INOVANCE

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SV680F-INT Series Servo Drive

Hardware Guide

Industrial Automation

Intelligent Elevator

New Energy Vehicle

Industrial Robot

Rail Transit

Data code PS00018067A00

Preface

Introduction

The SV680F-INT series high-performance AC servo drive covers a power range from 50 W to 7.5 kW. It supports PROFINET communication protocol and carries Ethernet communication interfaces to work with the host controller for a networked operation of multiple servo drives.

The drive supports stiffness level setting, inertia auto-tuning and vibration suppression to simplify the operation process. It allows a quiet and stable operation through cooperating with the MS1 series medium-to-small inertia high-response servo motors configured with a 20-, 23- or 26-bit multi-turn absolute encoder.

It is suitable for lithium battery PACK, printing and packaging, logistics, automobile manufacturing, tobacco and other industries to achieve fast and accurate collaborative control.

This manual provides information on selection, installation, commissioning, function, troubleshooting and parameters of the equipment.

More documents

Name	Data Code	Description
SV680F-INT Series Servo Drive User Guide	PS00005891	Provides information on selection, installation, commissioning, function, troubleshooting and parameters of the equipment.
SV680F-INT Series Servo Drive Parameter Guide	PS00018071	Introduces the parameters of the drive, including description of parameters, a list of fault codes, a list of alarm codes, description of faults and description of alarms.
SV680F-INT Series Servo Drive Function Application Guide	PS00018069	Introduces the functions and faults of the drive, including function overview, adjustment, communication, basic servo functions and fault handling.
SV680F-INT Series Servo Drive Hardware Guide	PS00018067	Describes technical data, installation, terminals, required certificates and standards and solutions to common EMC problems of the drive.
SV680F-INT Series Servo Drive Quick Start Guide	PS00018068	Describes the model number, installation, terminals and quick commissioning and operation of the drive.
SV680F-INT Series Servo Drive Safety Guide	PS00009744	Presents installation of the servo drive, including installation steps, mechanical installation, and electrical installation.

Revision History

Date	Version	Description
2025–03	A00	First release.

Access to the Guide

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

- Do keyword search at *http://www.inovance.com*.
- Scan the QR code on the equipment to acquire more.
- Scan the QR code below to install the app, where you can search for and download manuals.

Scope of standard functions

This guide describes function applications. The function scope described in the guide may be different from those of the delivered system.

The system may run functions not described in the guide. If necessary, contact the sales personnel.

The guide does not provide all details on all product models. It does not describe all problems that may be present during device installation, operation and maintenance and their countermeasures. The equipment manufacturer shall provide instructions of the functions added or modified by it.

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,maintenance fee will be charged for the following damage:

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

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

For details, see the Product Warranty Card.

Safety Instructions

Disclaimer

- This chapter presents essential safety instructions for a proper use of the equipment. Before operating the equipment, read through the guide and comprehend all the safety instructions. 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 usage.

Safety Levels and Definitions

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

Safety Instructions

- Drawings in the 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.
- The drawings in the guide are shown for illustration only and may be different from the product you purchased.

Unpacking
WARNING
• Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking. • Do not install the equipment if you find water seepage or missing or damaged components upon unpacking. • Do not install the equipment if you find the packing list does not conform to the equipment you received.

CAUTION

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

Storage and Transportation

WARNING

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

CAUTION

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

Installation

DANGER

- The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.

WARNING
• Read through the guide and safety instructions before installation. • Do not install this equipment in places with strong electric or magnetic fields. • Before installation, check that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards. • Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock. • When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire. • Do not retrofit the equipment. • Do not fiddle with the bolts used to fix equipment components or the bolts marked in red. • When the equipment is installed in a cabinet or final assembly, a fireproof enclosure providing both electrical and mechanical protections must be provided. The IP rating must meet IEC standards and local laws and regulations. • Before installing equipments with strong electromagnetic interference, such as a transformer, install a shielding equipment for the equipment to prevent malfunction. • Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply will result in a fire.
CAUTION
• Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes. • Resonance may occur when the equipment operating at a constant speed executes variable speed operations. In this case, install the vibration-proof rubber under the motor frame or use the vibration suppression function to reduce resonance.
Wiring
DANGER
• Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals. • Before wiring, cut off all the power supplies of the equipment. and wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. After waiting for the designated time, measure the DC voltage in the main circuit to ensure the DC voltage is within the safe voltage range. Failure to comply will result in an 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 can result in electric shock.

