal:	60D5h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The counting value is added by "1" each time this object is triggered.

60D6h Touch probe 1 negative edge counter

Hexadecimal:	60D6h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The counting value is added by "1" each time this object is triggered.

60D7h Touch probe 2 positive edge counter

Hexadecimal:	60D7h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The counting value is added by "2" each time this object is triggered.

60D8h Touch probe 2 negative edge counter

Hexadecimal:	60D8h	Effective Time:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The counting value is added by "2" each time this object is triggered.

60E0h Positive torque limit value

Hexadecimal:	60E0h	Effective Time:	Real time
Min.:	0	Unit:	0.001
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Immediately

Value Range:

0. to 4000.

Description

Defines the maximum torque limit of the servo drive in the forward direction.

60E1h Negative torque limit value

Hexadecimal:	60E1h	Effective Time:	Real time
Min.:	0	Unit:	0.001
Max.:	4000	Data Type:	UInt16
Default:	3500	Change:	Immediately

Value Range:

0. to 4000.

Description

Defines the maximum torque limit of the servo drive in the reverse direction.

60F4h Position deviation

Hexadecimal:	60F4h	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

Hexadecimal:	60FCh	Effective Time:	-
Min.:	-2147483648	Unit:	p
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648p to 2147483647p

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 Digital inputs

Hexadecimal:	60FDh	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Indicates current DI logic of the drive.

0: Inactive
1: Active
The signal indicated by each bit is described as follows:

bit	Function
0	Negative limit switch
1	Positive limit switch
2	Home switch
3 to 15	N/A
16	DI1 input
17	DI2 input
18	DI3 input
19	DI4 input
20	DI5 input
21	DI6 input
22	DI7 input
23	DI8 input
24 to 26	N/A
27	STO1 signal input
28	STO2 signal input
29	EDM output active
30	Z signal active
31	N/A

60FFh PV target velocity

Hexadecimal:	60FFh	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 profile velocity mode.

60FE.01h Physical outputs

Hexadecimal:	60FE-01h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32

Default: 0 Change: Immediately

Value Range:

0 to 4294967295

Description

Indicates the DO logic.

The signal indicated by each bit is described as follows:

bit	Description
0 to 15	N/A
16	Forced DO1 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 16 of 60FE.02h is set to 1
17	Forced DO2 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 17 of 60FE.02h is set to 1
18	Forced DO3 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 18 of 60FE.02h is set to 1
19	Forced DO4 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 19 of 60FE.02h is set to 1
20	Forced DO5 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 20 of 60FE.02h is set to 1
21 to 25	N/A
26	Switched between P and PI for gain switchover only when bit 26 of 60FE.02h is set to 1
27 to 31	N/A

60FE.02h Bitmask

Hexadecimal:	60FE-02h	Effective Time:	Real time
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Immediately

Value Range:

0 to 4294967295

Description

0 to 15: N/A

16: Forced DO1 output enable

17: Forced DO2 output enable

18: Forced DO3 output enable

19: Forced DO4 output enable

20: Forced DO5 output enable

19 to 25: N/A

26: P/PI switchover enable

27 to 31: N/A

5 List of Parameters

The mapping relation between the parameter displayed on the keypad (in decimal) and the object dictionary operated by the host controller (in hexadecimal, "Index" and "Sub-index") is as follows.

Object dictionary index = 0x2000 + Parameter group number

Object dictionary sub-index = Hexadecimal offset within the parameter group + 1 For example:

Operation Panel Display	Object Dictionary Operated by the Host Controller
H02.15	2002.10h

Note

The following section only describes the display and parameter settings on the keypad side (in decimal), which are different from those displayed in the software tool (in hexadecimal). Make necessary value conversions during use.

5.1 Parameter Group H00

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H00.00	2000-01h	Motor code	0 to 65535	14101	-	At stop	*" H00_en.00" on page 102*
H00.02	2000-03h	Customized No.	000000.00 to FFFFFF.FF	000000.00	-	Unchangeable	*" H00_en.02" on page 102*
H00.04	2000-05h	Encoder version	0.0 to 6553.5	0.0	-	Unchangeable	*" H00_en.04" on page 102*
H00.05	2000-06h	Serial-type motor code	0 to 65535	0	-	Unchangeable	*" H00_en.05" on page 103*
H00.06	2000-07h	FPGA customized SN	0.00 to 655.35	0.00	-	Unchangeable	*" H00_en.06" on page 103*
H00.07	2000-08h	STO version	0.00 to 655.35	0.00	-	Unchangeable	*" H00_en.07" on page 103*
H00.08	2000-09h	Serial encoder type	0 to 65535	0	-	At stop	*" H00_en.08" on page 103*

5.2 Parameter Group H01

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H01.00	2001-01h	MCU software version	0.0 to 6553.5	0.0	-	Unchangeable	*" H01_en.00" on page 104*
H01.01	2001-02h	FPGA software version	0.0 to 6553.5	0.0	-	Unchangeable	*" H01_en.01" on page 104*
H01.02	2001-03h	Servo drive series No.	0 to 65535	0	-	Unchangeable	*" H01_en.02" on page 104*
H01.06	2001-07h	Board software version	0.0 to 6553.5	0.0	-	Unchangeable	*" H01_en.06" on page 105*
H01.10	2001-0Bh	Drive series No.	2: S1R6 3: S2R8 5: S5R5 6: S7R6 7: S012 8: S018 9: S022 10: S027 10001: T3R5 10002: T5R4 10003: T8R4 10004: T012 10005: T017 10006: T021 10007: T026	3	-	At stop	*" H01_en.10" on page 105*
H01.11	2001-0Ch	DC-AC voltage class	0 V to 65535 V	220	V	Unchangeable	*" H01_en.11" on page 105*
H01.12	2001-0Dh	Rated power of the drive	0.00 kW to 10737418.24 kW	0.40	kW	Unchangeable	*" H01_en.12" on page 106*
H01.14	2001-0Fh	Max. output power of the drive	0.00 kW to 10737418.24 kW	0.40	kW	Unchangeable	*" H01_en.14" on page 106*
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 106*
H01.18	2001-13h	Max. output current of the drive	0.00 A to 10737418.24 A	10.10	A	Unchangeable	*" H01_en.18" on page 106*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H01.40	2001-29h	DC bus overvoltage protection threshold	0 V to 2000 V	420	V	Immediately	*" H01_en.40" on page 107*
H01.75	2001-4Ch	Current loop amplification factor	0.00 to 655.35	1.00	-	Immediately	*" H01_en.75" on page 107*
H01.89	2001-5Ah	Junction temperature parameter version	0.000 to 65.535	0.000	-	Unchangeable	*" H01_en.89" on page 107*

5.3 Parameter Group H02

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H02.00	2002-01h	Control mode	0: Speed control mode 1: Position control mode 2: Torque control mode 3: Torque/Speed control mode 4: Speed/Position control mode 5: Torque/Position control mode 6: Torque/Speed/Position compound mode 7: Process segment 8: CANopen mode	8	-	At stop	*" H02_en.00" on page 108*
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 108*
H02.02	2002-03h	Rotation direction selection	0: Counterclockwise (CCW) as forward direction 1: Clockwise (CW) as forward direction	0	-	At stop	*" H02_en.02" on page 109*
H02.03	2002-04h	Output pulse phase	0: Phase A leads phase B 1: Phase A lags behind phase B	0	-	At stop	*" H02_en.03" on page 109*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H02.05	2002-06h	Stop mode at S-ON OFF	-4: Stop based on ramp 2, keeping dynamic braking state -3: Stop at zero speed, keeping dynamic braking state -2: Stop based on ramp 1, keeping dynamic braking state -1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Stop based on ramp 1, keeping de-energized state 2: Dynamic braking stop, keeping de-energized state	0	-	Immediately	*" H02_en.05" on page 110*
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: Stop based on ramp 2, keeping dynamic braking state -2: Stop based on ramp 1, keeping dynamic braking state -1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Stop based on ramp 1, keeping de-energized state 2: Stop based on ramp 2, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 4: Dynamic braking stop, keeping de-energized state	2	-	Immediately	*" H02_en.06" on page 110*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
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: Stop based on ramp 2, keeping de-energized state 4: Stop based on ramp 2, keeping position lock state 5: Dynamic braking stop, keeping de-energized state 6: Dynamic braking stop, keeping dynamic braking state 7: Not responding to overtravel	1	-	At stop	" H02_en.07" on page 111
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 111
H02.09	2002-0Ah	Delay from brake output ON to command received	0 ms to 500 ms	250	ms	Immediately	" H02_en.09" on page 112
H02.10	2002-0Bh	Delay from brake output OFF to motor de-energized	50 ms to 1000 ms	150	ms	Immediately	" H02_en.10" on page 112
H02.11	2002-0Ch	Motor speed threshold at brake output OFF in rotation state	20 rpm to 3000 rpm	30	rpm	Immediately	" H02_en.11" on page 112
H02.12	2002-0Dh	Delay from S-ON OFF to brake output OFF in rotation state	1 ms to 65535 ms	500	ms	Immediately	" H02_en.12" on page 113
H02.15	2002-10h	Warning display on the keypad	0: Output warning information immediately 1: Not output warning information	0	-	Immediately	" H02_en.15" on page 113

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
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	-	Immediately	" H02_en.17" on page 113
H02.18	2002-13h	Quick stop mode	0: Coast to stop, keeping de-energized state 1: Stop by ramp 1, keeping de-energized state 2: Stop by ramp 2, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 5: Stop by ramp 1, keeping position lock state 6: Stop by ramp 2, keeping position lock state 7: Stop at emergency stop torque, keeping position lock state	2	-	Immediately	" H02_en.18" on page 114
H02.21	2002-16h	Permissible minimum resistance of regenerative resistor	1 Ω to 1000 Ω	40	Ω	Unchangeable	" H02_en.21" on page 114
H02.22	2002-17h	Power of built-in regenerative resistor	0 W to 65535 W	50	W	Unchangeable	" H02_en.22" on page 114
H02.23	2002-18h	Resistance of built-in regenerative resistor	0 Ω to 65535 Ω	50	Ω	Unchangeable	" H02_en.23" on page 115
H02.24	2002-19h	Resistor heat dissipation coefficient	10%–100%	30	%	Immediately	" H02_en.24" on page 115
H02.25	2002-1Ah	Regenerative resistor type	0: Built-in 1: External, natural cooling 2: External, forced air cooling 3: No resistor needed	3	-	Immediately	" H02_en.25" on page 116
H02.26	2002-1Bh	Power of external regenerative resistor	1 W to 65535 W	40	W	Immediately	" H02_en.26" on page 116

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H02.27	2002-1Ch	Resistance of external regenerative resistor	15 Ω to 1000 Ω	50	Ω	Immediately	*" H02_en.27" on page 116*
H02.30	2002-1Fh	User password	0 to 65535	0	-	Immediately	*" H02_en.30" on page 117*
H02.31	2002-20h	System parameter initialization	0: No operation 1: Restore default settings 2: Clear fault records	0	-	At stop	*" H02_en.31" on page 117*
H02.32	2002-21h	Selection of parameters in group H0b	0 to 99	50	-	Immediately	*" H02_en.32" on page 118*
H02.35	2002-24h	Keypad data update frequency	0 Hz–20 Hz	0	Hz	Immediately	*" H02_en.35" on page 118*
H02.38	2002-27h	Overload time of external resistor	0s–200s	40	s	Immediately	*" H02_en.38" on page 118*
H02.41	2002-2Ah	Manufacturer password	0 to 65535	0	-	Immediately	*" H02_en.41" on page 117*
H02.47	2002-30h	Delay time from power cable breakage to brake OFF	0 ms to 1000 ms	100	ms	Immediately	*" H02_en.47" on page 118*

5.4 Parameter Group H03

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H03.00	2003-01h	DI function allocation 1 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.1 2: Corresponding to FunIN.2 4: Corresponding to FunIN.3 8: Corresponding to FunIN.4 16: Corresponding to FunIN.5 32: Corresponding to FunIN.6 64: Corresponding to FunIN.7 128: Corresponding to FunIN.8 256: Corresponding to FunIN.9 512: Corresponding to FunIN.10 1024: Corresponding to FunIN.11 2048: Corresponding to FunIN.12 4096: Corresponding to FunIN.13 8192: Corresponding to FunIN.14 16384: Corresponding to FunIN.15 32768: Corresponding to FunIN.16	0	-	Immediately	*" H03_en.00" on page 119*
H03.01	2003-02h	DI function allocation 2 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.17 2: Corresponding to FunIN.18 4: Corresponding to FunIN.19 8: Corresponding to FunIN.20 16: Corresponding to FunIN.21 32: Corresponding to FunIN.22 64: Corresponding to FunIN.23 128: Corresponding to FunIN.24 256: Corresponding to FunIN.25 512: Corresponding to FunIN.26 1024: Corresponding to FunIN.27 2048: Corresponding to FunIN.28 4096: Corresponding to FunIN.29 16384: Corresponding to FunIN.31 32768: Corresponding to FunIN.32	0	-	Immediately	*" H03_en.01" on page 119*
H03.02	2003-03h	DI1 function selection	See *" H03_en.02" on page 120* for details.	14	-	Immediately	*" H03_en.02" on page 120*
H03.03	2003-04h	DI1 logic selection	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.03" on page 122*
H03.04	2003-05h	DI2 function selection	See H03.02.	15	-	Immediately	*" H03_en.04" on page 122*
H03.05	2003-06h	DI2 logic selection	0: Normally open 1: Closed	0	-	Immediately	*" H03_en.05" on page 123*
H03.06	2003-07h	DI3 function selection	See H03.02.	13	-	Immediately	*" H03_en.06" on page 123*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H03.07	2003-08h	DI3 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03_en.07" on page 123
H03.08	2003-09h	DI4 function selection	See H03.02.	2	-	Immediately	" H03_en.08" on page 123
H03.09	2003-0Ah	DI4 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03_en.09" on page 124
H03.10	2003-0Bh	DI5 function selection	See H03.02.	1	-	Immediately	" H03_en.10" on page 124
H03.11	2003-0Ch	DI5 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03_en.11" on page 124
H03.12	2003-0Dh	DI6 function selection	See H03.02.	0	-	Immediately	" H03_en.12" on page 124
H03.13	2003-0Eh	DI6 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03_en.13" on page 125
H03.14	2003-0Fh	DI7 function selection	See H03.02.	45	-	Immediately	" H03_en.14" on page 125
H03.15	2003-10h	DI7 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03_en.15" on page 125
H03.16	2003-11h	DI8 function selection	See H03.02.	31	-	Immediately	" H03_en.16" on page 126
H03.17	2003-12h	DI8 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H03_en.17" on page 126
H03.34	2003-23h	DI function allocation 3 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.33 2: Corresponding to FunIN.34 4: Corresponding to FunIN.35 8: Corresponding to FunIN.36 16: Corresponding to FunIN.37 32: Corresponding to FunIN.38 64: Corresponding to FunIN.39 128: Corresponding to FunIN.40 256: Corresponding to FunIN.41 512: Corresponding to FunIN.42 1024: Corresponding to FunIN.43 2048: Corresponding to FunIN.44 4096: Corresponding to FunIN.45 8192: Corresponding to FunIN.46 16384: Corresponding to FunIN.47 32768: Corresponding to FunIN.48	0	-	Immediately	" H03_en.34" on page 126

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H03.35	2003-24h	DI function allocation 4 (activated upon power-on)	0: Corresponding to null 1: Corresponding to FunIN.49 2: Corresponding to FunIN.50 4: Corresponding to FunIN.51 8: Corresponding to FunIN.52 16: Corresponding to FunIN.53 32: Corresponding to FunIN.54 64: Corresponding to FunIN.55 128: Corresponding to FunIN.56 256: Corresponding to FunIN.57 512: Corresponding to FunIN.58 1024: Corresponding to FunIN.59 2048: Corresponding to FunIN.60 4096: Corresponding to FunIN.61 8192: Corresponding to FunIN.62 16384: Corresponding to FunIN.63	0	-	Immediately	" H03_en.35" on page 127
H03.50	2003-33h	Voltage-type AI1 offset	-5000 mV to 5000 mV	0	mV	Immediately	" H03_en.50" on page 128
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 128
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 129
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 129
H03.60	2003-3Dh	DI1 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.60" on page 129
H03.61	2003-3Eh	DI2 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.61" on page 130
H03.62	2003-3Fh	DI3 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.62" on page 130
H03.63	2003-40h	DI4 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.63" on page 130
H03.64	2003-41h	DI5 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.64" on page 130
H03.65	2003-42h	DI6 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.65" on page 131
H03.66	2003-43h	DI7 filter time	0.00 ms to 500.00 ms	0.00	ms	Immediately	" H03_en.66" on page 131
H03.67	2003-44h	DI8 filter time	0.00 ms to 500.00 ms	3.00	ms	Immediately	" H03_en.67" on page 131

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H03.80	2003-51h	Speed corresponding to analog 10 V	0 rpm to 10000 rpm	3000	rpm	At stop	" H03_en.80" on page 132
H03.81	2003-52h	Torque corresponding to analog 10 V	1.00–8.00	1.00	-	At stop	" H03_en.81" on page 132

5.5 Parameter Group H04

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H04.00	2004-01h	DO1 function selection	0: No function 1: Servo ready 2: Motor rotation signal 3: Zero speed signal 4: Speed matching signal 5: Positioning completed 6: Positioning near 7: Torque limited signal 8: Speed limited signal 9: Braking 10: Warning 11: Fault 15: Interrupt positioning completed 16: Homing completed 17: Electrical homing completed 18: Torque reached signal 19: Speed reached signal 21: Enable completed 22: Internal command completed 23: Writing next command allowed 24: Internal motion completed 25: Comparison output 26: Closed-loop state 30: Warning or fault output 31: Communication-forced DO 32: EDM output	1	-	Immediately	" H04_en.00" on page 132
H04.01	2004-02h	DO1 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.01" on page 133

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H04.02	2004-03h	DO2 function selection	See H04.00.	9	-	Immediately	" H04_en.02" on page 134
H04.03	2004-04h	DO2 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.03" on page 134
H04.04	2004-05h	DO3 function selection	See H04.00.	0	-	Immediately	" H04_en.04" on page 134
H04.05	2004-06h	DO3 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.05" on page 134
H04.06	2004-07h	DO4 function selection	See H04.00.	11	-	Immediately	" H04_en.06" on page 135
H04.07	2004-08h	DO4 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.07" on page 135
H04.08	2004-09h	DO5 function selection	See H04.00.	16	-	Immediately	" H04_en.08" on page 135
H04.09	2004-0Ah	DO5 logic selection	0: Normally open 1: Closed	0	-	Immediately	" H04_en.09" on page 135
H04.22	2004-17h	DO source selection	bit0: DO1 0: DO1 function output 1: bit0 of H31.04 bit1: DO2 0: DO2 function output 1: bit1 of H31.04 bit2: DO3 0: DO3 function output 1: bit2 of H31.04 bit3: DO4 0: DO4 function output 1: bit3 of H31.04 bit4: DO5 0: DO5 function output 1: bit4 of H31.04	0	-	Immediately	" H04_en.22" on page 136

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H04.23	2004-18h	Communication-forced DO logic in non-OP status	bit0: DO1 0: Status unchanged 1: No output bit1: DO2 0: Status unchanged 1: No output bit2: DO3 0: Status unchanged 1: No output bit3: DO4 0: Status unchanged 1: No output bit4: DO5 0: Status unchanged 1: No output	0	-	Immediately	*" H04_en.23" on page 137*
H04.50	2004-33h	AO1 signal selection	0: Motor speed (1 V/1000 rpm) 1: Speed reference (1 V/1000 rpm) 2: Torque reference (1 V/100 x rated torque) 3: Position deviation (0.5 mV/1 reference unit) 4: Position deviation (0.5 mV/1 encoder unit) 5: Position reference speed (1 V/1000 rpm) 6: Positioning completed 8: AI1 voltage 10: Defined by H31.05	0	-	Immediately	*" H04_en.50" on page 138*
H04.51	2004-34h	AO1 offset voltage	-10000 mV to 10000 mV	0	mV	Immediately	*" H04_en.51" on page 138*
H04.52	2004-35h	AO1 multiplier	-99.99 to 99.99	1.00	-	Immediately	*" H04_en.52" on page 139*

5.6 Parameter Group H05

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.00	2005-01h	Main position reference source	0: Pulse reference 1: Step reference 2: Multi-position reference	0	-	Immediately	" H05_en.00" on page 139
H05.01	2005-02h	Position pulse reference input terminal	0: Low speed 1: High speed	0	-	At stop	" H05_en.01" on page 140
H05.02	2005-03h	Pulses per revolution	0 PPR to 4294967295 PPR	0	PPR	At stop	" H05_en.02" on page 139
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 140
H05.05	2005-06h	Step reference	-9999 to +9999	50	Reference unit	At stop	" H05_en.05" on page 141
H05.06	2005-07h	Moving average filter time constant 1	0.0 ms to 128.0 ms	30.0	ms	At stop	" H05_en.06" on page 141
H05.07	2005-08h	Electronic gear ratio 1 (numerator)	1 to 1073741824	1	-	Immediately	" H05_en.07" on page 142
H05.09	2005-0Ah	Electronic gear ratio 1 (denominator)	1 to 1073741824	1	-	Immediately	" H05_en.09" on page 142
H05.11	2005-0Ch	Electronic gear ratio 2 (numerator)	1 to 1073741824	1	-	Immediately	" H05_en.11" on page 142
H05.13	2005-0Eh	Electronic gear ratio 2 (denominator)	1 to 1073741824	1	-	Immediately	" H05_en.13" on page 143
H05.15	2005-10h	Pulse reference form	0: Direction + Pulse, positive logic 1: Direction + Pulse, negative logic 2: Phase A + phase B quadrature pulse, quadrupled frequency 3: CW + CCW	0	-	At stop	" H05_en.15" on page 143

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
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 145
H05.17	2005-12h	Number of encoder frequency-division pulses	0 PPR to 4194303 PPR	2500	PPR	At stop	" H05_en.17" on page 145
H05.19	2005-14h	Speed feedforward control	0: No speed feedforward 1: Internal speed feedforward 2: H05.72 3: Zero phase	1	-	At stop	" H05_en.19" on page 146

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.20	2005-15h	Condition for positioning completed signal output	0: Abs. position deviation below H05.21 1: Abs. position deviation below H05.21, and filtered position reference is 0 2: Abs. position deviation below H05.21, and unfiltered position reference is 0 3: Abs. position deviation is kept below H05.21 within the time defined by H05.60 and filtered position reference is 0 4: Abs. position deviation is kept below H05.21 within the time defined by H05.60 and filtered position reference is 0 5: Abs. position deviation is below H05.21, zero speed signal is active, and unfiltered position reference is 0 6: Abs. position deviation is below H05.21, zero speed signal is active, and filtered position reference is 0 7: COIN signal judged after the position reference is changed from available to unavailable before filtering and is kept active for the period defined by H05.60, unfiltered position reference is 0, and position deviation is smaller than H05.21 8: COIN signal judged after the position reference is changed from available to unavailable after filtering and is kept active for the period defined by H05.60, filtered position reference is 0, and position deviation is smaller than H05.21 9: COIN signal judged after the position reference is changed from available to unavailable before filtering, with the position deviation kept lower than H05.21 for the period defined by H05.60 or unfiltered position reference being 0 10: COIN signal judged after the position reference is changed from available to unavailable after filtering, with the position deviation kept lower than H05.21 for the period defined by H05.60 or filtered position reference being 0	0	-	Immediately	*" H05_en.20" on page 146*

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.21	2005-16h	Threshold of positioning completed	1 to 65535	5872	Encoder unit	Immediately	" H05_en.21" on page 147
H05.22	2005-17h	Proximity threshold	1 to 65535	65535	Encoder unit	Immediately	" H05_en.22" on page 148
H05.24	2005-19h	Displacement of interrupt positioning	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H05_en.24" on page 148
H05.26	2005-1Bh	Constant operating speed in interrupt positioning	0 rpm to 10000 rpm	200	rpm	Immediately	" H05_en.26" on page 148
H05.27	2005-1Ch	Acceleration/ Deceleration time of interrupt positioning	0 ms to 65535 ms	10	ms	Immediately	" H05_en.27" on page 149
H05.29	2005-1Eh	Interrupt positioning cancel signal	0: Disabled 1: Enabled	1	-	Immediately	" H05_en.29" on page 149
H05.30	2005-1Fh	Homing selection	0: Disabled 1: Homing enabled through the HomingStart signal input from DI 2: Electrical homing enabled through the HomingStart signal input from DI 3: Homing started immediately upon power-on 4: Homing executed immediately 5: Electrical homing started 6: Current position as home 8: D-triggered position as home	0	-	Immediately	" H05_en.30" on page 149

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.31	2005-20h	Homing mode	0: Forward, home switch as deceleration point and home 1: Reverse, home switch as deceleration point and home 2: Forward, Z signal as deceleration point and home 3: Reverse, motor Z signal as deceleration point and home 4: Forward, home switch as deceleration point and Z signal as home 5: Reverse, home switch as deceleration point and Z signal as home 6: Forward, positive limit switch as deceleration point and home 7: Reverse, negative limit switch as deceleration point and home 8: Forward, positive limit switch as deceleration point and Z signal as home 9: Reverse, negative limit switch as deceleration point and Z signal as home 10: Forward, mechanical limit position as deceleration point and home 11: Reverse, mechanical limit position as deceleration point and home 12: Forward, mechanical limit position as deceleration point and Z signal as home 13: Reverse, mechanical limit position as deceleration point and Z signal as home 14: Forward single-turn homing 15: Reverse single-turn homing 16: Nearby single-turn homing	0	-	Immediately	*" H05_en.31" on page 150*
H05.32	2005-21h	Speed in high-speed searching for the home switch signal	0 rpm to 3000 rpm	100	rpm	Immediately	*" H05_en.32" on page 150*

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.33	2005-22h	Speed in low-speed searching for the home switch signal	0 rpm to 1000 rpm	10	rpm	Immediately	" H05_en.33" on page 151
H05.34	2005-23h	Acceleration/ Deceleration time during homing	0 ms to 1000 ms	1000	ms	Immediately	" H05_en.34" on page 151
H05.35	2005-24h	Home search time limit	0 to 65535	10000	-	Immediately	" H05_en.35" on page 151
H05.36	2005-25h	Mechanical home offset	-2147483648 to 2147483647	0	Reference unit	Immediately	" H05_en.36" on page 151
H05.38	2005-27h	Frequency-division output source	0: Encoder frequency-division output 1: Pulse reference synchronous output 2: Frequency-division output inhibited 3: Second encoder frequency-division output 4: H31.01 Reference frequency output	0	-	Immediately	" H05_en.38" on page 152
H05.39	2005-28h	Electronic gear ratio switchover condition	0: Switchover after position reference is kept 0 for 2.5 ms 1: Switched in real time	0	-	At stop	" H05_en.39" on page 152
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 153

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.41	2005-2Ah	Z pulse output polarity	Bit 0: Frequency-division Z output polarity 0: Positive (high level upon active Z pulse) 1: Negative (low level upon active Z pulse) Bit 1: output polarity 0: Positive (high level upon active Z pulse) 1: Negative (low level upon active Z pulse) bit2: Inner loop probe Z signal source 0: Motor Z signal 1: Frequency-division output Z signal	1	-	At stop	" H05_en.41" on page 153
H05.43	2005-2Ch	Position pulse edge	0: Rising edge-triggered 1: Falling edge-triggered	0	-	Immediately	" H05_en.43" on page 155
H05.44	2005-2Dh	Numerator of frequency-division output reduction ratio	1 to 16383	1	-	At stop	" H05_en.44" on page 156
H05.45	2005-2Eh	Denominator of frequency-division output reduction ratio	1 to 8191	1	-	At stop	" H05_en.45" on page 156
H05.46	2005-2Fh	DI selection of multi-turn frequency-division Z starting point	0: No selection 1: DI1 2: DI2 3: DI3 4: DI4 5: DI5 6: DI6 7: DI7 8: DI8	0	-	Immediately	" H05_en.46" on page 156
H05.47	2005-30h	Frequency-division Z pulse width	0 us to 400 us	0	us	Immediately	" H05_en.47" on page 157

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.50	2005-33h	Mechanical gear ratio in absolute position rotation mode (numerator)	1 to 65535	1	-	At stop	" H05_en.50" on page 157
H05.51	2005-34h	Mechanical gear ratio in absolute position rotation mode (denominator)	1 to 65535	1	-	At stop	" H05_en.51" on page 157
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 158
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 158
H05.58	2005-3Bh	Torque threshold in homing upon hit-and-stop	0.0%–400.0%	100.0	%	Immediately	" H05_en.58" on page 158
H05.59	2005-3Ch	Positioning window time	0 ms to 30000 ms	0	ms	Immediately	" H05_en.59" on page 159
H05.60	2005-3Dh	Hold time of positioning completed	0 ms to 30000 ms	0	ms	Immediately	" H05_en.60" on page 159
H05.66	2005-43h	Homing time unit	0: 1 ms 1: 10 ms 2: 100 ms	2	-	At stop	" H05_en.66" on page 159

Parameter	Hex	Name	Setpoint	Default	Unit	Change Method	Page
H05.70	2005-47h	Moving average filter time constant 2	0.0 ms to 1000.0 ms	0.0	ms	At stop	" H05_en.70" on page 160
H05.71	2005-48h	Motor Z signal width	1 ms to 100 ms	4	ms	Immediately	" H05_en.71" on page 160
H05.72	2005-49h	External speed feedforward source selection	0: 60B1 1: AI1	1	-	Immediately	" H05_en.72" on page 160

5.7 Parameter Group H06

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.00	2006-01h	Source of main speed reference A	0: Digital setting (H06.03) 1: AI1	0	-	At stop	" H06_en.00" on page 160
H06.01	2006-02h	Source of auxiliary speed reference B	0: Digital setting (H06.03) 1: AI1 5: Multi-speed reference	1	-	At stop	" H06_en.01" on page 161
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 161
H06.03	2006-04h	Speed reference set through keypad	-10000 rpm to +10000 rpm	200	rpm	Immediately	" H06_en.03" on page 162
H06.04	2006-05h	DI jog speed reference	0 rpm to 10000 rpm	150	rpm	Immediately	" H06_en.04" on page 162
H06.05	2006-06h	Acceleration ramp time of speed reference	0 ms to 65535 ms	0	ms	Immediately	" H06_en.05" on page 163
H06.06	2006-07h	Deceleration ramp time of speed reference	0 ms to 65535 ms	0	ms	Immediately	" H06_en.06" on page 163

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.07	2006-08h	Maximum speed limit	0 rpm to 10000 rpm	7000	rpm	Immediately	" H06_en.07" on page 163
H06.08	2006-09h	Forward speed limit	0 rpm to 10000 rpm	7000	rpm	Immediately	" H06_en.08" on page 164
H06.09	2006-0Ah	Reverse speed limit	0 rpm to 10000 rpm	7000	rpm	Immediately	" H06_en.09" on page 164
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 164
H06.11	2006-0Ch	Torque feedforward control	0: No torque feedforward 1: Internal torque feedforward	1	-	Immediately	" H06_en.11" on page 165
H06.12	2006-0Dh	Acceleration ramp time of jog speed	0 ms to 65535 ms	10	ms	Immediately	" H06_en.12" on page 165
H06.13	2006-0Eh	Speed feedforward smoothing filter	0 us to 65535 us	0	us	Immediately	" H06_en.13" on page 165
H06.15	2006-10h	Zero clamp speed threshold	0 rpm to 10000 rpm	10	rpm	Immediately	" H06_en.15" on page 165
H06.16	2006-11h	Threshold of TGON (motor rotation) signal	0 rpm to 1000 rpm	20	rpm	Immediately	" H06_en.16" on page 166
H06.17	2006-12h	Threshold of V-Cmp (speed matching) signal	0 rpm to 100 rpm	10	rpm	Immediately	" H06_en.17" on page 166
H06.18	2006-13h	Threshold of speed reach signal	20 rpm to 10000 rpm	1000	rpm	Immediately	" H06_en.18" on page 166
H06.19	2006-14h	Threshold of zero speed output signal	1 rpm to 10000 rpm	10	rpm	Immediately	" H06_en.19" on page 166
H06.40	2006-29h	Deceleration time of ramp 1	0 ms to 65535 ms	0	ms	Immediately	" H06_en.40" on page 167

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.41	2006-2Ah	Deceleration time of ramp 2	0 ms to 65535 ms	0	ms	Immediately	" H06_en.41" on page 167
H06.50	2006-33h	Speed S-curve enable switch	0: Disabled 1: Enabled	1	-	At stop	" H06_en.50" on page 167
H06.51	2006-34h	Increasing acceleration 1 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.51" on page 168
H06.52	2006-35h	Decreasing acceleration 1 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.52" on page 168
H06.53	2006-36h	Decreasing deceleration 1 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.53" on page 168
H06.54	2006-37h	Decreasing acceleration 1 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.54" on page 168
H06.55	2006-38h	Increasing acceleration 2 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.55" on page 169
H06.56	2006-39h	Decreasing acceleration 2 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.56" on page 169

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.57	2006-3Ah	Decreasing deceleration 2 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.57" on page 169
H06.58	2006-3Bh	Decreasing acceleration 2 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.58" on page 170
H06.59	2006-3Ch	Increasing acceleration 3 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.59" on page 170
H06.60	2006-3Dh	Decreasing acceleration 3 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.60" on page 170
H06.61	2006-3Eh	Decreasing deceleration 3 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.61" on page 171
H06.62	2006-3Fh	Decreasing acceleration 3 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.62" on page 171
H06.63	2006-40h	Increasing acceleration 4 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.63" on page 171

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.64	2006-41h	Decreasing acceleration 4 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.64" on page 172
H06.65	2006-42h	Decreasing deceleration 4 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.65" on page 172
H06.66	2006-43h	Decreasing acceleration 4 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.66" on page 172
H06.67	2006-44h	Increasing acceleration 5 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.67" on page 173
H06.68	2006-45h	Decreasing acceleration 5 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.68" on page 173
H06.69	2006-46h	Decreasing deceleration 5 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.69" on page 173
H06.70	2006-47h	Decreasing acceleration 5 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	"H06_en.70" on page 174

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.71	2006-48h	Increasing acceleration 6 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.71" on page 174
H06.72	2006-49h	Decreasing acceleration 6 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.72" on page 174
H06.73	2006-4Ah	Decreasing deceleration 6 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.73" on page 175
H06.74	2006-4Bh	Decreasing acceleration 6 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.74" on page 175
H06.75	2006-4Ch	Increasing acceleration 7 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.75" on page 175
H06.76	2006-4Dh	Decreasing acceleration 7 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.76" on page 176
H06.77	2006-4Eh	Decreasing deceleration 7 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	" H06_en.77" on page 176

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H06.78	2006-4Fh	Decreasing acceleration 7 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	*" H06_en.78" on page 176*
H06.79	2006-50h	Increasing acceleration 8 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	*" H06_en.79" on page 177*
H06.80	2006-51h	Decreasing acceleration 8 of speed S-curve acceleration segment	0.0%–100.0%	50.0	%	At stop	*" H06_en.80" on page 177*
H06.81	2006-52h	Decreasing deceleration 8 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	*" H06_en.81" on page 177*
H06.82	2006-53h	Decreasing acceleration 8 of speed S-curve deceleration segment	0.0%–100.0%	50.0	%	At stop	*" H06_en.82" on page 178*

5.8 Parameter Group H07

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H07.00	2007-01h	Source of main torque reference A	0: Keypad (H7.03) 1: AI1	0	-	At stop	*" H07_en.00" on page 178*
H07.01	2007-02h	Source of auxiliary torque reference B	0: Keypad (H7.03) 1: AI1	1	-	At stop	*" H07_en.01" on page 178*

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
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 179
H07.03	2007-04h	Torque reference set through keypad	-400.0%–400.0%	0.0	%	Immediately	" H07_en.03" on page 179
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 180
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 180
H07.07	2007-08h	Torque limit source	0: Positive/Negative internal torque limit 1: Internal or external limit as defined by DI 2: T_LMT 3: T_LMT or external limit as defined by DI (FunIN.16 or FunIN.17) 4: T_LMT or internal limit (FunIN.16 or FunIN.17) as defined by DI	0	-	Immediately	" H07_en.07" on page 180
H07.08	2007-09h	T-LMT selection	1: AI1	1	-	Immediately	" H07_en.08" on page 181
H07.09	2007-0Ah	Positive internal torque limit	0.0%–400.0%	350.0	%	Immediately	" H07_en.09" on page 181
H07.10	2007-0Bh	Negative internal torque limit	0.0%–400.0%	350.0	%	Immediately	" H07_en.10" on page 181
H07.11	2007-0Ch	Positive external torque limit	0.0%–400.0%	350.0	%	Immediately	" H07_en.11" on page 181
H07.12	2007-0Dh	Negative external torque limit	0.0%–400.0%	350.0	%	Immediately	" H07_en.12" on page 182
H07.15	2007-10h	Emergency-stop torque	0.0%–400.0%	100.0	%	Immediately	" H07_en.15" on page 182