WARNING
• Do not connect the input power supply to the output end of the equipment. Failure to comply can result in equipment damage or even a fire. • When connecting a drive to the motor, check that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation. • Cables used for wiring must meet cross sectional area and shielding requirements. The shield of the cable must be reliably grounded at one end. • Fix the terminal screws with the tightening torque specified in the user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire. • After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in an electric shock or equipment damage.
CAUTION • Follow the proper electrostatic discharge (ESD) procedure and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or to the internal circuit of the product. • Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply will result in equipment malfunction.
Power-on
DANGER • Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted. • Check that the power supply meets equipment requirements before power-on to prevent equipment damage or a fire. • After power-on, do not open the cabinet door or protective cover of the equipment, touch any terminal, or disassemble any unit or component of the equipment. Failure to comply will result in an electric shock.
WARNING • Perform a trial run after wiring and parameter setting to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage. • Before power-on, check that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may result in a fire. • Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in death or personal injuries.
Operation

DANGER

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

WARNING

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

Maintenance

DANGER

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

WARNING

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

Repair

DANGER

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

WARNING

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

Disposal

WARNING

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

Additional Precautions

Cautions for Motor Grounding

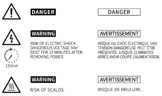
For applications such as welding machines, connect the PE cable of the motor to the screws of the cast component of the drive. Failure to comply may result in damage to the motor.

Effect of the electromagnetic field on implants

- The motor may harm a nearby person who wears a medical implant.
- The electromagnetic field may cause malfunction of the medical Implant (such as the heartbeat starter) being used.

Safety label

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. The following table describes the meaning 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 SV680-INT Series

1.1 Product Information

Description of the Model

SV680 F S 2R8 I GINT
① ② ③ ④ ⑤ ⑥

1 **Series** SV680: SV680 general-purpose servo drive	4 **Rated output current**	5 **Model configuration** I: Standard type S: Functional safety type
2 **Product Type** F: PROFINET communication	S: 200 V 1R6: 1.6 A 2R8: 2.8 A 5R5: 5.5 A 7R6: 7.6 A 012: 12.0 A 018: 18.0 A 022: 22.0 A 027: 27.0 A	6 **Model configuration** GINT: global version
3 **Voltage class** S: 200 V T: 400 V	T: 400 V 3R5: 3.5 A 5R4: 5.4 A 8R4: 8.4 A 012: 12.0 A 017: 17.0 A 021: 21.0 A 026: 26.0 A	

Nameplate

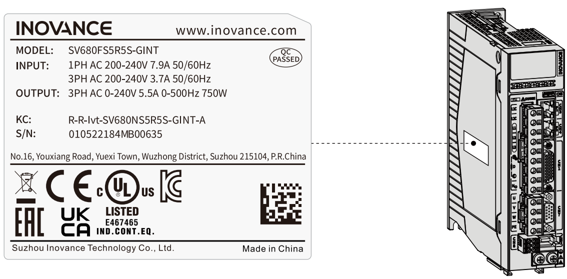


Figure 1-1 Nameplate

Encryption of the production serial number

01050202 4 S 7 00001

① ② ③ ④ ⑤

1 **Internal code** Equipment material code	3 **Year** 9: 2009 A: 2010 ... S: 2024 ... Note: I/L/O/Q is not used.	5 **Lot number** 00001: 1st in current month 00002: 2nd in current month 00003: 3rd in current month ... Range: 00001 to 99999
2 **Manufacturer code** 4: Suzhou Inovance	4 **Month** 1: January 2: February ... A: October B: November C: December	

Example: The S/N 010502024S700001 indicates the drive is manufactured in July, 2024.