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H07.17	2007-12h	Speed limit source	0: Internal speed limit 1: V-LMT 2: H07.19 or H07.20 as defined by DI	0	-	Immediately	"H07_en.17" on page 182
H07.18	2007-13h	V-LMT selection	1: AI1	1	-	Immediately	"H07_en.18" on page 183
H07.19	2007-14h	Positive speed limit/ Speed limit 1 in torque control	0 rpm to 10000 rpm	3000	rpm	Immediately	"H07_en.19" on page 183
H07.20	2007-15h	Negative speed limit/ Speed limit 2 in torque control	0 rpm to 10000 rpm	3000	rpm	Immediately	"H07_en.20" on page 183
H07.21	2007-16h	Base value for torque reach	0.0%–400.0%	0.0	%	Immediately	"H07_en.21" on page 183
H07.22	2007-17h	Torque reach valid value	0.0%–400.0%	20.0	%	Immediately	"H07_en.22" on page 184
H07.23	2007-18h	Torque reach invalid value	0.0%–400.0%	10.0	%	Immediately	"H07_en.23" on page 184
H07.24	2007-19h	Field weakening depth	60%–115%	115	%	Immediately	"H07_en.24" on page 184
H07.25	2007-1Ah	Max. permissible demagnetizing current	0%–300%	100	%	Immediately	"H07_en.25" on page 184
H07.26	2007-1Bh	Field weakening selection	0: Disabled 1: Enabled	1	-	At stop	"H07_en.26" on page 185
H07.27	2007-1Ch	Flux weakening gain	0.001 Hz–1.000 Hz	0.030	Hz	Immediately	"H07_en.27" on page 185
H07.28	2007-1Dh	Speed of flux weakening point	0 to 65535	0	-	Unchangeable	"H07_en.28" on page 185
H07.35	2007-24h	Torque non-standard feature enable	bit0: Motor output correction enable bit1: Shield compensation data enable	0	-	At stop	"H07_en.35" on page 186

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
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 186*
H07.37	2007-26h	Torque reference filter selection	0: First-order filter 1: Biquad filter	0	-	Immediately	*" H07_en.37" on page 186*
H07.38	2007-27h	Biquad filter attenuation ratio	0 to 50	16	-	At stop	*" H07_en.38" on page 186*
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 187*

5.9 Parameter Group H08

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H08.00	2008-01h	Speed loop gain	0.1 Hz to 2000.0 Hz	40.0	Hz	Immediately	*" H08_en.00" on page 187*
H08.01	2008-02h	Speed loop integral time constant	0.15 ms to 512.00 ms	19.89	ms	Immediately	*" H08_en.01" on page 187*
H08.02	2008-03h	Position loop gain	0.1 Hz to 2000.0 Hz	64.0	Hz	Immediately	*" H08_en.02" on page 188*
H08.03	2008-04h	2nd speed loop gain	0.1 Hz to 2000.0 Hz	75.0	Hz	Immediately	*" H08_en.03" on page 188*
H08.04	2008-05h	2nd speed loop integral time constant	0.15 ms to 512.00 ms	10.61	ms	Immediately	*" H08_en.04" on page 188*
H08.05	2008-06h	2nd position loop gain	0.1 Hz to 2000.0 Hz	120.0	Hz	Immediately	*" H08_en.05" on page 189*
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	-	Immediately	*" H08_en.08" on page 189*

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	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	-	Immediately	*" H08_en.09" on page 189*
H08.10	2008-0Bh	Gain switchover delay	0.0 ms to 1000.0 ms	5.0	ms	Immediately	*" H08_en.10" on page 191*
H08.11	2008-0Ch	Gain switchover level	0–20000	50	-	Immediately	*" H08_en.11" on page 192*
H08.12	2008-0Dh	Gain switchover dead time	0–20000	30	-	Immediately	*" H08_en.12" on page 192*
H08.13	2008-0Eh	Position gain switchover time	0.0 ms to 1000.0 ms	3.0	ms	Immediately	*" H08_en.13" on page 192*
H08.15	2008-10h	Load moment of inertia ratio	0.00–120.00	1.00	-	Immediately	*" H08_en.15" on page 193*
H08.17	2008-12h	Zero phase delay	0.0 ms to 4.0 ms	0.0	ms	Immediately	*" H08_en.17" on page 193*
H08.18	2008-13h	Speed feedforward filter time constant	0.00 ms to 64.00 ms	0.50	ms	Immediately	*" H08_en.18" on page 193*
H08.19	2008-14h	Speed feedforward gain	0.0% to 100.0%	0.0	%	Immediately	*" H08_en.19" on page 194*
H08.20	2008-15h	Torque feedforward filter time constant	0.00 ms to 64.00 ms	0.50	ms	Immediately	*" H08_en.20" on page 194*
H08.21	2008-16h	Torque feedforward gain	0.0% to 300.0%	0.0	%	Immediately	*" H08_en.21" on page 194*

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
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 195
H08.23	2008-18h	Cutoff frequency of speed feedback low-pass filter	100 Hz to 8000 Hz	8000	Hz	Immediately	" H08_en.23" on page 195
H08.24	2008-19h	PDFF control coefficient	0.0% to 200.0%	100.0	%	Immediately	" H08_en.24" on page 196
H08.27	2008-1Ch	Speed observer cutoff frequency	50 Hz to 600 Hz	170	Hz	Immediately	" H08_en.27" on page 196
H08.28	2008-1Dh	Speed observer inertia correction coefficient	1% to 1600%	100	%	Immediately	" H08_en.28" on page 197
H08.29	2008-1Eh	Speed observer filter time	0.00 ms to 10.00 ms	0.80	ms	Immediately	" H08_en.29" on page 197
H08.31	2008-20h	Disturbance cutoff frequency	1 Hz to 4000 Hz	600	Hz	Immediately	" H08_en.31" on page 197
H08.32	2008-21h	Disturbance compensation gain	0% to 100%	0	%	Immediately	" H08_en.32" on page 197
H08.33	2008-22h	Disturbance observer inertia correction coefficient	1% to 1600%	100	%	Immediately	" H08_en.33" on page 198
H08.37	2008-26h	Phase modulation for medium-frequency jitter suppression 2	-90° to 90°	0	°	Immediately	" H08_en.37" on page 198

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H08.38	2008-27h	Frequency of medium-frequency jitter suppression 2	0 Hz to 1000 Hz	0	Hz	Immediately	*" H08_en.38" on page 198*
H08.39	2008-28h	Compensation gain of medium-frequency jitter suppression 2	0% to 300%	0	%	Immediately	*" H08_en.39" on page 199*
H08.40	2008-29h	Speed observer selection	0: Disabled 1: Enabled	0	-	Immediately	*" H08_en.40" on page 199*
H08.42	2008-2Bh	Model control selection	0: Disable 1: Enable 2: Dual-inertia model	0	-	Immediately	*" H08_en.42" on page 199*
H08.43	2008-2Ch	Model gain	0.1–2000.0	40.0	-	Immediately	*" H08_en.43" on page 200*
H08.46	2008-2Fh	Feedforward value	0.0–102.4	95.0	-	Immediately	*" H08_en.46" on page 200*
H08.53	2008-36h	Medium- and low-frequency jitter suppression frequency 3	0.0 Hz to 300.0 Hz	0.0	Hz	Immediately	*" H08_en.53" on page 200*
H08.54	2008-37h	Medium- and low-frequency jitter suppression compensation 3	0% to 200%	0	%	Immediately	*" H08_en.54" on page 200*
H08.56	2008-39h	Medium- and low-frequency jitter suppression phase modulation 3	0%–600%	100	%	Immediately	*" H08_en.56" on page 201*

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H08.59	2008-3Ch	Medium- and low-frequency jitter suppression frequency 4	0.0 Hz to 300.0 Hz	0.0	Hz	Immediately	" H08_en.59" on page 201
H08.60	2008-3Dh	Medium- and low-frequency jitter suppression compensation 4	0%–200%	0	%	Immediately	" H08_en.60" on page 201
H08.61	2008-3Eh	Medium- and low-frequency jitter suppression phase modulation 4	0%–600%	100	%	Immediately	" H08_en.61" on page 202
H08.62	2008-3Fh	Position loop integral time constant	0.15–512.00	512.00	-	Immediately	" H08_en.62" on page 202
H08.63	2008-40h	2nd position loop integral time constant	0.15–512.00	512.00	-	Immediately	" H08_en.63" on page 202
H08.64	2008-41h	Speed observer feedback source	0: Disabled 1: Enabled	0	-	Immediately	" H08_en.64" on page 202
H08.65	2008-42h	Zero deviation control selection	0: Disabled 1: Enabled	0	-	Immediately	" H08_en.65" on page 203
H08.66	2008-43h	Zero deviation control position average filter	0.0 ms to 320.0 ms	5.0	ms	Immediately	" H08_en.66" on page 203
H08.68	2008-45h	Speed feedforward of zero deviation control	0.0%–100.0%	100.0	%	Immediately	" H08_en.68" on page 203

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H08.69	2008-46h	Torque feedforward of zero deviation control	0.0%–100.0%	100.0	%	Immediately	*" H08_en.69" on page 203*
H08.81	2008-52h	Anti-resonance frequency of dual-inertia model	1.0 Hz to 400.0 Hz	20.0	Hz	Immediately	*" H08_en.81" on page 204*
H08.82	2008-53h	Resonance frequency of dual-inertia model	0.0 Hz to 6553.5 Hz	0.0	Hz	Immediately	*" H08_en.82" on page 204*
H08.83	2008-54h	Dual-inertia model gain	0.1/s to 300.0/s	60.0	1/s	Immediately	*" H08_en.83" on page 204*
H08.84	2008-55h	Inertia ratio of dual-inertia model	0.00–120.00	1.00	-	Immediately	*" H08_en.84" on page 205*
H08.88	2008-59h	Speed feedforward value of dual-inertia model	0.0–6553.5	100.0	-	Immediately	*" H08_en.88" on page 205*
H08.89	2008-5Ah	Torque feedforward value of dual-inertia model	0.0–6553.5	100.0	-	Immediately	*" H08_en.89" on page 205*

5.10 Parameter Group H09

Parameter	Hexadecimal Parameters	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 206*
H09.01	2009-02h	Stiffness level	0–41	15	-	Immediately	*" H09_en.01" on page 206*
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 206*
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 207*
H09.05	2009-06h	Offline inertia auto-tuning mode	0: Bi-directional 1: Unidirectional	0	-	At stop	*" H09_en.05" on page 207*
H09.06	2009-07h	Max. speed of inertia auto-tuning	100 rpm to 1000 rpm	500	rpm	At stop	*" H09_en.06" on page 207*

Parameter	Hexadecimal Parameters	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 208
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 208
H09.09	2009-0Ah	Number of motor revolutions per inertia auto-tuning	0.00 to 100.00	1.00	-	Immediately	" H09_en.09" on page 208
H09.11	2009-0Ch	Vibration threshold	0.0% to 100.0%	5.0	%	Immediately	" H09_en.11" on page 209
H09.12	2009-0Dh	Frequency of the 1st notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.12" on page 209
H09.13	2009-0Eh	Width level of the 1st notch	0 to 20	2	-	Immediately	" H09_en.13" on page 209
H09.14	2009-0Fh	Depth level of the 1st notch	0 to 99	0	-	Immediately	" H09_en.14" on page 210
H09.15	2009-10h	Frequency of the 2nd notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.15" on page 210
H09.16	2009-11h	Width level of the 2nd notch	0 to 20	2	-	Immediately	" H09_en.16" on page 210
H09.17	2009-12h	Depth level of the 2nd notch	0 to 99	0	-	Immediately	" H09_en.17" on page 211
H09.18	2009-13h	Frequency of the 3rd notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.18" on page 211
H09.19	2009-14h	Width level of the 3rd notch	0 to 20	2	-	Immediately	" H09_en.19" on page 211
H09.20	2009-15h	Depth level of the 3rd notch	0 to 99	0	-	Immediately	" H09_en.20" on page 211

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H09.21	2009-16h	Frequency of the 4th notch	50 Hz to 8000 Hz	8000	Hz	Immediately	" H09_en.21" on page 212
H09.22	2009-17h	Width level of the 4th notch	0 to 20	2	-	Immediately	" H09_en.22" on page 212
H09.23	2009-18h	Depth level of the 4th notch	0 to 99	0	-	Immediately	" H09_en.23" on page 212
H09.24	2009-19h	Auto-tuned resonance frequency	0 Hz to 5000 Hz	0	Hz	Unchangeable	" H09_en.24" on page 212
H09.26	2009-1Bh	ITune response	30.0% to 600.0%	100.0	%	Immediately	" H09_en.26" on page 213
H09.27	2009-1Ch	ITune mode	0: Disabled 1: ITune mode 1 2: ITune mode 2	0	-	Immediately	" H09_en.27" on page 213
H09.28	2009-1Dh	Minimum inertia ratio of ITune	0.0% to 80.0%	0.0	%	Immediately	" H09_en.28" on page 213
H09.29	2009-1Eh	Maximum inertia ratio of ITune	1.0% to 120.0%	30.0	%	Immediately	" H09_en.29" on page 214
H09.32	2009-21h	Gravity compensation value	-100.0% to 100.0%	0.0	%	Immediately	" H09_en.32" on page 214
H09.33	2009-22h	Positive friction compensation value	0.0% to 100.0%	0.0	%	Immediately	" H09_en.33" on page 214
H09.34	2009-23h	Negative friction compensation value	-100.0% to 0.0%	0.0	%	Immediately	" H09_en.34" on page 215
H09.35	2009-24h	Friction compensation speed	0.0 to 20.0	2.0	-	Immediately	" H09_en.35" on page 215
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 215

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H09.37	2009-26h	Vibration monitoring time	0 to 65535	600	-	Immediately	" H09_en.37" on page 216
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 216
H09.39	2009-28h	Low-frequency resonance suppression 1 at the mechanical end	0 to 3	2	-	At stop	" H09_en.39" on page 216
H09.44	2009-2Dh	Frequency of low-frequency resonance suppression 2 at mechanical load end	0.0 to 100.0	0.0	-	Immediately	" H09_en.44" on page 217
H09.45	2009-2Eh	Responsiveness of low-frequency resonance suppression 2 at mechanical load end	0.01 to 5.00	1.00	-	Immediately	" H09_en.45" on page 217
H09.47	2009-30h	Width of low-frequency resonance suppression 2 at mechanical load end	0.00 to 2.00	1.00	-	Immediately	" H09_en.47" on page 217

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H09.49	2009-32h	Frequency of low-frequency resonance suppression 3 at mechanical load end	0.0 to 100.0	0.0	-	Immediately	*" H09_en.49" on page 218*
H09.50	2009-33h	Responsiveness of low-frequency resonance suppression 3 at mechanical load end	0.01 to 5.00	1.00	-	Immediately	*" H09_en.50" on page 218*
H09.52	2009-35h	Width of low-frequency resonance suppression 3 at mechanical load end	0.00 to 2.00	1.00	-	Immediately	*" H09_en.52" on page 218*
H09.54	2009-37h	Vibration threshold	0.0% to 300.0%	50.0	%	Immediately	*" H09_en.54" on page 218*
H09.56	2009-39h	Max. overshoot allowed by ETune	0 to 65535	2936	-	Immediately	*" H09_en.56" on page 219*
H09.57	2009-3Ah	STune resonance suppression switchover frequency	0 Hz to 4000 Hz	900	Hz	Immediately	*" H09_en.57" on page 219*
H09.58	2009-3Bh	STune resonance suppression reset selection	0: Disabled 1: Enabled	0	-	Immediately	*" H09_en.58" on page 219*

5.11 Parameter Group H0A

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0A.00	200A-01h	Power input phase loss protection	0: Enable 1: Disable	0	-	Immediately	*" H0A_en.00" on page 220*
H0A.01	200A-02h	Absolute position limit	0: Disabled 1: Enabled 2: Enabled after homing	0	-	Immediately	*" H0A_en.01" on page 220*
H0A.04	200A-05h	Motor overload protection gain	50 to 300	100	-	Immediately	*" H0A_en.04" on page 220*
H0A.08	200A-09h	Overspeed threshold	0 rpm to 20000 rpm	0	rpm	Immediately	*" H0A_en.08" on page 221*
H0A.09	200A-0Ah	Max. pulse input frequency in position control	100 kHz to 8000 kHz	8000	kHz	At stop	*" H0A_en.09" on page 221*
H0A.10	200A-0Bh	Threshold of excessive local position deviation	0 to 4294967295	27486951	-	Immediately	*" H0A_en.10" on page 222*
H0A.12	200A-0Dh	Runaway protection	0: Disable 1: Enable	1	-	Immediately	*" H0A_en.12" on page 222*
H0A.17	200A-12h	Reference pulse selection	0: Pulse unit 1: Reference unit	1	-	At stop	*" H0A_en.17" on page 222*
H0A.18	200A-13h	IGBT over-temperature threshold	120°C to 175°C	140	°C	Immediately	*" H0A_en.18" on page 223*
H0A.19	200A-14h	Filter time constant of touch probe 1	0.00us–6.30us	2.00	us	Immediately	*" H0A_en.19" on page 223*
H0A.20	200A-15h	Filter time constant of touch probe 2	0.00us–6.30us	2.00	us	Immediately	*" H0A_en.20" on page 223*
H0A.23	200A-18h	TZ signal filter time	0 ns to 31 ns	15	25 ns	At stop	*" H0A_en.23" on page 224*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0A.24	200A-19h	Filter time constant of low-speed pulse input pin	0 ns to 255 ns	30	25 ns	At stop	*" H0A_en.24" on page 224*
H0A.25	200A-1Ah	Speed display DO low-pass filter time	0 ms to 5000 ms	0	ms	At stop	*" H0A_en.25" on page 224*
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	-	Immediately	*" H0A_en.26" on page 224*
H0A.27	200A-1Ch	Average filter time for speed display DO	0 ms to 100 ms	50	ms	At stop	*" H0A_en.27" on page 225*
H0A.29	200A-1Eh	Fully closed-loop encoder (ABZ) filter time	bit0–bit7: Fully closed loop encoder (ABZ) pulse signal filtering time bit8–bit15: Fully closed loop encoder (ABZ) wire breakage filter time	4111	25 ns	At stop	*" H0A_en.29" on page 225*
H0A.30	200A-1Fh	Filter time constant of high-speed pulse input pin	0 ns to 255 ns	3	ns	At stop	*" H0A_en.30" on page 225*
H0A.32	200A-21h	Motor stall over-temperature protection time window	10 ms to 65535 ms	200	ms	Immediately	*" H0A_en.32" on page 226*
H0A.33	200A-22h	Motor stall over-temperature detection	0: Disabled 1: Enabled	1	-	Immediately	*" H0A_en.33" on page 226*
H0A.36	200A-25h	Encoder multi-turn overflow fault selection	0: Not hide 1: Hide	0	-	Immediately	*" H0A_en.36" on page 226*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	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 edge solution 0: New solution 1: Old solution (same as SV660N)	6	-	At stop	*" H0A_en.40" on page 227*
H0A.41	200A-2Ah	Forward position of software position limit	-2147483648 to 2147483647	2147483647	Encoder unit	At stop	*" H0A_en.41" on page 227*
H0A.43	200A-2Ch	Reverse position of software position limit	-2147483648 to 2147483647	-2147483648	Encoder unit	At stop	*" H0A_en.43" on page 228*
H0A.49	200A-32h	Regenerative resistor overtemperature threshold	100°C to 175°C	140	°C	Immediately	*" H0A_en.49" on page 228*
H0A.50	200A-33h	Encoder communication fault tolerance threshold	0 to 31	5	-	Immediately	*" H0A_en.50" on page 228*
H0A.51	200A-34h	Phase loss detection filter times	3 ms to 36 ms	20	55 ms	Immediately	*" H0A_en.51" on page 229*
H0A.52	200A-35h	Encoder temperature protection threshold	0°C to 175°C	125	°C	Immediately	*" H0A_en.52" on page 229*
H0A.53	200A-36h	Probe DI ON compensation time	-3000 ns to 3000 ns	200	25 ns	Immediately	*" H0A_en.53" on page 229*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0A.54	200A-37h	Probe DI OFF compensation time	-3000 ns to 3000 ns	1512	25 ns	Immediately	*" H0A_en.54" on page 229*
H0A.55	200A-38h	Runaway current threshold	100.0%–400.0%	200.0	%	Immediately	*" H0A_en.55" on page 230*
H0A.56	200A-39h	Fault reset delay	0 ms to 60000 ms	10000	ms	Immediately	*" H0A_en.56" on page 230*
H0A.57	200A-3Ah	Runaway speed threshold	1 rpm to 1000 rpm	50	rpm	Immediately	*" H0A_en.57" on page 230*
H0A.58	200A-3Bh	Runaway speed filter time	0.1 ms to 100.0 ms	2.0	ms	Immediately	*" H0A_en.58" on page 231*
H0A.59	200A-3Ch	Runaway protection detection time	10 ms to 1000 ms	30	ms	Immediately	*" H0A_en.59" on page 231*
H0A.60	200A-3Dh	Black box function mode	0: Disable 1: Any fault 2: Designated fault 3: Triggered based on designated condition	1	-	Immediately	*" H0A_en.60" on page 231*
H0A.61	200A-3Eh	Designated fault code	0.0 to 6553.5	0.0	-	Immediately	*" H0A_en.61" on page 231*
H0A.62	200A-3Fh	Trigger source	0 to 25	0	-	Immediately	*" H0A_en.62" on page 232*
H0A.63	200A-40h	Trigger level	-2147483648 to 2147483647	0	-	Immediately	*" H0A_en.63" on page 232*
H0A.65	200A-42h	Trigger level	0: Rising edge 1: Equal 2: Falling edge 3: Edge-triggered	0	-	Immediately	*" H0A_en.65" on page 232*
H0A.66	200A-43h	Trigger position	0%–100%	75	%	Immediately	*" H0A_en.66" on page 233*
H0A.67	200A-44h	Sampling frequency	0: Current loop 1: Position loop 2: Main cycle	0	-	Immediately	*" H0A_en.67" on page 233*
H0A.70	200A-47h	Overspeed threshold 2	0 rpm to 20000 rpm	0	rpm	Immediately	*" H0A_en.70" on page 233*
H0A.71	200A-48h	MS1 motor overload curve switchover	0 to 65535	4098	-	Immediately	*" H0A_en.71" on page 234*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
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 234*
H0A.73	200A-4Ah	STO 24 V disconnection filter time	1 ms to 5 ms	5	ms	Immediately	*" H0A_en.73" on page 234*
H0A.74	200A-4Bh	Filter time for two inconsistent STO channels	1 ms to 1000 ms	100	ms	Immediately	*" H0A_en.74" on page 235*
H0A.75	200A-4Ch	Servo OFF delay after STO triggered	0 ms to 25 ms	20	ms	Immediately	*" H0A_en.75" on page 235*
H0A.90	200A-5Bh	Moving average filter time for speed display values	0 ms to 100 ms	0	ms	At stop	*" H0A_en.90" on page 235*
H0A.91	200A-5Ch	Moving average filter time for torque display values	0 ms to 100 ms	0	ms	At stop	*" H0A_en.91" on page 236*
H0A.92	200A-5Dh	Moving average filter time for position display values	0 ms to 100 ms	0	ms	At stop	*" H0A_en.92" on page 236*
H0A.93	200A-5Eh	Low-pass filter time for voltage display values	0 ms to 250 ms	0	ms	At stop	*" H0A_en.93" on page 236*
H0A.94	200A-5Fh	Low-pass filter time for thermal display values	0 ms to 250 ms	0	ms	At stop	*" H0A_en.94" on page 236*

5.12 Parameter Group H0d

Parameter	Hexadecimal Parameters	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 255
H0d.01	200d-02h	Fault Reset	0: No operation 1: Enable	0	-	At stop	" H0d_en.01" on page 256
H0d.02	200d-03h	Inertia auto-tuning selection	0–65	0	-	Immediately	" H0d_en.02" on page 256
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 256
H0d.05	200d-06h	Emergency stop	0: No operation 1: Emergency stop	0	-	Immediately	" H0d_en.05" on page 257
H0d.10	200d-0Bh	Auto-tuning of analog channel	0: No operation 1: AI1 adjustment	0	-	At stop	" H0d_en.10" on page 257
H0d.12	200d-0Dh	Phase U/V current balance correction	0: Disabled 1: Enabled	0	-	At stop	" H0d_en.12" on page 257
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 258
H0d.18	200d-13h	Forced DI value	0–255	255	-	Immediately	" H0d_en.18" on page 258
H0d.19	200d-14h	Forced DO value	0–31	0	-	Immediately	" H0d_en.19" on page 258
H0d.20	200d-15h	Absolute encoder reset selection	0: No operation 1: Reset fault 2: Reset fault and multi-turn data 3: Reset Inovance 2nd encoder fault 4: Reset Inovance 2nd encoder fault and multi-turn data	0	-	At stop	" H0d_en.20" on page 259
H0d.23	200d-18h	Torque fluctuation auto-tuning	0–1	0	-	At stop	" H0d_en.23" on page 259

5.13 Parameter Group H0b

Parameter	Hexadecimal Parameters	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 237*
H0b.01	200b-02h	Speed reference	-32767 rpm to +32767 rpm	0	rpm	Unchangeable	*" H0b_en.01" on page 237*
H0b.02	200b-03h	Internal torque reference	-500.0%–500.0%	0.0	%	Unchangeable	*" H0b_en.02" on page 237*
H0b.03	200b-04h	Monitored DI status	0 to 65535	0	-	Unchangeable	*" H0b_en.03" on page 238*
H0b.05	200b-06h	Monitored DO status	0 to 65535	0	-	Unchangeable	*" H0b_en.05" on page 238*
H0b.07	200b-08h	Absolute position counter	–2147483648 p to +2147483647 p	0	p	Unchangeable	*" H0b_en.07" on page 238*
H0b.09	200b-0Ah	Mechanical angle	0.0° to 360.0°	0.0	°	Unchangeable	*" H0b_en.09" on page 239*
H0b.10	200b-0Bh	Electrical angle	0.0° to 360.0°	0.0	°	Unchangeable	*" H0b_en.10" on page 239*
H0b.12	200b-0Dh	Average load rate	0.0%–800.0%	0.0	%	Unchangeable	*" H0b_en.12" on page 239*
H0b.13	200b-0Eh	Input reference counter	–2147483648 p to +2147483647 p	0	p	Unchangeable	*" H0b_en.13" on page 240*
H0b.15	200b-10h	Position following error (encoder unit)	–2147483648 p to +2147483647 p	0	p	Unchangeable	*" H0b_en.15" on page 240*
H0b.17	200b-12h	Feedback pulse counter	–2147483648 p to +2147483647 p	0	p	Unchangeable	*" H0b_en.17" on page 240*
H0b.19	200b-14h	Total power-on time	0.0s–429496729.5s	0.0	s	Unchangeable	*" H0b_en.19" on page 241*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0b.21	200b-16h	Displayed AI1 voltage	-12.00 V to 12.00 V	0.00	V	Unchangeable	" H0b_en.21" on page 241
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 241
H0b.25	200b-1Ah	Angle obtained upon voltage injection auto-tuning	0.0° to 360.0°	0.0	°	Unchangeable	" H0b_en.25" on page 241
H0b.26	200b-1Bh	Bus voltage	0.0 V to 6553.5 V	0.0	V	Unchangeable	" H0b_en.26" on page 242
H0b.27	200b-1Ch	Module temperature	-20°C to 200°C	0	°C	Unchangeable	" H0b_en.27" on page 242
H0b.28	200b-1Dh	Absolute encoder fault information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b_en.28" on page 242
H0b.29	200b-1Eh	Axis status information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b_en.29" on page 243
H0b.30	200b-1Fh	Axis fault information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b_en.30" on page 243
H0b.31	200b-20h	Encoder fault information	0 to 65535	0	-	Immediately	" H0b_en.31" on page 243

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
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 243*
H0b.34	200b-23h	Fault code of the selected fault	0 to 65535	0	-	Unchangeable	*" H0b_en.34" on page 244*
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 244*
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 245*
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 245*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
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 245*
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 245*
H0b.41	200b-2Ah	DI status upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	*" H0b_en.41" on page 246*
H0b.43	200b-2Ch	DO status upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	*" H0b_en.43" on page 246*
H0b.45	200b-2Eh	Internal fault code	0 to 65535	0	-	Unchangeable	*" H0b_en.45" on page 246*
H0b.46	200b-2Fh	Absolute encoder fault information given by FPGA upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	*" H0b_en.46" on page 247*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0b.47	200b-30h	System status information given by FPGA upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b_en.47" on page 247
H0b.48	200b-31h	System fault information given by FPGA upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b_en.48" on page 247
H0b.49	200b-32h	Encoder fault information upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b_en.49" on page 247
H0b.51	200b-34h	Internal fault code upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b_en.51" on page 248
H0b.52	200b-35h	FPGA timeout fault standard bit upon occurrence of the selected fault	0 to 65535	0	-	Unchangeable	" H0b_en.52" on page 248
H0b.53	200b-36h	Position following error (reference unit)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.53" on page 248

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0b.55	200b-38h	Motor speed actual value	-2147483648.0rpm to 2147483647.0rpm	0.0	rpm	Unchangeable	" H0b_en.55" on page 249
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 249
H0b.58	200b-3Bh	Mechanical absolute position (low 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.58" on page 249
H0b.60	200b-3Dh	Mechanical absolute position (high 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.60" on page 249
H0b.63	200b-40h	NotRdy state	0: Normal 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 250
H0b.64	200b-41h	Real-time input position reference counter	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" H0b_en.64" on page 250
H0b.66	200b-43h	Encoder temperature	-32768°C to 32767°C	0	°C	Unchangeable	" H0b_en.66" on page 251
H0b.67	200b-44h	Load rate of regenerative resistor	0.0%–200.0%	0.0	%	Unchangeable	" H0b_en.67" on page 251
H0b.70	200b-47h	Number of absolute encoder revolutions	0 Rev to 65535 Rev	0	Rev	Unchangeable	" H0b_en.70" on page 251
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 251

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0b.74	200b-4Bh	System fault information given by FPGA	0 to 65535	0	-	Unchangeable	" H0b_en.74" on page 252
H0b.77	200b-4Eh	Encoder position (low 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.77" on page 252
H0b.79	200b-50h	Encoder position (high 32 bits)	–2147483648 p to +2147483647 p	0	p	Unchangeable	" H0b_en.79" on page 252
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 252
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 253
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 253
H0b.87	200b-58h	IGBT junction temperature	0 to 200	0	-	Unchangeable	" H0b_en.87" on page 253
H0b.90	200b-5Bh	Group No. of the abnormal parameter	0 to 65535	0	-	Unchangeable	" H0b_en.90" on page 254
H0b.91	200b-5Ch	Offset within the group of the abnormal parameter	0 to 65535	0	-	Unchangeable	" H0b_en.91" on page 254
H0b.93	200b-5Eh	Closed loop state	0: Half closed loop 1: Fully closed loop	0	-	Unchangeable	" H0b_en.93" on page 254
H0b.94	200b-5Fh	Individual power-on time	0.0s–429496729.5s	0.0	s	Unchangeable	" H0b_en.94" on page 254

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
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 255
H0b.98	200b-63h	Dynamic braking resistor load rate	0.0%–200.0%	0.0	%	Unchangeable	" H0b_en.98" on page 255

5.14 Parameter Group H0E

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0E.00	200E-01h	Node address	1 to 127	1	-	At stop	" H0E_en.00" on page 259
H0E.01	200E-02h	Save objects written through communication to EEPROM	0: Not save 1: Save parameters 2: Save object dictionaries 3: Save parameters and object dictionaries 4: Save object dictionaries written before communication (OP) 255: Determine through H0E03 and H0E04	1	-	Immediately	" H0E_en.01" on page 260
H0E.03	200E-04h	Save objects written through software (commissioning protocol) to e2prom	0: Do not save 1: Save	1	-	Immediately	" H0E_en.03" on page 260

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0E.04	200E-05h	Save objects written through communication to e2prom (excluding commissioning protocol)	0: Do not save 1: Save	0	-	Immediately	" H0E_en.04" on page 260
H0E.07	200E-08h	Object dictionary unit selection	0: Reference unit system (p/s, p/s2) 1: User unit system (0.01 rpm, ms)	0	-	At stop	" H0E_en.07" on page 261
H0E.10	200E-0Bh	CAN selection	0: Pulse/Axis control command 1: Enhanced axis control command 2: CANopen	2	-	At stop	" H0E_en.10" on page 261
H0E.11	200E-0Ch	CAN baud rate	0: 20 kbps 1: 50 kbps 2: 100 kbps 3: 125 kbps 4: 250 kbps 5: 500 kbps 6: 1 Mbps 1 Mbps - non-standard	5	-	At stop	" H0E_en.11" on page 262
H0E.12	200E-0Dh	Excessive IP position command increment count	1 to 30	20	-	Immediately	" H0E_en.12" on page 262
H0E.13	200E-0Eh	CANopen sync period error limit	0: 1/4 1: 1/2 2: 3/4 3: 1 4: 2 5: Disabled	0	-	Immediately	" H0E_en.13" on page 263
H0E.14	200E-0Fh	CANopen communication state	0 to 9	0	-	Unchangeable	" H0E_en.14" on page 263
H0E.17	200E-12h	Get the count of received NMT frames with incorrect length	0 to 65535	0	-	Unchangeable	" H0E_en.17" on page 263

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0E.18	200E-13h	Get the count of received NMT frames with incorrect command	0 to 65535	0	-	Unchangeable	" H0E_en.18" on page 263
H0E.19	200E-14h	Get received heartbeat frames of wrong length	0 to 65535	0	-	Unchangeable	" H0E_en.19" on page 264
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	-	Immediately	" H0E_en.80" on page 264
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	-	Immediately	" H0E_en.81" on page 265
H0E.82	200E-53h	Modbus response delay	0 ms to 20 ms	0	ms	Immediately	" H0E_en.82" on page 265
H0E.83	200E-54h	Modbus communication timeout	0 ms to 600 ms	0	ms	Immediately	" H0E_en.83" on page 265
H0E.84	200E-55h	Sequence of Modbus communication data bits	0: High bits before low bits 1: Low bits before high bits	1	-	Immediately	" H0E_en.84" on page 266
H0E.90	200E-5Bh	Modbus version	0.00 to 655.35	0.00	-	Unchangeable	" H0E_en.90" on page 266
H0E.91	200E-5Ch	CANopen version number	0.00 to 655.35	0.00	-	Unchangeable	" H0E_en.91" on page 266
H0E.92	200E-5Dh	CANlink version	0.00 to 655.35	0.00	-	Unchangeable	" H0E_en.92" on page 266

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H0E.97	200E-62h	Communication monitoring parameter 1	0 to 65535	0	-	Immediately	*" H0E_en.97" on page 267*
H0E.98	200E-63h	Communication monitoring parameter 2	0 to 65535	0	-	Immediately	*" H0E_en.98" on page 267*

5.15 Parameter Group H0F

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0F.00	200F-01h	Encoder feedback mode	0: Internal encoder feedback 1: External encoder feedback 2: Inner/Outer loop switchover	0	-	Immediately	*" H0F_en.00" on page 267*
H0F.01	200F-02h	External encoder usage mode	0: Standard operating direction 1: Reverse operating direction	0	-	Immediately	*" H0F_en.01" on page 268*
H0F.02	200F-03h	External encoder absolute value	0: Incremental 1: Absolute linear	0	-	At stop	*" H0F_en.02" on page 268*
H0F.03	200F-04h	External encoder feedback type	0: Quadrature pulse	0	-	At stop	*" H0F_en.03" on page 269*
H0F.04	200F-05h	External encoder pulses per revolution	0 to 2147483647	10000	-	At stop	*" H0F_en.04" on page 269*
H0F.08	200F-09h	Excessive deviation threshold in compound control mode	0 to 2147483647	1000	-	Immediately	*" H0F_en.08" on page 270*
H0F.10	200F-0Bh	Clear deviation in compound control mode	0 rpm to 100 rpm	1	rpm	Immediately	*" H0F_en.10" on page 270*

Parameter	Communication Address	Name	Setpoint	Default	Unit	Change Method	Page
H0F.13	200F-0Eh	Compound vibration suppression filter time	0.0 ms to 6553.5 ms	0.0	ms	At stop	*" H0F_en.13" on page 271*
H0F.16	200F-11h	Pulse deviation display in compound control mode	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" H0F_en.16" on page 271*
H0F.18	200F-13h	Internal position pulse feedback display	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" H0F_en.18" on page 271*
H0F.20	200F-15h	External position pulse feedback display	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" H0F_en.20" on page 272*
H0F.22	200F-17h	External encoder phase Z detection invalid (quadrature pulse feedback)	0: Detected 1: Not detected	0	-	Immediately	*" H0F_en.22" on page 272*
H0F.25	200F-1Ah	Set the source of touch probe Z signal in fully closed-loop mode.	0: Motor Z signal 1: External feedback Z signal	0	-	Immediately	*" H0F_en.25" on page 273*
H0F.45	200F-2Eh	Positioning completed/ Position deviation threshold in fully closed-loop mode	0: Threshold scaled to outer loop unit 1: Same threshold used for inner and outer loops	0	-	At stop	*" H0F_en.45" on page 275*
H0F.46	200F-2Fh	Fully closed-loop speed feedback selection	0: Internal encoder feedback 1: External encoder feedback	0	-	At stop	*" H0F_en.46" on page 275*