1.1.1 Components

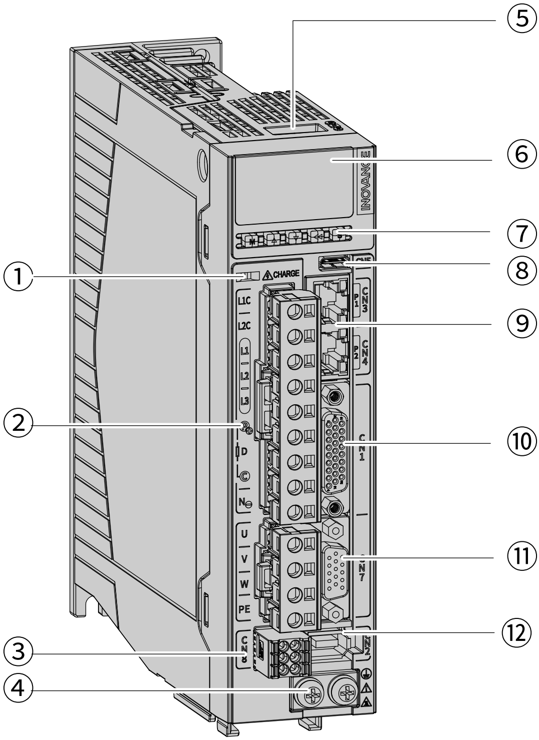


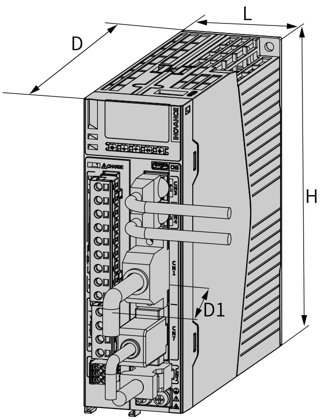
Figure 1-2 Servo drive components

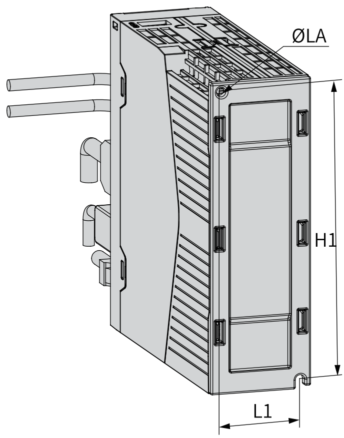
Table 1–1 Description of servo drive components

No.	Name	Description
1	CHARGE (bus voltage indicator)	Indicates the electric charge is present in the bus capacitor. When the indicator turns on, charges possibly still exist in the internal capacitor of the servo unit, even if the power supply of the main circuit is OFF. To prevent electric shock, do not touch the power terminals when this indicator lights up.
2	Main circuit terminal	For detailed description of main circuit terminals, see *"6.1.1 Terminal Pin Arrangement" on page 93*.
3	CN8 (brake and PTC input terminal)	Connected to brake and PTC.
4	Servo drive grounding terminal	Connected to the grounding terminal of the motor/power supply for grounding purpose.
5	CN6 (STO safety function terminal)	Connected to external functional safety signal for functional safety purpose.

No.	Name	Description
6	LED display	The 5-digit 8-segment LED display is used to show servo system's running state and parameter setting.
7	Keys	M: Used to switch parameters in sequence. ▲: Increases the value of the blinking digit. ▼: Decreases the value of the blinking digit. ◀◀: Used to shift the blinking position leftwards (long press to turn to the next page when the displayed number exceeds five digits). S: Saves modifications and enters the next menu.
8	CN5 (communication terminals)	Supports online upgrade and background commissioning when the drive is powered on.
9	CN3, CN4 (PROFINET communication terminal)	CN3 (P1) is connected to the host controller, and CN4 (P2) is connected to a slave.
10	CN1 (control terminal)	Used by reference input signals and other I/O signals.
11	CN7 (encoder feedback terminal)	Supports communication encoder and pulse encoder.
12	CN2 (encoder feedback terminal)	Supports communication-type encoders.