5.16 Parameter Group H11

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.00	2011-01h	Multi-position operation mode	0: Single run (number of displacements selected in H11.01) 1: Cyclic operation (number of displacement selected in H11.01) 2: DI-based operation (selected by DI) 3: Sequential operation 5: Axis-controlled continuous operation	1	-	At stop	*" H11_en.00" on page 276*
H11.01	2011-02h	Number of displacement references in multi-position mode	1 to 16	1	-	At stop	*" H11_en.01" on page 279*
H11.02	2011-03h	Starting displacement No. after pause	0: Continue to execute the unexecuted displacements 1: Start from displacement 1	0	-	At stop	*" H11_en.02" on page 279*
H11.03	2011-04h	Interval time unit	0: ms 1: s	0	-	At stop	*" H11_en.03" on page 280*
H11.04	2011-05h	Displacement reference type	0: Relative displacement reference 1: Absolute displacement reference	0	-	Immediately	*" H11_en.04" on page 280*
H11.05	2011-06h	Starting displacement No. in sequential operation	0–16	0	-	At stop	*" H11_en.05" on page 281*
H11.09	2011-0Ah	Deceleration upon axis control OFF	0 ms to 65535 ms	65535	ms	Immediately	*" H11_en.09" on page 281*
H11.10	2011-0Bh	Starting speed of displacement 1	0 rpm to 10000 rpm	0	rpm	Immediately	*" H11_en.10" on page 281*
H11.11	2011-0Ch	Stop speed of displacement 1	0 rpm to 10000 rpm	0	rpm	Immediately	*" H11_en.11" on page 282*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.12	2011-0Dh	Displacement 1	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11_en.12" on page 282
H11.14	2011-0Fh	Max. speed of displacement 1	1 rpm to 10000 rpm	200	rpm	Immediately	" H11_en.14" on page 282
H11.15	2011-10h	Acc/Dec time of displacement 1	0 ms to 65535 ms	10	ms	Immediately	" H11_en.15" on page 283
H11.16	2011-11h	Interval time after displacement 1	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11_en.16" on page 283
H11.17	2011-12h	Displacement 2	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11_en.17" on page 284
H11.19	2011-14h	Max. speed of displacement 2	1 rpm to 10000 rpm	200	rpm	Immediately	" H11_en.19" on page 284
H11.20	2011-15h	Acc/Dec time of displacement 2	0 ms to 65535 ms	10	ms	Immediately	" H11_en.20" on page 284
H11.21	2011-16h	Interval time after displacement 2	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11_en.21" on page 285
H11.22	2011-17h	Displacement 3	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11_en.22" on page 285
H11.24	2011-19h	Max. speed of displacement 3	1 rpm to 10000 rpm	200	rpm	Immediately	" H11_en.24" on page 285
H11.25	2011-1Ah	Acc/Dec time of displacement 3	0 ms to 65535 ms	10	ms	Immediately	" H11_en.25" on page 286
H11.26	2011-1Bh	Interval time after displacement 3	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11_en.26" on page 286

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.27	2011-1Ch	Displacement 4	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.27" on page 286
H11.29	2011-1Eh	Max. speed of displacement 4	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.29" on page 286
H11.30	2011-1Fh	Acc/Dec time of displacement 4	0 ms to 65535 ms	10	ms	Immediately	"H11_en.30" on page 287
H11.31	2011-20h	Interval time after displacement 4	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.31" on page 287
H11.32	2011-21h	Displacement 5	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.32" on page 287
H11.34	2011-23h	Max. speed of displacement 5	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.34" on page 287
H11.35	2011-24h	Acc/Dec time of displacement 5	0 ms to 65535 ms	10	ms	Immediately	"H11_en.35" on page 288
H11.36	2011-25h	Interval time after displacement 5	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.36" on page 288
H11.37	2011-26h	Displacement 6	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.37" on page 288
H11.39	2011-28h	Max. speed of displacement 6	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.39" on page 289
H11.40	2011-29h	Acc/Dec time of displacement 6	0 ms to 65535 ms	10	ms	Immediately	"H11_en.40" on page 289
H11.41	2011-2Ah	Interval time after displacement 6	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.41" on page 289

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.42	2011-2Bh	Displacement 7	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.42" on page 289
H11.44	2011-2Dh	Max. speed of displacement 7	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.44" on page 290
H11.45	2011-2Eh	Acc/Dec time of displacement 7	0 ms to 65535 ms	10	ms	Immediately	"H11_en.45" on page 290
H11.46	2011-2Fh	Interval time after displacement 7	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.46" on page 290
H11.47	2011-30h	Displacement 8	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.47" on page 290
H11.49	2011-32h	Max. speed of displacement 8	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.49" on page 291
H11.50	2011-33h	Acc/Dec time of displacement 8	0 ms to 65535 ms	10	ms	Immediately	"H11_en.50" on page 291
H11.51	2011-34h	Interval time after displacement 8	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.51" on page 291
H11.52	2011-35h	Displacement 9	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.52" on page 292
H11.54	2011-37h	Max. speed of displacement 9	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.54" on page 292
H11.55	2011-38h	Acc/Dec time of displacement 9	0 ms to 65535 ms	10	ms	Immediately	"H11_en.55" on page 292
H11.56	2011-39h	Interval time after displacement 9	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.56" on page 292

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.57	2011-3Ah	Displacement 10	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.57" on page 293
H11.59	2011-3Ch	Max. speed of displacement 10	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.59" on page 293
H11.60	2011-3Dh	Acc/Dec time of displacement 10	0 ms to 65535 ms	10	ms	Immediately	"H11_en.60" on page 293
H11.61	2011-3Eh	Interval time after displacement 10	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.61" on page 293
H11.62	2011-3Fh	Displacement 11	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.62" on page 294
H11.64	2011-41h	Max. speed of displacement 11	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.64" on page 294
H11.65	2011-42h	Acc/Dec time of displacement 11	0 ms to 65535 ms	10	ms	Immediately	"H11_en.65" on page 294
H11.66	2011-43h	Interval time after displacement 11	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.66" on page 294
H11.67	2011-44h	Displacement 12	-1073741824 to 1073741824	10000	Reference unit	Immediately	"H11_en.67" on page 295
H11.69	2011-46h	Max. speed of displacement 12	1 rpm to 10000 rpm	200	rpm	Immediately	"H11_en.69" on page 295
H11.70	2011-47h	Acc/Dec time of displacement 12	0 ms to 65535 ms	10	ms	Immediately	"H11_en.70" on page 295
H11.71	2011-48h	Interval time after displacement 12	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	"H11_en.71" on page 296

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.72	2011-49h	Displacement 13	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11_en.72" on page 296
H11.74	2011-4Bh	Max. speed of displacement 13	1 rpm to 10000 rpm	200	rpm	Immediately	" H11_en.74" on page 296
H11.75	2011-4Ch	Acc/Dec time of displacement 13	0 ms to 65535 ms	10	ms	Immediately	" H11_en.75" on page 296
H11.76	2011-4Dh	Interval time after displacement 13	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11_en.76" on page 297
H11.77	2011-4Eh	Displacement 14	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11_en.77" on page 297
H11.79	2011-50h	Max. speed of displacement 14	1 rpm to 10000 rpm	200	rpm	Immediately	" H11_en.79" on page 297
H11.80	2011-51h	Acc/Dec time of displacement 14	0 ms to 65535 ms	10	ms	Immediately	" H11_en.80" on page 297
H11.81	2011-52h	Interval time after displacement 14	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11_en.81" on page 298
H11.82	2011-53h	Displacement 15	-1073741824 to 1073741824	10000	Reference unit	Immediately	" H11_en.82" on page 298
H11.84	2011-55h	Max. speed of displacement 15	1 rpm to 10000 rpm	200	rpm	Immediately	" H11_en.84" on page 298
H11.85	2011-56h	Acc/Dec time of displacement 15	0 ms to 65535 ms	10	ms	Immediately	" H11_en.85" on page 299
H11.86	2011-57h	Interval time after displacement 15	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	" H11_en.86" on page 299

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H11.87	2011-58h	Displacement 16	-1073741824 to 1073741824	10000	Reference unit	Immediately	*"H11_en.87" on page 299*
H11.89	2011-5Ah	Max. speed of displacement 16	1 rpm to 10000 rpm	200	rpm	Immediately	*"H11_en.89" on page 299*
H11.90	2011-5Bh	Acc/Dec time of displacement 16	0 ms to 65535 ms	10	ms	Immediately	*"H11_en.90" on page 300*
H11.91	2011-5Ch	Interval time after displacement 16	0 ms (s)–10000 ms (s)	10	ms (s)	Immediately	*"H11_en.91" on page 300*

5.17 Parameter Group H12

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H12.00	2012-01h	Multi-speed operation mode	0: Individual operation (number of speeds selected in H12.01) 1: Cyclic operation (number of speeds selected in H12.01) 2: DI-based operation	1	-	At stop	*"H12_en.00" on page 300*
H12.01	2012-02h	Number of speed references in multi-speed mode	1 to 16	16	-	At stop	*"H12_en.01" on page 302*
H12.02	2012-03h	Operating time unit	0: s 1: min	0	-	At stop	*"H12_en.02" on page 302*
H12.03	2012-04h	Acceleration time 1	0 ms to 65535 ms	10	ms	Immediately	*"H12_en.03" on page 303*
H12.04	2012-05h	Deceleration time 1	0 ms to 65535 ms	10	ms	Immediately	*"H12_en.04" on page 303*
H12.05	2012-06h	Acceleration time 2	0 ms to 65535 ms	50	ms	Immediately	*"H12_en.05" on page 303*
H12.06	2012-07h	Deceleration time 2	0 ms to 65535 ms	50	ms	Immediately	*"H12_en.06" on page 304*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H12.07	2012-08h	Acceleration time 3	0 ms to 65535 ms	100	ms	Immediately	"H12_en.07" on page 304
H12.08	2012-09h	Deceleration time 3	0 ms to 65535 ms	100	ms	Immediately	"H12_en.08" on page 304
H12.09	2012-0Ah	Acceleration time 4	0 ms to 65535 ms	150	ms	Immediately	"H12_en.09" on page 305
H12.10	2012-0Bh	Deceleration time 4	0 ms to 65535 ms	150	ms	Immediately	"H12_en.10" on page 305
H12.20	2012-15h	Speed reference 1	–10000 RPM to +10000 RPM	0	rpm	Immediately	"H12_en.20" on page 305
H12.21	2012-16h	Operating time of speed 1	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.21" on page 305
H12.22	2012-17h	1st speed rise/drop and curve smoothing parameter time	bit0-bit7: Speed rise and drop time 0: Zero acc and dec time 1: Acc and dec time 1 2: Acc and dec time 2 3: Acc and dec time 3 4: Acc and dec time 4 bit8-bit15: S curve smoothing parameter 1: Smoothing parameter 1 2: Smoothing parameter 2 3: Smoothing parameter 3 4: Smoothing parameter 4 5: Smoothing parameter 5 6: Smoothing parameter 6 7: Smoothing parameter 7 8: Smoothing parameter 8	256	-	Immediately	"H12_en.22" on page 306
H12.23	2012-18h	Reference 2	–10000 RPM to +10000 RPM	100	rpm	Immediately	"H12_en.23" on page 308
H12.24	2012-19h	Operating time of speed 2	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.24" on page 309
H12.25	2012-1Ah	2nd speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.25" on page 309
H12.26	2012-1Bh	Reference 3	–10000 RPM to +10000 RPM	300	rpm	Immediately	"H12_en.26" on page 309

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H12.27	2012-1Ch	Operating time of speed 3	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.27" on page 310
H12.28	2012-1Dh	3nd speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.28" on page 310
H12.29	2012-1Eh	Reference 4	–10000 RPM to +10000 RPM	500	rpm	Immediately	"H12_en.29" on page 310
H12.30	2012-1Fh	Operating time of speed 4	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.30" on page 310
H12.31	2012-20h	4th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.31" on page 311
H12.32	2012-21h	Reference 5	–10000 RPM to +10000 RPM	700	rpm	Immediately	"H12_en.32" on page 311
H12.33	2012-22h	Operating time of speed 5	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.33" on page 311
H12.34	2012-23h	5th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.34" on page 311
H12.35	2012-24h	Reference 6	–10000 RPM to +10000 RPM	900	rpm	Immediately	"H12_en.35" on page 312
H12.36	2012-25h	Operating time of speed 6	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.36" on page 312

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H12.37	2012-26h	6th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.37" on page 312
H12.38	2012-27h	Reference 7	–10000 RPM to +10000 RPM	600	rpm	Immediately	"H12_en.38" on page 312
H12.39	2012-28h	Operating time of speed 7	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.39" on page 313
H12.40	2012-29h	7th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.40" on page 313
H12.41	2012-2Ah	Reference 8	–10000 RPM to +10000 RPM	300	rpm	Immediately	"H12_en.41" on page 313
H12.42	2012-2Bh	Operating time of speed 8	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.42" on page 314
H12.43	2012-2Ch	8th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.43" on page 314
H12.44	2012-2Dh	Reference 9	–10000 RPM to +10000 RPM	100	rpm	Immediately	"H12_en.44" on page 314
H12.45	2012-2Eh	Operating time of speed 9	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.45" on page 314
H12.46	2012-2Fh	9th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.46" on page 315
H12.47	2012-30h	Reference 10	–10000 RPM to +10000 RPM	-100	rpm	Immediately	"H12_en.47" on page 315

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H12.48	2012-31h	Operating time of speed 10	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.48" on page 315
H12.49	2012-32h	10th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.49" on page 315
H12.50	2012-33h	Reference 11	–10000 RPM to +10000 RPM	-300	rpm	Immediately	"H12_en.50" on page 316
H12.51	2012-34h	Operating time of speed 11	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.51" on page 316
H12.52	2012-35h	11th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.52" on page 316
H12.53	2012-36h	Reference 12	–10000 RPM to +10000 RPM	-500	rpm	Immediately	"H12_en.53" on page 316
H12.54	2012-37h	Operating time of speed 12	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.54" on page 317
H12.55	2012-38h	12th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.55" on page 317
H12.56	2012-39h	Reference 13	–10000 RPM to +10000 RPM	-700	rpm	Immediately	"H12_en.56" on page 317
H12.57	2012-3Ah	Operating time of speed 13	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.57" on page 318

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H12.58	2012-3Bh	13th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.58" on page 318
H12.59	2012-3Ch	Reference 14	–10000 RPM to +10000 RPM	-900	rpm	Immediately	"H12_en.59" on page 318
H12.60	2012-3Dh	Operating time of speed 14	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.60" on page 318
H12.61	2012-3Eh	14th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.61" on page 319
H12.62	2012-3Fh	Reference 15	–10000 RPM to +10000 RPM	-600	rpm	Immediately	"H12_en.62" on page 319
H12.63	2012-40h	Operating time of speed 15	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.63" on page 319
H12.64	2012-41h	15th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.64" on page 319
H12.65	2012-42h	Reference 16	–10000 RPM to +10000 RPM	-300	rpm	Immediately	"H12_en.65" on page 320
H12.66	2012-43h	Operating time of speed 16	0.0s(m) to 6553.5s(m)	5.0	s (m)	Immediately	"H12_en.66" on page 320
H12.67	2012-44h	16th speed rise/drop time and curve smoothing parameter time	See H12.22.	256	-	Immediately	"H12_en.67" on page 320

5.18 Parameter Group H17

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.90	2017-5Bh	Communication VDI enable	0: Disabled 1: Enabled	0	-	At stop	*" H17_en.90" on page 321*
H17.91	2017-5Ch	VDI default value upon power-on	0: No default 1: VDI1 default value 2: VDI2 default value 4: VDI3 default value 8: VDI4 default value 16: VDI5 default value 32: VDI6 default value 64: VDI7 default value 128: VDI8 default value 256: VDI9 default value 512: VDI10 default value 1024: VDI11 default value 2048: VDI12 default value 4096: VDI13 default value 8092: VDI14 default value 16384: VDI15 default value 32768: VDI16 default value	0	-	Immediately	*" H17_en.91" on page 321*
H17.00	2017-01h	VDI1 function selection	See *" H17_en.00" on page 322* for details.	0	-	Immediately	*" H17_en.00" on page 322*
H17.01	2017-02h	VDI1 logic level	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	*" H17_en.01" on page 324*
H17.02	2017-03h	VDI2 function selection	See H17.00.	0	-	Immediately	*" H17_en.02" on page 324*
H17.03	2017-04h	VDI2 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	*" H17_en.03" on page 324*
H17.04	2017-05h	VDI3 function	See H17.00.	0	-	Immediately	*" H17_en.04" on page 324*
H17.05	2017-06h	VDI3 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	*" H17_en.05" on page 325*
H17.06	2017-07h	VDI4 function	See H17.00.	0	-	Immediately	*" H17_en.06" on page 325*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.07	2017-08h	VDI4 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.07" on page 325
H17.08	2017-09h	VDI5 function selection	See H17.00.	0	-	Immediately	"H17_en.08" on page 326
H17.09	2017-0Ah	VDI5 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.09" on page 326
H17.10	2017-0Bh	VDI6 function selection	See H17.00.	0	-	Immediately	"H17_en.10" on page 326
H17.11	2017-0Ch	VDI6 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.11" on page 326
H17.12	2017-0Dh	VDI7 function selection	See H17.00.	0	-	Immediately	"H17_en.12" on page 327
H17.13	2017-0Eh	VDI7 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.13" on page 327
H17.14	2017-0Fh	VDI8 function	See H17.00.	0	-	Immediately	"H17_en.14" on page 327
H17.15	2017-10h	VDI8 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.15" on page 327
H17.16	2017-11h	VDI9 function	See H17.00.	0	-	Immediately	"H17_en.16" on page 328
H17.17	2017-12h	VDI9 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.17" on page 328
H17.18	2017-13h	VDI10 function	See H17.00.	0	-	Immediately	"H17_en.18" on page 328
H17.19	2017-14h	VDI10 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.19" on page 329

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.20	2017-15h	VDI11 function selection	See H17.00.	0	-	Immediately	"H17_en.20" on page 329
H17.21	2017-16h	VDI11 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.21" on page 329
H17.22	2017-17h	VDI12 function	See H17.00.	0	-	Immediately	"H17_en.22" on page 329
H17.23	2017-18h	VDI12 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.23" on page 330
H17.24	2017-19h	VDI13 function	See H17.00.	0	-	Immediately	"H17_en.24" on page 330
H17.25	2017-1Ah	VDI13 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.25" on page 330
H17.26	2017-1Bh	VDI14 function	See H17.00.	0	-	Immediately	"H17_en.26" on page 330
H17.27	2017-1Ch	VDI14 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.27" on page 331
H17.28	2017-1Dh	VDI15 function	See H17.00.	0	-	Immediately	"H17_en.28" on page 331
H17.29	2017-1Eh	VDI15 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.29" on page 331
H17.30	2017-1Fh	VDI16 function	See H17.00.	0	-	Immediately	"H17_en.30" on page 332
H17.31	2017-20h	VDI16 logic level selection	0: Active when the written value is 1 1: Active when the written value changes from 0 to 1	0	-	Immediately	"H17_en.31" on page 332
H17.92	2017-5Dh	Communication VDO enable	0: Disabled 1: Enabled	0	-	At stop	"H17_en.92" on page 332

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.93	2017-5Eh	VDO default value after power-on	0: No default 1: VDO1 default value 2: VDO2 default value 4: VDO3 default value 8: VDO4 default value 16: VDO5 default value 32: VDO6 default value 64: VDO7 default value 128: VDO8 default value 256: VDO9 default value 512: VDO10 default value 1024: VDO11 default value 2048: VDO12 default value 4096: VDO13 default value 8192: VDO14 default value 16384: VDO15 default value 32768: VDO16 default value	0	-	At stop	*" H17_en.93" on page 332*
H17.32	2017-21h	VDO virtual level	0–65535	0	-	Unchangeable	*" H17_en.32" on page 333*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.33	2017-22h	VDO1 function	0: No function 1: Servo ready 2: Motor rotation signal 3: Zero speed signal 4: Speed matching signal 5: Positioning completed 6: Positioning near 7: Torque limited signal 8: Speed limited signal 9: Braking 10: Warning 11: Fault 15: Interrupt positioning completed 16: Homing completed 17: Electrical homing completed 18: Torque reached signal 19: Speed reached signal 21: Enable completed 22: Internal command completed 23: Writing next command allowed 24: Internal motion completed 25: Comparison output 26: Closed-loop state 30: Warning or fault output 31: Communication-forced DO 32: EDM output	0	-	Immediately	"H17_en.33" on page 333
H17.34	2017-23h	VDO1 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	"H17_en.34" on page 334
H17.35	2017-24h	VDO2 function selection	See H17.33.	0	-	Immediately	"H17_en.35" on page 335
H17.36	2017-25h	VDO2 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	"H17_en.36" on page 335
H17.37	2017-26h	VDO3 function	See H17.33.	0	-	Immediately	"H17_en.37" on page 335
H17.38	2017-27h	VDO3 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	"H17_en.38" on page 335
H17.39	2017-28h	VDO4 function	See H17.33.	0	-	Immediately	"H17_en.39" on page 336
H17.40	2017-29h	VDO4 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	"H17_en.40" on page 336
H17.41	2017-2Ah	VDO5 function	See H17.33.	0	-	Immediately	"H17_en.41" on page 336

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.42	2017-2Bh	VDO5 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.42" on page 337
H17.43	2017-2Ch	VDO6 function	See H17.33.	0	-	Immediately	" H17_en.43" on page 337
H17.44	2017-2Dh	VDO6 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.44" on page 337
H17.45	2017-2Eh	VDO7 function	See H17.33.	0	-	Immediately	" H17_en.45" on page 337
H17.46	2017-2Fh	VDO7 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.46" on page 338
H17.47	2017-30h	VDO8 function	See H17.33.	0	-	Immediately	" H17_en.47" on page 338
H17.48	2017-31h	VDO8 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.48" on page 338
H17.49	2017-32h	VDO9 function	See H17.33.	0	-	Immediately	" H17_en.49" on page 338
H17.50	2017-33h	VDO9 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.50" on page 339
H17.51	2017-34h	VDO10 function selection	See H17.33.	0	-	Immediately	" H17_en.51" on page 339
H17.52	2017-35h	VDO10 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.52" on page 339
H17.53	2017-36h	VDO11 function	See H17.33.	0	-	Immediately	" H17_en.53" on page 340
H17.54	2017-37h	VDO11 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.54" on page 340
H17.55	2017-38h	VDO12 function	See H17.33.	0	-	Immediately	" H17_en.55" on page 340
H17.56	2017-39h	VDO12 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.56" on page 340
H17.57	2017-3Ah	VDO13 function	See H17.33.	0	-	Immediately	" H17_en.57" on page 341
H17.58	2017-3Bh	VDO13 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.58" on page 341
H17.59	2017-3Ch	VDO14 function	See H17.33.	0	-	Immediately	" H17_en.59" on page 341
H17.60	2017-3Dh	VDO14 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.60" on page 341
H17.61	2017-3Eh	VDO15 function	See H17.33.	0	-	Immediately	" H17_en.61" on page 342

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H17.62	2017-3Fh	VDO15 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.62" on page 342
H17.63	2017-40h	VDO16 function	See H17.33.	0	-	Immediately	" H17_en.63" on page 342
H17.64	2017-41h	VDO16 logic level	0: Output 1 upon active logic 1: Output 0 upon active logic	0	-	Immediately	" H17_en.64" on page 343

5.19 Parameter Group H18

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H18.00	2018-01h	Position comparison output selection	0: Disable 1: Enable (rising edge-triggered)	0	-	Immediately	" H18_en.00" on page 343
H18.01	2018-02h	Position comparison output feedback source	0: Motor encoder feedback 1: Fully closed-loop position feedback	0	-	Immediately	" H18_en.01" on page 343
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	-	Immediately	" H18_en.02" on page 343
H18.03	2018-04h	Position comparison mode	0: Individual comparison mode 1: Cyclic comparison mode 2: Fixed cyclic comparison mode	0	-	Immediately	" H18_en.03" on page 344
H18.04	2018-05h	Current position as zero	0: Disable 1: Enable (rising edge-triggered)	0	-	Immediately	" H18_en.04" on page 344
H18.05	2018-06h	Position comparison output width	0.1 ms to 204.7 ms	0.1	ms	Immediately	" H18_en.05" on page 345

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H18.06	2018-07h	Position comparison output ABZ port polarity	Bit 0: OCZ output logic 0: Positive, output high level upon active logic 1: Negative, output low level upon active logic Bit 1: Z port output logic 0: Positive, output high level upon active logic 1: Negative, output low level upon active logic bit2: A/B output logic 0: Positive, output high level upon active logic 1: Negative, output low level upon active logic	0	-	Immediately	*" H18_en.06" on page 345*
H18.07	2018-08h	Start point of position comparison	0–40	0	-	Immediately	*" H18_en.07" on page 345*
H18.08	2018-09h	End point of position comparison	0–40	0	-	Immediately	*" H18_en.08" on page 346*
H18.09	2018-0Ah	Current state of position comparison	0–1024	0	-	Unchangeable	*" H18_en.09" on page 346*
H18.10	2018-0Bh	Real-time position of position comparison	-2147483648–2147483647	0	-	Unchangeable	*" H18_en.10" on page 346*
H18.12	2018-0Dh	Zero offset of position comparison	-2147483648–2147483647	0	-	Immediately	*" H18_en.12" on page 346*
H18.14	2018-0Fh	Position comparison output delay compensation	–12.00 µs to 12.00 µs	0.00	us	Immediately	*" H18_en.14" on page 347*
H18.15	2018-10h	Fixed cyclic comparison	1 to 65535	1	-	Immediately	*" H18_en.15" on page 347*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H18.16	2018-11h	ABZ output function setting	bit0: OCZ output function 0: Frequency-division output 1: Position comparison bit1: Z port output function 0: Frequency-division output 1: Position comparison bit2: A/B port output function 0: Frequency-division output 1: Position comparison	0	-	Immediately	" H18_en.16" on page 347
H18.17	2018-12h	Number of fixed mode cycles	0 to 65535	0	-	Unchangeable	" H18_en.17" on page 348

5.20 Parameter Group H19

Parameter	Hexadecimal Parameters	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 348
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: Reserved bit3: Reserved bit4: Reserved bit5: Reserved bit6: Reserved bit7: DO1 output bit8: DO2 output bit9: DO3 output bit10: DO4 output bit11: DO5 output bit12: Frequency-division A output bit13: Frequency-division B output bit14: Frequency-division Z output bit15: Frequency-division OCZ output	0	-	Immediately	" H19_en.02" on page 349

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.03	2019-04h	Target value of position comparison 2	-2147483648 to 2147483647	0	-	Immediately	"H19_en.03" on page 349
H19.05	2019-06h	Attribute value of position comparison 2	See H19.02.	0	-	Immediately	"H19_en.05" on page 350
H19.06	2019-07h	Target value of position comparison 3	-2147483648 to 2147483647	0	-	Immediately	"H19_en.06" on page 350
H19.08	2019-09h	Attribute value of position comparison 3	See H19.02.	0	-	Immediately	"H19_en.08" on page 350
H19.09	2019-0Ah	Target value of position comparison 4	-2147483648 to 2147483647	0	-	Immediately	"H19_en.09" on page 350
H19.11	2019-0Ch	Attribute value of position comparison 4	See H19.02.	0	-	Immediately	"H19_en.11" on page 351
H19.12	2019-0Dh	Target value of position comparison 5	-2147483648 to 2147483647	0	-	Immediately	"H19_en.12" on page 351
H19.14	2019-0Fh	Attribute value of position comparison 5	See H19.02.	0	-	Immediately	"H19_en.14" on page 351
H19.15	2019-10h	Target value of position comparison 6	-2147483648 to 2147483647	0	-	Immediately	"H19_en.15" on page 351
H19.17	2019-12h	Attribute value of position comparison 6	See H19.02.	0	-	Immediately	"H19_en.17" on page 352

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.18	2019-13h	Target value of position comparison 7	-2147483648 to 2147483647	0	-	Immediately	"H19_en.18" on page 352
H19.20	2019-15h	Attribute value of position comparison 7	See H19.02.	0	-	Immediately	"H19_en.20" on page 352
H19.21	2019-16h	Target value of position comparison 8	-2147483648 to 2147483647	0	-	Immediately	"H19_en.21" on page 352
H19.23	2019-18h	Attribute value of position comparison 8	See H19.02.	0	-	Immediately	"H19_en.23" on page 353
H19.24	2019-19h	Target value of position comparison 9	-2147483648 to 2147483647	0	-	Immediately	"H19_en.24" on page 353
H19.26	2019-1Bh	Attribute value of position comparison 9	See H19.02.	0	-	Immediately	"H19_en.26" on page 353
H19.27	2019-1Ch	Target value of position comparison 10	-2147483648 to 2147483647	0	-	Immediately	"H19_en.27" on page 354
H19.29	2019-1Eh	Attribute value of position comparison 10	See H19.02.	0	-	Immediately	"H19_en.29" on page 354
H19.30	2019-1Fh	Target value of position comparison 11	-2147483648 to 2147483647	0	-	Immediately	"H19_en.30" on page 354
H19.32	2019-21h	Attribute value of position comparison 11	See H19.02.	0	-	Immediately	"H19_en.32" on page 354

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.33	2019-22h	Target value of position comparison 12	-2147483648 to 2147483647	0	-	Immediately	"H19_en.33" on page 355
H19.35	2019-24h	Attribute value of position comparison 12	See H19.02.	0	-	Immediately	"H19_en.35" on page 355
H19.36	2019-25h	Target value of position comparison 13	-2147483648 to 2147483647	0	-	Immediately	"H19_en.36" on page 355
H19.38	2019-27h	Attribute value of position comparison 13	See H19.02.	0	-	Immediately	"H19_en.38" on page 355
H19.39	2019-28h	Target value of position comparison 14	-2147483648 to 2147483647	0	-	Immediately	"H19_en.39" on page 356
H19.41	2019-2Ah	Attribute value of position comparison 14	See H19.02.	0	-	Immediately	"H19_en.41" on page 356
H19.42	2019-2Bh	Target value of position comparison 15	-2147483648 to 2147483647	0	-	Immediately	"H19_en.42" on page 356
H19.44	2019-2Dh	Attribute value of position comparison 15	See H19.02.	0	-	Immediately	"H19_en.44" on page 356
H19.45	2019-2Eh	Target value of position comparison 16	-2147483648 to 2147483647	0	-	Immediately	"H19_en.45" on page 357
H19.47	2019-30h	Attribute value of position comparison 16	See H19.02.	0	-	Immediately	"H19_en.47" on page 357

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.48	2019-31h	Target value of position comparison 17	-2147483648 to 2147483647	0	-	Immediately	"H19_en.48" on page 357
H19.50	2019-33h	Attribute value of position comparison 17	See H19.02.	0	-	Immediately	"H19_en.50" on page 358
H19.51	2019-34h	Target value of position comparison 18	-2147483648 to 2147483647	0	-	Immediately	"H19_en.51" on page 358
H19.53	2019-36h	Attribute value of position comparison 18	See H19.02.	0	-	Immediately	"H19_en.53" on page 358
H19.54	2019-37h	Target value of position comparison 19	-2147483648 to 2147483647	0	-	Immediately	"H19_en.54" on page 358
H19.56	2019-39h	Attribute value of position comparison 19	See H19.02.	0	-	Immediately	"H19_en.56" on page 359
H19.57	2019-3Ah	Target value of position comparison 20	-2147483648 to 2147483647	0	-	Immediately	"H19_en.57" on page 359
H19.59	2019-3Ch	Attribute value of position comparison 20	See H19.02.	0	-	Immediately	"H19_en.59" on page 359
H19.60	2019-3Dh	Target value of position comparison 21	-2147483648 to 2147483647	0	-	Immediately	"H19_en.60" on page 359
H19.62	2019-3Fh	Attribute value of position comparison 21	See H19.02.	0	-	Immediately	"H19_en.62" on page 360

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.63	2019-40h	Target value of position comparison 22	-2147483648 to 2147483647	0	-	Immediately	"H19_en.63" on page 360
H19.65	2019-42h	Attribute value of position comparison 22	See H19.02.	0	-	Immediately	"H19_en.65" on page 360
H19.66	2019-43h	Target value of position comparison 23	-2147483648 to 2147483647	0	-	Immediately	"H19_en.66" on page 360
H19.68	2019-45h	Attribute value of position comparison 23	See H19.02.	0	-	Immediately	"H19_en.68" on page 361
H19.69	2019-46h	Target value of position comparison 24	-2147483648 to 2147483647	0	-	Immediately	"H19_en.69" on page 361
H19.71	2019-48h	Attribute value of position comparison 24	See H19.02.	0	-	Immediately	"H19_en.71" on page 361
H19.72	2019-49h	Target value of position comparison 25	-2147483648 to 2147483647	0	-	Immediately	"H19_en.72" on page 362
H19.74	2019-4Bh	Attribute value of position comparison 25	See H19.02.	0	-	Immediately	"H19_en.74" on page 362
H19.75	2019-4Ch	Target value of position comparison 26	-2147483648 to 2147483647	0	-	Immediately	"H19_en.75" on page 362
H19.77	2019-4Eh	Attribute value of position comparison 26	See H19.02.	0	-	Immediately	"H19_en.77" on page 362

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.78	2019-4Fh	Target value of position comparison 27	-2147483648 to 2147483647	0	-	Immediately	"H19_en.78" on page 363
H19.80	2019-51h	Attribute value of position comparison 27	See H19.02.	0	-	Immediately	"H19_en.80" on page 363
H19.81	2019-52h	Target value of position comparison 28	-2147483648 to 2147483647	0	-	Immediately	"H19_en.81" on page 363
H19.83	2019-54h	Attribute value of position comparison 28	See H19.02.	0	-	Immediately	"H19_en.83" on page 363
H19.84	2019-55h	Target value of position comparison 29	-2147483648 to 2147483647	0	-	Immediately	"H19_en.84" on page 364
H19.86	2019-57h	Attribute value of position comparison 29	See H19.02.	0	-	Immediately	"H19_en.86" on page 364
H19.87	2019-58h	Target value of position comparison 30	-2147483648 to 2147483647	0	-	Immediately	"H19_en.87" on page 364
H19.89	2019-5Ah	Attribute value of position comparison 30	See H19.02.	0	-	Immediately	"H19_en.89" on page 364
H19.90	2019-5Bh	Target value of position comparison 31	-2147483648 to 2147483647	0	-	Immediately	"H19_en.90" on page 365
H19.92	2019-5Dh	Attribute value of position comparison 31	See H19.02.	0	-	Immediately	"H19_en.92" on page 365

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.93	2019-5Eh	Target value of position comparison 32	-2147483648 to 2147483647	0	-	Immediately	" H19_en.93" on page 365
H19.95	2019-60h	Attribute value of position comparison 32	See H19.02.	0	-	Immediately	" H19_en.95" on page 366
H19.96	2019-61h	Target value of position comparison 33	-2147483648 to 2147483647	0	-	Immediately	" H19_en.96" on page 366
H19.98	2019-63h	Attribute value of position comparison 33	See H19.02.	0	-	Immediately	" H19_en.98" on page 366
H19.99	2019-64h	Target value of position comparison 34	-2147483648 to 2147483647	0	-	Immediately	" H19_en.99" on page 366
H19.101	2019-66h	Attribute value of position comparison 34	See H19.02.	0	-	Immediately	" H19_en.101" on page 367
H19.102	2019-67h	Target value of position comparison 35	-2147483648 to 2147483647	0	-	Immediately	" H19_en.102" on page 367
H19.104	2019-69h	Attribute value of position comparison 35	See H19.02.	0	-	Immediately	" H19_en.104" on page 367
H19.105	2019-6Ah	Target value of position comparison 36	-2147483648 to 2147483647	0	-	Immediately	" H19_en.105" on page 367
H19.107	2019-6Ch	Attribute value of position comparison 36	See H19.02.	0	-	Immediately	" H19_en.107" on page 368

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H19.108	2019-6Dh	Target value of position comparison 37	-2147483648 to 2147483647	0	-	Immediately	" H19_en.108" on page 368
H19.110	2019-6Fh	Attribute value of position comparison 37	See H19.02.	0	-	Immediately	" H19_en.110" on page 368
H19.111	2019-70h	Target value of position comparison 38	-2147483648 to 2147483647	0	-	Immediately	" H19_en.111" on page 368
H19.113	2019-72h	Attribute value of position comparison 38	See H19.02.	0	-	Immediately	" H19_en.113" on page 369
H19.114	2019-73h	Target value of position comparison 39	-2147483648 to 2147483647	0	-	Immediately	" H19_en.114" on page 369
H19.116	2019-75h	Attribute value of position comparison 39	See H19.02.	0	-	Immediately	" H19_en.116" on page 369
H19.117	2019-76h	Target value of position comparison 40	-2147483648 to 2147483647	0	-	Immediately	" H19_en.117" on page 370
H19.119	2019-78h	Attribute value of position comparison 40	See H19.02.	0	-	Immediately	" H19_en.119" on page 370