1.1.2 Product Dimensions





Size	L	H	D	L1	H1	D1	ϕLA	Tightening Torque	Mass
	Unit: mm (in.)							Unit: (N·m)	Unit: (kg)
A	45.5 (1.79)	170 (6.69)	150 (5.91)	33 (1.30)	161 (6.34)	75 (2.95)	2×M4	1.2	0.96
C	55±1 (2.17±0.04)	170 (6.69)	173±1 (6.81±0.04)	44 (1.73)	160 (6.30)	75 (2.95)	2×M4	1.2	1.3
D	80±1 (3.15±0.04)	170 (6.69)	183 (7.20)	71 (2.80)	160 (6.30)	75 (2.95)	3×M4	1.2	1.8
E	90 (3.54)	250 (9.84)	230 (9.06)	78 (3.07)	240.5 (9.47)	75 (2.95)	4×M4	1.2	3.6

说明

For detailed drawings on product dimensions, see: *"3.3.3 Installation Dimensions" on page 70*

1.2 Specifications

1.2.1 Electrical Specifications

- Single-phase 200 V drive

Item		Size A		Size C		Size D
Servo Drive Model		S1R6	S2R8	S5R5	S7R6	S012
Drive Power (kW)		0.2	0.4	0.75	1.0	1.5
Max. applicable motor capacity (kW)		0.2	0.4	0.75	1.0	1.5
Power supply equipment capacity (kVA)		1.4	2.8	4.6	6.0	8.0
Continuous output current (Arms)		1.6	2.8	5.5	7.6	12.0
Max. output current (Arms)		5.8	10.1	16.9	23.0	32.0
Main circuit[*]	Continuous input current (Arms)	2.3	4.0	7.9	9.6	12.8
	Main circuit power supply	Single-phase 200 VAC–240 VAC, -10% to +10%, 50 Hz/60 Hz				
	Heat (W)[1]	12	23.8	38.2	47.32	69.84
Control circuit	Control circuit power supply	Single-phase 200 VAC–240 VAC, -10% to +10%, 50 Hz/60 Hz				
	Heat (W)[2]	16				

Item		Size A		Size C		Size D
Braking resistor	Resistance (Ω)	Optional	Optional	50	25	25
	Resistor power (W)	Optional	Optional	50	80	80
	Min resistance of external resistor (Ω)	40	40	40	20	15
	Max. braking energy absorbed by capacitor (J)	9.3	18.59	32.42	32.42	47.68
	Braking resistor	All models in the series support built-in and external braking resistors. But Size A does not come with a built-in braking resistor as standard				
Cooling mode		Self-cooling		Air cooling		
Overvoltage class		III				
Max. Input Surge Current at Start-up (A)		18.65	18.65	9.325	9.325	12.43333
3τ(ms) (3 x RC time constant)		23.4	46.8	163.2	163.2	180

Note

[*]: For S1R6, S2R8, S5R5, S7R6 and S012 drives, the main circuit of the servo drive supports single-phase 200 V power supplies without derating.

- Three-phase 200 V drive

Item		Size A		Size C		Size D	Size E		
Servo Drive Model		S1R6	S2R8	S5R5	S7R6	S012	S018	S022	S027
Drive Power (kW)		0.2	0.4	0.75	1.0	1.5	2.0	3.0	5.0
Max. applicable motor capacity (kW)		0.2	0.4	0.75	1.0	1.5	2.0	3.0	5.0
Power supply equipment capacity (kVA)		1.21	2.42	3.84	5.05	6.68	8.33	10.42	20.08
Continuous output current (Arms)		1.6	2.8	5.5	7.6	12.0	18.0	22.0	27.0
Max. output current (Arms)		5.8	10.1	16.9	23.0	32.0	45	55	67.5
Main circuit	Continuous input current (Arms)	1.1	2.3	4.4	5.1	8.0	8.7	11.0	23.8
	Main circuit power supply	3-phase 200 VAC–240 VAC, -10% to +10%, 50 Hz/60 Hz							
	Heat (W)[1]	12	23.8	38.2	47.32	69.84	120	125	200
Control circuit	Control circuit power supply	Single-phase 200 VAC–240 VAC, -10% to +10%, 50 Hz/60 Hz							
	Heat (W)[2]	16							