5.21 Parameter Group H1F

Parameter	Hexadecimal Parameters	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 370*
H1F.91	201F-5Ch	DI function state 2 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.91" on page 371*
H1F.92	201F-5Dh	DI function state 3 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.92" on page 371*
H1F.93	201F-5Eh	DI function state 4 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.93" on page 371*
H1F.94	201F-5Fh	DO function state 1 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.94" on page 372*
H1F.95	201F-60h	DO function state 2 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.95" on page 372*
H1F.96	201F-61h	DO function state 3 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.96" on page 372*
H1F.97	201F-62h	DO function state 4 read through communication	0–65535	0	-	Unchangeable	*" H1F_en.97" on page 373*

5.22 Parameter Group H22

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H22.00	2022-01h	Process segment command trigger	0 to 1000	0	-	Immediately	*" H22_en.00" on page 373*
H22.01	2022-02h	Process segment triggered by the event rising edge	0 to 65535	0	-	Immediately	*" H22_en.01" on page 374*
H22.02	2022-03h	Process segment triggered by the event falling edge	0 to 65535	0	-	Immediately	*" H22_en.02" on page 374*
H22.03	2022-04h	Acceleration/ Deceleration time upon technology segment pause	0: Acceleration/Deceleration time 1: Acceleration/Deceleration time 1 2: Acceleration/Deceleration time 2 3: Acceleration/Deceleration time 3 4: Acceleration/Deceleration time 4 5: Acceleration/Deceleration time 5 6: Acceleration/Deceleration time 6 7: Acceleration/Deceleration time 7	0	-	Immediately	*" H22_en.03" on page 375*
H22.04	2022-05h	Positive software position limit	-2147483648 to 2147483647	2147483647	Reference unit	Immediately	*" H22_en.04" on page 376*
H22.06	2022-07h	Negative software position limit	-2147483648 to 2147483647	-2147483648	Reference unit	Immediately	*" H22_en.06" on page 376*
H22.08	2022-09h	Process segment number	0 to 65535	0	-	Unchangeable	*" H22_en.08" on page 376*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H22.09	2022-0Ah	Process segment function switch	0 to 65535	0	-	At stop	*" H22_en.09" on page 377*
H22.19	2022-14h	Target speed	0.1 rpm to 6000.0 rpm	50.0	rpm	Immediately	*" H22_en.19" on page 377*
H22.20	2022-15h	Target speed 1	0.1 rpm to 6000.0 rpm	200.0	rpm	Immediately	*" H22_en.20" on page 377*
H22.21	2022-16h	Target speed 2	0.1 rpm to 6000.0 rpm	500.0	rpm	Immediately	*" H22_en.21" on page 377*
H22.22	2022-17h	Target speed 3	0.1 rpm to 6000.0 rpm	1000.0	rpm	Immediately	*" H22_en.22" on page 378*
H22.23	2022-18h	Target speed 4	0.1 rpm to 6000.0 rpm	1500.0	rpm	Immediately	*" H22_en.23" on page 378*
H22.24	2022-19h	Target speed 5	0.1 rpm to 6000.0 rpm	2000.0	rpm	Immediately	*" H22_en.24" on page 378*
H22.25	2022-1Ah	Target speed 6	0.1 rpm to 6000.0 rpm	2500.0	rpm	Immediately	*" H22_en.25" on page 379*
H22.26	2022-1Bh	Target speed 7	0.1 rpm to 6000.0 rpm	3000.0	rpm	Immediately	*" H22_en.26" on page 379*
H22.35	2022-24h	Acceleration/ Deceleration time	0 ms to 65535 ms	50	ms	Immediately	*" H22_en.35" on page 379*
H22.36	2022-25h	Acceleration/ Deceleration time 1	0 ms to 65535 ms	200	ms	Immediately	*" H22_en.36" on page 379*
H22.37	2022-26h	Acceleration/ Deceleration time 2	0 ms to 65535 ms	500	ms	Immediately	*" H22_en.37" on page 380*
H22.38	2022-27h	Acceleration/ Deceleration time 3	0 ms to 65535 ms	1000	ms	Immediately	*" H22_en.38" on page 380*
H22.39	2022-28h	Acceleration/ Deceleration time 4	0 ms to 65535 ms	1500	ms	Immediately	*" H22_en.39" on page 380*
H22.40	2022-29h	Acceleration/ Deceleration time 5	0 ms to 65535 ms	2000	ms	Immediately	*" H22_en.40" on page 380*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H22.41	2022-2Ah	Acceleration/ Deceleration time 6	0 ms to 65535 ms	2500	ms	Immediately	" H22_en.41" on page 381
H22.42	2022-2Bh	Acceleration/ Deceleration time 7	0 ms to 65535 ms	3000	ms	Immediately	" H22_en.42" on page 381
H22.51	2022-34h	Delay after completion of the process segment	0 ms to 65535 ms	0	ms	Immediately	" H22_en.51" on page 381
H22.52	2022-35h	Delay time 1 after completion of the process segment	0 ms to 65535 ms	50	ms	Immediately	" H22_en.52" on page 382
H22.53	2022-36h	Delay time 2 after completion of the process segment	0 ms to 65535 ms	200	ms	Immediately	" H22_en.53" on page 382
H22.54	2022-37h	Delay time 3 after completion of the process segment	0 ms to 65535 ms	500	ms	Immediately	" H22_en.54" on page 382
H22.55	2022-38h	Delay time 4 after completion of the process segment	0 ms to 65535 ms	1000	ms	Immediately	" H22_en.55" on page 382
H22.56	2022-39h	Delay time 5 after completion of the process segment	0 ms to 65535 ms	1500	ms	Immediately	" H22_en.56" on page 383

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H22.57	2022-3Ah	Delay time 6 after completion of the process segment	0 ms to 65535 ms	2000	ms	Immediately	" H22_en.57" on page 383
H22.58	2022-3Bh	Delay time 7 after completion of the process segment	0 ms to 65535 ms	3000	ms	Immediately	" H22_en.58" on page 383
H22.70	2022-47h	Homing mode	-32768 to 32767	-2	-	Immediately	" H22_en.70" on page 384
H22.71	2022-48h	Speed in high-speed searching for the home switch signal	0 rpm to 3000 rpm	100	rpm	Immediately	" H22_en.71" on page 384
H22.72	2022-49h	Speed in low-speed searching for the home switch signal	0 rpm to 1000 rpm	10	rpm	Immediately	" H22_en.72" on page 384
H22.73	2022-4Ah	Acceleration/ Deceleration time during homing	0 ms to 1000 ms	1000	ms	Immediately	" H22_en.73" on page 385
H22.74	2022-4Bh	Home search time limit	0 ms to 65535 ms	10000	ms	Immediately	" H22_en.74" on page 385
H22.75	2022-4Ch	Mechanical home offset	-2147483648 to 2147483647	0	Reference unit	Immediately	" H22_en.75" on page 385
H22.79	2022-50h	Relative/ Absolute homing	0 to 65535	0	-	Immediately	" H22_en.79" on page 385

5.23 Parameter Group H23

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H23.00	2023-01h	Definition of homing	0–4294967295	0	-	Immediately	*" H23_en.00" on page 386*
H23.02	2023-03h	Homing data	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.02" on page 386*
H23.04	2023-05h	Definition of process segment 1	0 to 4294967295	0	-	Immediately	*" H23_en.04" on page 386*
H23.06	2023-07h	Data of process segment 1	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.06" on page 387*
H23.08	2023-09h	Definition of process segment 2	0 to 4294967295	0	-	Immediately	*" H23_en.08" on page 387*
H23.10	2023-0Bh	Data of process segment 2	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.10" on page 387*
H23.12	2023-0Dh	Definition of process segment 3	0 to 4294967295	0	-	Immediately	*" H23_en.12" on page 388*
H23.14	2023-0Fh	Data of process segment 3	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.14" on page 388*
H23.16	2023-11h	Definition of process segment 4	0 to 4294967295	0	-	Immediately	*" H23_en.16" on page 388*
H23.18	2023-13h	Data of process segment 4	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.18" on page 388*
H23.20	2023-15h	Definition of process segment 5	0 to 4294967295	0	-	Immediately	*" H23_en.20" on page 389*
H23.22	2023-17h	Data of process segment 5	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.22" on page 389*
H23.24	2023-19h	Definition of process segment 6	0 to 4294967295	0	-	Immediately	*" H23_en.24" on page 389*
H23.26	2023-1Bh	Data of process segment 6	-2147483648 to 2147483647	0	-	Immediately	*" H23_en.26" on page 390*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H23.28	2023-1Dh	Definition of process segment 7	0 to 4294967295	0	-	Immediately	" H23_en.28" on page 390
H23.30	2023-1Fh	Data of process segment 7	-2147483648 to 2147483647	0	-	Immediately	" H23_en.30" on page 390
H23.32	2023-21h	Definition of process segment 8	0 to 4294967295	0	-	Immediately	" H23_en.32" on page 390
H23.34	2023-23h	Data of process segment 8	-2147483648 to 2147483647	0	-	Immediately	" H23_en.34" on page 391
H23.36	2023-25h	Definition of process segment 9	0 to 4294967295	0	-	Immediately	" H23_en.36" on page 391
H23.38	2023-27h	Data of process segment 9	-2147483648 to 2147483647	0	-	Immediately	" H23_en.38" on page 391
H23.40	2023-29h	Definition of process segment 10	0 to 4294967295	0	-	Immediately	" H23_en.40" on page 391
H23.42	2023-2Bh	Data of process segment 10	-2147483648 to 2147483647	0	-	Immediately	" H23_en.42" on page 392
H23.44	2023-2Dh	Definition of process segment 11	0 to 4294967295	0	-	Immediately	" H23_en.44" on page 392
H23.46	2023-2Fh	Data of process segment 11	-2147483648 to 2147483647	0	-	Immediately	" H23_en.46" on page 392
H23.48	2023-31h	Definition of process segment 12	0 to 4294967295	0	-	Immediately	" H23_en.48" on page 393
H23.50	2023-33h	Data of process segment 12	-2147483648 to 2147483647	0	-	Immediately	" H23_en.50" on page 393
H23.52	2023-35h	Definition of process segment 13	0 to 4294967295	0	-	Immediately	" H23_en.52" on page 393
H23.54	2023-37h	Data of process segment 13	-2147483648 to 2147483647	0	-	Immediately	" H23_en.54" on page 393

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H23.56	2023-39h	Definition of process segment 14	0 to 4294967295	0	-	Immediately	" H23_en.56" on page 394
H23.58	2023-3Bh	Data of process segment 14	-2147483648 to 2147483647	0	-	Immediately	" H23_en.58" on page 394
H23.60	2023-3Dh	Definition of process segment 15	0 to 4294967295	0	-	Immediately	" H23_en.60" on page 394
H23.62	2023-3Fh	Data of process segment 15	-2147483648 to 2147483647	0	-	Immediately	" H23_en.62" on page 394

5.24 Parameter Group H30

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 395
H30.01	2030-02h	DO function state 1 read through communication	0–65535	0	-	Unchangeable	" H30_en.01" on page 395
H30.02	2030-03h	DO function state 2 read through communication	0–65535	0	-	Unchangeable	" H30_en.02" on page 396
H30.03	2030-04h	Input pulse reference sampling value read through communication	0–65535	0	-	Unchangeable	" H30_en.03" on page 396

5.25 Parameter Group H31

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
H31.00	2031-01h	VDI virtual level set through communication	0–65535	0	-	Immediately	*" H31_en.00" on page 396*
H31.01	2031-02h	Frequency-division output frequency set through communication	0 Hz–16000000 Hz	0	Hz	Immediately	*" H31_en.01" on page 397*
H31.04	2031-05h	DO state set through communication	0–65535	0	-	Immediately	*" H31_en.04" on page 397*
H31.05	2031-06h	AO set through communication	-10000 mV to 10000 mV	0	mV	Immediately	*" H31_en.05" on page 397*
H31.09	2031-0Ah	Speed reference set through communication	–10000.000 RPM to 10000.000 RPM	0.000	rpm	Immediately	*" H31_en.09" on page 398*
H31.11	2031-0Ch	Torque reference set through communication	-100.000% to 100.000%	0.000	%	Immediately	*" H31_en.11" on page 398*

5.26 Parameter Group 1000h

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1005h	1005h	SYNC message COB-ID	128 to 4294967295	128	-	Immediately	*"1005h" on page 398*
1006h	1006h	Synchronization cycle	0us–2147483647us	0	us	Immediately	*"1006h" on page 399*
100Ch	100Ch	Node guarding time	0 ms to 65535 ms	0	ms	Immediately	*"100Ch" on page 399*
100dh	100dh	Life factor	0 to 255	0	-	Immediately	*"100dh" on page 399*
1014h	1014h	Emergency message COB-ID	0 to 4294967295	0	-	Immediately	*"1014h" on page 399*
1016.01h	1016-01h	Consumer heartbeat time 1	0 to 2147483647	0	-	Immediately	*"1016_en.01h" on page 400*
1016.02h	1016-02h	Consumer heartbeat time 2	0 to 2147483647	0	-	Immediately	*"1016_en.02h" on page 400*
1016.03h	1016-03h	Consumer heartbeat time 3	0 to 2147483647	0	-	Immediately	*"1016_en.03h" on page 401*
1016.04h	1016-04h	Consumer heartbeat time 4	0 to 2147483647	0	-	Immediately	*"1016_en.04h" on page 401*
1016.05h	1016-05h	Consumer heartbeat time 5	0 to 2147483647	0	-	Immediately	*"1016_en.05h" on page 401*
1017h	1017h	Producer heartbeat time	0 ms to 65535 ms	0	ms	Immediately	*"1017h" on page 401*
1400.01h	1400-01h	COB-ID of RPDO1	0 to 4294967295	512	-	Immediately	*"1400_en.01h" on page 402*
1400.02h	1400-02h	Transmission type of RPDO1	0 to 255	255	-	Immediately	*"1400_en.02h" on page 402*
1401.01h	1401-01h	COB-ID of RPDO2	0 to 4294967295	0	-	Immediately	*"1401_en.01h" on page 402*
1401.02h	1401-02h	Transmission type of RPDO2	0 to 255	255	-	Immediately	*"1401_en.02h" on page 403*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1402.01h	1402-01h	COB-ID of RPDO3	0 to 4294967295	0	-	Immediately	" 1402_en.01h" on page 403
1402.02h	1402-02h	Transmission type of RPDO3	0 to 255	255	-	Immediately	" 1402_en.02h" on page 403
1403.01h	1403-01h	COB-ID of RPDO4	0 to 4294967295	0	-	Immediately	" 1403_en.01h" on page 403
1403.02h	1403-02h	Transmission type of RPDO4	0 to 255	255	-	Immediately	" 1403_en.02h" on page 404
1600.00h	1600-00h	Number of valid mapped objects in RPDO1	0 to 8	1	-	Immediately	" 1600_en.00h" on page 404
1600.01h	1600-01h	Mapping object 1 of RPDO1	0 to 2147483647	1614807056	-	Immediately	" 1600_en.01h" on page 404
1600.02h	1600-02h	Mapping object 2 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.02h" on page 405
1600.03h	1600-03h	Mapping object 3 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.03h" on page 405
1600.04h	1600-04h	Mapping object 4 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.04h" on page 405
1600.05h	1600-05h	Mapping object 5 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.05h" on page 406
1600.06h	1600-06h	Mapping object 6 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.06h" on page 406
1600.07h	1600-07h	Mapping object 7 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.07h" on page 406
1600.08h	1600-08h	Mapping object 8 of RPDO1	0 to 2147483647	0	-	Immediately	" 1600_en.08h" on page 406
1601.00h	1601-00h	Number of valid mapped objects in RPDO2	0 to 8	2	-	Immediately	" 1601_en.00h" on page 407

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1601.01h	1601-01h	Mapping object 1 of RPDO2	0 to 2147483647	1614807056	-	Immediately	" 1601_en.01h" on page 407
1601.02h	1601-02h	Mapping object 2 of RPDO2	0 to 2147483647	1616904200	-	Immediately	" 1601_en.02h" on page 407
1601.03h	1601-03h	Mapping object 3 of RPDO2	0 to 2147483647	0	-	Immediately	" 1601_en.03h" on page 408
1601.04h	1601-04h	Mapping object 4 of RPDO2	0 to 2147483647	0	-	Immediately	" 1601_en.04h" on page 408
1601.05h	1601-05h	Mapping object 5 of RPDO2	0 to 2147483647	0	-	Immediately	" 1601_en.05h" on page 408
1601.06h	1601-06h	Mapping object 6 of RPDO2	0 to 2147483647	0	-	Immediately	" 1601_en.06h" on page 408
1601.07h	1601-07h	Mapping object 7 of RPDO2	0 to 2147483647	0	-	Immediately	" 1601_en.07h" on page 409
1601.08h	1601-08h	Mapping object 8 of RPDO2	0 to 2147483647	0	-	Immediately	" 1601_en.08h" on page 409
1602.00h	1602-00h	Number of valid mapped objects in RPDO3	0 to 8	2	-	Immediately	" 1602_en.00h" on page 409
1602.01h	1602-01h	Mapping object 1 of RPDO3	0 to 2147483647	1614807056	-	Immediately	" 1602_en.01h" on page 410
1602.02h	1602-02h	Mapping object 2 of RPDO3	0 to 2147483647	1618608160	-	Immediately	" 1602_en.02h" on page 410
1602.03h	1602-03h	Mapping object 3 of RPDO3	0 to 2147483647	0	-	Immediately	" 1602_en.03h" on page 410
1602.04h	1602-04h	Mapping object 4 of RPDO3	0 to 2147483647	0	-	Immediately	" 1602_en.04h" on page 411
1602.05h	1602-05h	Mapping object 5 of RPDO3	0 to 2147483647	0	-	Immediately	" 1602_en.05h" on page 411