Item		Size A		Size C		Size D	Size E		
Braking resistor	Resistance (Ω)	Optional	Optional	50	25	25	20	20	20
	Resistor power (W)	Optional	Optional	50	80	80	100	100	100
	Min resistance of external resistor (Ω)	40	40	40	20	15	20	20	20
	Max. braking energy absorbed by capacitor (J)	9.3	18.59	32.42	32.42	47.68	78.19	114.43	114.43
	Braking resistor	All models in the series support built-in and external braking resistors. But Size A does not come with a built-in braking resistor as standard					Built-in and external resistor is supported		
Cooling mode		Self-cooling		Air cooling					
Overvoltage class		III							
Max. Input Surge Current (A)		18.65	18.65	9.325	9.325	12.43333	12.43333	12.43333	12.43333
3τ(ms) (3 x RC time constant)		23.4	46.8	163.2	163.2	180	295.2	432	432

- Three-phase 400 V drive

Item		Size C		Size D		Size E		
Servo Drive Model		T3R5	T5R4	T8R4	T012	T017	T021	T026
Drive Power (kW)		1.0	1.5	2.0	3.0	5.0	6.0	7.5
Max. applicable motor capacity (kW)		1.0	1.5	2.0	3.0	5.0	6.0	7.5
Power supply equipment capacity (kVA)		6.05	9.08	10.23	15.15	22.25	25.0	31.25
Continuous output current (Arms)		3.5	5.4	8.4	12.0	17.0	21.0	26.0
Max. output current (Arms)		11.0	14.0	20.0	30.0	42.5	52.5	65.0
Main circuit	Continuous input current (Arms)	2.4	3.6	5.6	8.0	12.0	16.0	21.0
	Main circuit power supply	3-phase 380 VAC–480 VAC, -10% to +10%, 50 Hz/60 Hz						
	Heat (W)[1]	39.5	63.25	94.82	135.47	187.62	228.28	258.63
Control circuit	Control circuit power supply	Single-phase 380 VAC–480 VAC, -10% to +10%, 50 Hz/60 Hz						
	Heat (W)[2]	16						
Braking resistor	Resistance (Ω)	100	100	50	50	35	35	35
	Resistor power (W)	80	80	80	80	100	100	100
	Min resistance of external resistor (Ω)	80	60	45	40	35	25	25
	Max. braking energy absorbed by capacitor (J)	36.06	43.79	64.40	64.40	105.62	154.56	154.56
	Braking resistor	Built-in braking resistor						

Item	Size C		Size D		Size E		
Cooling mode	Air cooling						
Overvoltage class	III						
Max. Input Surge Current (A)	18.65	18.65	24.86667	24.86667	24.86667	24.86667	24.86667
3τ(ms) (3 x RC time constant[3])	33.6	40.8	45	45	73.8	108	108

Note

- [1]: Main circuit heat refers to the heat generated by the drive under rated output current.
- [2]: Control circuit heat refers to the heat generated by the drive under rated input current.
- [3] RC time constant = Pre-charge resistor R x Bus capacitor C, used to represent the power-on time, that is, the bus voltage becomes stable after the time of 3τ..
- Select the external braking resistor according to actual operating conditions. Fore details, see *"2.4.4 Braking resistor" on page 43*.