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1602.06h	1602-06h	Mapping object 6 of RPDO3	0 to 2147483647	0	-	Immediately	*" 1602_en.06h" on page 411*
1602.07h	1602-07h	Mapping object 7 of RPDO3	0 to 2147483647	0	-	Immediately	*" 1602_en.07h" on page 411*
1602.08h	1602-08h	Mapping object 8 of RPDO3	0 to 2147483647	0	-	Immediately	*" 1602_en.08h" on page 412*
1603.00h	1603-00h	Number of valid mapped objects in RPDO4	0 to 8	2	-	Immediately	*" 1603_en.00h" on page 412*
1603.01h	1603-01h	Mapping object 1 of RPDO4	0 to 2147483647	1614807056	-	Immediately	*" 1603_en.01h" on page 412*
1603.02h	1603-02h	Mapping object 2 of RPDO4	0 to 2147483647	1627324448	-	Immediately	*" 1603_en.02h" on page 413*
1603.03h	1603-03h	Mapping object 3 of RPDO4	0 to 2147483647	0	-	Immediately	*" 1603_en.03h" on page 413*
1603.04h	1603-04h	Mapping object 4 of RPDO4	0 to 2147483647	0	-	Immediately	*" 1603_en.04h" on page 413*
1603.05h	1603-05h	Mapping object 5 of RPDO4	0 to 2147483647	0	-	Immediately	*" 1603_en.05h" on page 413*
1603.06h	1603-06h	Mapping object 6 of RPDO4	0 to 2147483647	0	-	Immediately	*" 1603_en.06h" on page 414*
1603.07h	1603-07h	Mapping object 7 of RPDO4	0 to 2147483647	0	-	Immediately	*" 1603_en.07h" on page 414*
1603.08h	1603-08h	Mapping object 8 of RPDO4	0 to 2147483647	0	-	Immediately	*" 1603_en.08h" on page 414*
1800.01h	1800-01h	COB-ID of TPDO1	0 to 4294967295	0	-	Immediately	*" 1800_en.01h" on page 414*
1800.02h	1800-02h	Transmission type of TPDO1	0 to 255	255	-	Immediately	*" 1800_en.02h" on page 415*
1800.03h	1800-03h	Inhibit time of TPDO1	0 us to 65535 us	500	100us	Immediately	*" 1800_en.03h" on page 415*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1800.05h	1800-05h	Event counter of TPDO1	0 ms to 65535 ms	0	ms	Immediately	" 1800_en.05h" on page 416
1801.01h	1801-01h	COB-ID of TPDO2	0 to 4294967295	0	-	Immediately	" 1801_en.01h" on page 416
1801.02h	1801-02h	Transmission type of TPDO2	0 to 255	255	-	Immediately	" 1801_en.02h" on page 416
1801.03h	1801-03h	Inhibit time of TPDO2	0 us to 65535 us	500	100us	Immediately	" 1801_en.03h" on page 416
1801.05h	1801-05h	Event counter of TPDO2	0 ms to 65535 ms	0	ms	Immediately	" 1801_en.05h" on page 417
1802.01h	1802-01h	COB-ID of TPDO3	0 to 4294967295	0	-	Immediately	" 1802_en.01h" on page 417
1802.02h	1802-02h	Transmission type of TPDO3	0 to 255	255	-	Immediately	" 1802_en.02h" on page 417
1802.03h	1802-03h	Inhibit time of TPDO3	0 us to 65535 us	500	100us	Immediately	" 1802_en.03h" on page 418
1802.05h	1802-05h	Event counter of TPDO3	0 ms to 65535 ms	0	ms	Immediately	" 1802_en.05h" on page 418
1803.01h	1803-01h	COB-ID of TPDO4	0 to 4294967295	0	-	Immediately	" 1803_en.01h" on page 418
1803.02h	1803-02h	Transmission type of TPDO4	0 to 255	255	-	Immediately	" 1803_en.02h" on page 418
1803.03h	1803-03h	Inhibit time of TPDO4	0 us to 65535 us	500	100us	Immediately	" 1803_en.03h" on page 419
1803.05h	1803-05h	Event counter of TPDO4	0 ms to 65535 ms	0	ms	Immediately	" 1803_en.05h" on page 419
1A00.00h	1A00-00h	Number of valid mapped objects in TPDO1	0 to 8	1	-	Immediately	" 1A00_en.00h" on page 419
1A00.01h	1A00-01h	Mapping object 1 of TPDO1	0 to 2147483647	1614872592	-	Immediately	" 1A00_en.01h" on page 419
1A00.02h	1A00-02h	Mapping object 2 of TPDO1	0 to 2147483647	0	-	Immediately	" 1A00_en.02h" on page 420

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1A00.03h	1A00-03h	Mapping object 3 of TPDO1	0 to 2147483647	0	-	Immediately	*" 1A00_en.03h" on page 420*
1A00.04h	1A00-04h	Mapping object 4 of TPDO1	0 to 2147483647	0	-	Immediately	*" 1A00_en.04h" on page 420*
1A00.05h	1A00-05h	Mapping object 5 of TPDO1	0 to 2147483647	0	-	Immediately	*" 1A00_en.05h" on page 421*
1A00.06h	1A00-06h	Mapping object 6 of TPDO1	0 to 2147483647	0	-	Immediately	*" 1A00_en.06h" on page 421*
1A00.07h	1A00-07h	Mapping object 7 of TPDO1	0 to 2147483647	0	-	Immediately	*" 1A00_en.07h" on page 421*
1A00.08h	1A00-08h	Mapping object 8 of TPDO1	0 to 2147483647	0	-	Immediately	*" 1A00_en.08h" on page 421*
1A01.00h	1A01-00h	Number of valid mapped objects in TPDO2	0 to 8	2	-	Immediately	*" 1A01_en.00h" on page 422*
1A01.01h	1A01-01h	Mapping object 1 of TPDO2	0 to 2147483647	1614872592	-	Immediately	*" 1A01_en.01h" on page 422*
1A01.02h	1A01-02h	Mapping object 2 of TPDO2	0 to 2147483647	1616969736	-	Immediately	*" 1A01_en.02h" on page 422*
1A01.03h	1A01-03h	Mapping object 3 of TPDO2	0 to 2147483647	0	-	Immediately	*" 1A01_en.03h" on page 423*
1A01.04h	1A01-04h	Mapping object 4 of TPDO2	0 to 2147483647	0	-	Immediately	*" 1A01_en.04h" on page 423*
1A01.05h	1A01-05h	Mapping object 5 of TPDO2	0 to 2147483647	0	-	Immediately	*" 1A01_en.05h" on page 423*
1A01.06h	1A01-06h	Mapping object 6 of TPDO2	0 to 2147483647	0	-	Immediately	*" 1A01_en.06h" on page 424*
1A01.07h	1A01-07h	Mapping object 7 of TPDO2	0 to 2147483647	0	-	Immediately	*" 1A01_en.07h" on page 424*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1A01.08h	1A01-08h	Mapping object 8 of TPDO2	0 to 2147483647	0	-	Immediately	" 1A01_en.08h" on page 424
1A02.00h	1A02-00h	Number of valid mapped objects in TPDO3	0 to 8	2	-	Immediately	" 1A02_en.00h" on page 424
1A02.01h	1A02-01h	Mapping object 1 of TPDO3	0 to 2147483647	1614872592	-	Immediately	" 1A02_en.01h" on page 425
1A02.02h	1A02-02h	Mapping object 2 of TPDO3	0 to 2147483647	1617166368	-	Immediately	" 1A02_en.02h" on page 425
1A02.03h	1A02-03h	Mapping object 3 of TPDO3	0 to 2147483647	0	-	Immediately	" 1A02_en.03h" on page 425
1A02.04h	1A02-04h	Mapping object 4 of TPDO3	0 to 2147483647	0	-	Immediately	" 1A02_en.04h" on page 426
1A02.05h	1A02-05h	Mapping object 5 of TPDO3	0 to 2147483647	0	-	Immediately	" 1A02_en.05h" on page 426
1A02.06h	1A02-06h	Mapping object 6 of TPDO3	0 to 2147483647	0	-	Immediately	" 1A02_en.06h" on page 426
1A02.07h	1A02-07h	Mapping object 7 of TPDO3	0 to 2147483647	0	-	Immediately	" 1A02_en.07h" on page 426
1A02.08h	1A02-08h	Mapping object 8 of TPDO3	0 to 2147483647	0	-	Immediately	" 1A02_en.08h" on page 427
1A03.00h	1A03-00h	Number of valid mapped objects in TPDO4	0 to 8	2	-	Immediately	" 1A03_en.00h" on page 427
1A03.01h	1A03-01h	Mapping object 1 of TPDO4	0 to 2147483647	1614872592	-	Immediately	" 1A03_en.01h" on page 427
1A03.02h	1A03-02h	Mapping object 2 of TPDO4	0 to 2147483647	1617690656	-	Immediately	" 1A03_en.02h" on page 428

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
1A03.03h	1A03-03h	Mapping object 3 of TPDO4	0 to 2147483647	0	-	Immediately	*" 1A03_en.03h" on page 428*
1A03.04h	1A03-04h	Mapping object 4 of TPDO4	0 to 2147483647	0	-	Immediately	*" 1A03_en.04h" on page 428*
1A03.05h	1A03-05h	Mapping object 5 of TPDO4	0 to 2147483647	0	-	Immediately	*" 1A03_en.05h" on page 428*
1A03.06h	1A03-06h	Mapping object 6 of TPDO4	0 to 2147483647	0	-	Immediately	*" 1A03_en.06h" on page 429*
1A03.07h	1A03-07h	Mapping object 7 of TPDO4	0 to 2147483647	0	-	Immediately	*" 1A03_en.07h" on page 429*
1A03.08h	1A03-08h	Mapping object 8 of TPDO4	0 to 2147483647	0	-	Immediately	*" 1A03_en.08h" on page 429*

5.27 Parameter Group 6000h

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
603Fh	603Fh	Error Code	0 to 65535	0	-	Unchangeable	*" 603Fh" on page 430*
6040h	6040h	Control word	0 to 65535	0	-	Immediately	*" 6040h" on page 430*
6041h	6041h	Status word	0 to 65535	0	-	Unchangeable	*" 6041h" on page 430*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
605Ah	605Ah	Quick stop option code	0: Coast to stop, keeping de-energized state 1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state 2: Ramp to stop as defined by 6085h, keeping de-energized state 3: Stop at emergency stop torque, keeping de-energized state 5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state 6: Ramp to stop as defined by 6085h, keeping position lock state 7: Stop at emergency stop torque, keeping position lock state	2	-	At stop	*" 605Ah" on page 431*
605Ch	605Ch	Stop mode at S-OFF	–4: Ramp to stop as defined by 6085h, keeping dynamic braking state –3: Stop at zero speed, keeping dynamic braking state –2: Ramp to stop as defined by 6084h/ 609Ah, keeping dynamic braking state –1: Dynamic braking stop, keeping dynamic braking state 0: Coast to stop, keeping de-energized state 1: Ramp to stop as defined by 6084h/ 609Ah, keeping de-energized state 2: Dynamic braking stop, keeping de-energized state	0	-	At stop	*" 605Ch" on page 431*
605Dh	605Dh	Stop option code	1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state 2: Ramp to stop as defined by 6085h, keeping position lock state 3: Stop at emergency stop torque, keeping position lock state	1	-	At stop	*" 605Dh" on page 432*

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
605Eh	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 432
6060h	6060h	Modes of operation	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Immediately	" 6060h" on page 433
6061h	6061h	Operation mode display	1: Profile position mode (pp) 3 Profile velocity mode (pv) 4 Profile torque mode (pt) Homing mode (hm) 7: Interpolation mode (ip)	0	-	Unchangeable	" 6061h" on page 434
6062h	6062h	Position reference	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 6062h" on page 434
6063h	6063h	Position actual value	–2147483648 to +2147483647	0	Pulse	Unchangeable	" 6063h" on page 435
6064h	6064h	Position actual value	-2147483648 to 2147483647	0	Reference unit	Unchangeable	" 6064h" on page 435
6065h	6065h	Following error window	0 to 4294967295	27486951	Reference unit	Immediately	" 6065h" on page 435

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
6066h	6066h	Following error time out	0 ms to 65535 ms	0	ms	Immediately	"6066h" on page 436
6067h	6067h	Position window	0 to 4294967295	5872	Reference unit	Immediately	"6067h" on page 436
6068h	6068h	Position window time	0 ms to 65535 ms	0	ms	Immediately	"6068h" on page 436
606Ch	606Ch	Actual speed	–2147483648 to +2147483647	0	Reference unit/s	Unchangeable	"606Ch" on page 437
606Dh	606Dh	Velocity window	0rpm–65535rpm	10	rpm	Immediately	"606Dh" on page 437
606Eh	606Eh	Velocity window time	0 ms to 65535 ms	0	ms	Immediately	"606Eh" on page 437
606Fh	606Fh	Velocity threshold	0rpm–65535rpm	10	rpm	Immediately	"606Fh" on page 438
6070h	6070h	Velocity threshold time	0 ms to 65535 ms	0	ms	Immediately	"6070h" on page 438
6071h	6071h	Target torque	-4000. to 4000.	0	0.001	Immediately	"6071h" on page 439
6072h	6072h	Max. torque	0. to 4000.	3500	0.001	Immediately	"6072h" on page 439
6074h	6074h	Torque reference	-4000. to 4000.	0	0.001	Unchangeable	"6074h" on page 440
6077h	6077h	Torque actual value	-4000. to 4000.	0	0.001	Unchangeable	"6077h" on page 440
607Ah	607Ah	Target position	-2147483648 to 2147483647	0	Reference unit	Immediately	"607Ah" on page 440
607Ch	607Ch	Home offset	-2147483648 to 2147483647	0	Reference unit	Immediately	"607Ch" on page 441
607D.01h	607D-01h	Min. position limit	-2147483648 to 2147483647	-2147483648	Reference unit	Immediately	"607D_en.01h" on page 441
607D.02h	607D-02h	Max. position limit	-2147483648 to 2147483647	2147483647	Reference unit	Immediately	"607D_en.02h" on page 442

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
607Eh	607Eh	Reference polarity	0 to 127	0	-	Immediately	"607Eh" on page 442
607Fh	607Fh	Max. profile velocity	0 to 4294967295	838860800	Reference unit/s	Immediately	"607Fh" on page 442
6081h	6081h	Profile velocity	0 to 4294967295	13981013	Reference unit/s	Immediately	"6081h" on page 443
6083h	6083h	Profile acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"6083h" on page 443
6084h	6084h	Profile deceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"6084h" on page 443
6085h	6085h	Quick stop deceleration	0 to 4294967295	2147483647	Reference unit/s^2	Immediately	"6085h" on page 444
6087h	6087h	Torque slope	0.%/s–4294967295.%/s	4294967295	0.1%/s	Immediately	"6087h" on page 444
6091.01h	6091-01h	Motor resolution	1 to 4294967295	1	-	At stop	"6091_en.01h" on page 445
6091.02h	6091-02h	Shaft resolution	1 to 4294967295	1	-	At stop	"6091_en.02h" on page 445
6098h	6098h	Homing method	-3 to 35	1	-	Immediately	"6098h" on page 445
6099.01h	6099-01h	Speed during search for switch	0 to 4294967295	13981013	Reference unit/s	At stop	"6099_en.01h" on page 447
6099.02h	6099-02h	Speed during search for zero	0 to 4294967295	1398101	Reference unit/s	At stop	"6099_en.02h" on page 447
609Ah	609Ah	Homing acceleration	0 to 4294967295	1398101333	Reference unit/s^2	Immediately	"609Ah" on page 447
60B8h	60B8h	Touch probe function	0 to 65535	0	-	Immediately	"60B8h" on page 448
60B9h	60B9h	Touch probe status	0 to 65535	0	-	Unchangeable	"60B9h" on page 449

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60BAh	60BAh	Touch probe 1 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BAh" on page 450
60BBh	60BBh	Touch probe 1 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BBh" on page 450
60BCh	60BCh	Touch probe 2 positive edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BCh" on page 451
60BDh	60BDh	Touch probe 2 negative edge	-2147483648 to 2147483647	0	Reference unit	Unchangeable	"60BDh" on page 451
60C1.01h	60C1-01h	Interpolation displacement	-2147483648 to 2147483647	0	Reference unit	Immediately	"60C1_en.01h" on page 451
60C2.01h	60C2-01h	Interpolation time period	1 to 20	1	-	Immediately	"60C2_en.01h" on page 451
60C2.02h	60C2-02h	Interpolation time units	0 to 253	253	-	Immediately	"60C2_en.02h" on page 452
60C5h	60C5h	Max. acceleration	0 to 4294967295	4294967295	Reference unit/s^2	Immediately	"60C5h" on page 452
60C6h	60C6h	Max. deceleration	0 to 4294967295	4294967295	Reference unit/s^2	Immediately	"60C6h" on page 452
60D5h	60D5h	Touch probe 1 positive edge counter	0 to 65535	0	-	Unchangeable	"60D5h" on page 453
60D6h	60D6h	Touch probe 1 negative edge counter	0 to 65535	0	-	Unchangeable	"60D6h" on page 453
60D7h	60D7h	Touch probe 2 positive edge counter	0 to 65535	0	-	Unchangeable	"60D7h" on page 453
60D8h	60D8h	Touch probe 2 negative edge counter	0 to 65535	0	-	Unchangeable	"60D8h" on page 454

Parameter	Hexadecimal Parameters	Name	Setpoint	Default	Unit	Change Method	Page
60E0h	60E0h	Positive torque limit value	0. to 4000.	3500	0.001	Immediately	*" 60E0h" on page 454*
60E1h	60E1h	Negative torque limit value	0. to 4000.	3500	0.001	Immediately	*" 60E1h" on page 454*
60F4h	60F4h	Position deviation	-2147483648 to 2147483647	0	Reference unit	Unchangeable	*" 60F4h" on page 454*
60FCh	60FCh	Position reference	–2147483648 p to +2147483647 p	0	p	Unchangeable	*" 60FCh" on page 455*
60FDh	60FDh	Digital inputs	0 to 4294967295	0	-	Unchangeable	*" 60FDh" on page 455*
60FFh	60FFh	PV target velocity	–2147483648 to +2147483647	0	Reference unit/s	Immediately	*" 60FFh" on page 456*
60FE.01h	60FE-01h	Physical outputs	0 to 4294967295	0	-	Immediately	*" 60FE_en.01h" on page 456*
60FE.02h	60FE-02h	Bitmask	0 to 4294967295	0	-	Immediately	*" 60FE_en.02h" on page 457*

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Shenzhen Inovance Technology Co., Ltd.

www.inovance.com

Add.: Inovance Headquarters Tower, High-tech Industrial Park, Guanlan Street, Longhua New District, Shenzhen
Tel: (0755) 2979 9595 Fax: (0755) 2961 9897

Suzhou Inovance Technology Co., Ltd.

www.inovance.com

Add.: No. 16 Youxiang Road, Yuexi Town, Wuzhong District, Suzhou 215104, P.R. China
Tel: (0512) 6637 6666 Fax: (0512) 6285 6720