1.2.2 Technical Specifications

<table>
<tr><th colspan="3">Item</th><th>Description</th></tr>
<tr><td rowspan="12">General Specifi cations</td><td colspan="2" rowspan="2">Control mode</td><td>IGBT SVPWM control, sine wave current drive mode</td></tr>
<tr><td>200 V, 400 V: Single-phase/Three-phase full bridge rectification</td></tr>
<tr><td colspan="2">Encoder feedback</td><td>The drive supports Inovance 20-, 23- and 26-bit multi-turn absolute encoders and functional safety encoders (the drive must be of the functional safety type).
The following encoders are supported: Inovance communication encoder, ABZ incremental encoder, BiSS-C encoder, SSI encoder and EnDat 2.2 encoder.
You can use the Inovance multi-turn absolute encoder as an incremental encoder if you remove the battery.
Note: For details, see Section "Description of Commissioning Objects" in SV680F-INT Series Servo Drive Quick Start Guide.</td></tr>
<tr><td rowspan="9">Condi tions for use</td><td>Operating/ Storage temperature [1]</td><td>0°C to 55°C (average load ratio not exceeding 80% in ambient temperatures between 45°C to 55°C) (non freezing)/ -40°C to 70°C</td></tr>
<tr><td>Operating/ Storage humidity</td><td>Below 90% RH (no condensation)</td></tr>
<tr><td>Vibration resistance</td><td>Operation:
● Displacement vibration amplitude: 3.5 mm at 5 Hz–8.4 Hz
● Acceleration vibration amplitude: 1 g at 8.4 Hz–200 Hz
Product package:
● 5 Hz–100 Hz： $0.01g^2$/Hz
● 200 Hz: $0.001g^2$/Hz
● Grms = 1.14 g</td></tr>
<tr><td>Impact resistance</td><td>19.6 m/s^2</td></tr>
<tr><td>IP rating</td><td>IP20
Note: excluding terminals (IP00)</td></tr>
<tr><td>Pollution degree</td><td>PD2</td></tr>
<tr><td>Protection class</td><td>Class I</td></tr>
<tr><td>Altitude</td><td>The maximum altitude is 2000 m.
● For altitudes not higher than 1000 m, derating is not required
● Derating is required for altitudes above 1000 m (derate 1% for every additional 100 m)
● For altitudes above 2000 m, contact Inovance.</td></tr>
</table>

<table>
<tr><th colspan="3">Item</th><th>Description</th></tr>
<tr><td rowspan="4">Speed/ torque control mode</td><td rowspan="2">Performance</td><td>Speed control range</td><td>1 rpm–10000 rpm (The lower limit of the speed control range is that the load can be rotated under rated motor torque)</td></tr>
<tr><td>Torque control accuracy</td><td>±2%</td></tr>
<tr><td rowspan="2">Input signal</td><td>Speed Reference Input</td><td rowspan="2">Network-type instructions are from PROFINET communication</td></tr>
<tr><td>Torque Reference</td></tr>
<tr><td>Position Control Mode</td><td>Input signal</td><td>Position reference</td><td>Network-type instructions are from PROFINET communication</td></tr>
<tr><td rowspan="5">Input/ Output signal</td><td>DI signal</td><td>DI signal function assignment</td><td>5 DIs
DI1–DI3: normal DI (rising edge (24 V input low to high) input delay: 50 µs, falling edge (24 V input high to low) input delay: 200 µs, voltage range: 20 V–30 V)
DI4–DI5: fast DI (rising edge (24 V input low to high) input delay: 10 µs, falling edge (24 V input high to low) input delay: 50 µs, voltage range: 20 V–30 V)</td></tr>
<tr><td>Digital output signal</td><td>Output signal function selection</td><td>2 DOs
With-load capacity: 50 mA Voltage range: 5 V to 30 V</td></tr>
<tr><td colspan="2" rowspan="2">Analog input signal</td><td>AI1 voltage input: 16-bit, -10 V to +10 V; max. allowable voltage: ±12 V</td></tr>
<tr><td>AI2 voltage input: 12-bit, -10 V to +10 V; max. allowable voltage: ±12 V</td></tr>
<tr><td colspan="2">Analog output signal</td><td>AO1 voltage output range: -10 V to +10 V</td></tr>
</table>

Item			Description
Built-in functions	Overtravel (OT) prevention		The servo drive stops immediately when P-OT or N-OT is active
	Electronic gear ratio		0.001 ⩽ B/A ⩽ 26843545.6
	Protective functions		Including protections against overcurrent, overvoltage, undervoltage, overload, main circuit detection error, heatsink overheat, power phase loss, overspeed, encoder error, CPU error, and parameter error
	Safety Function	Type	STO (standard)/SS1/SS1E/SBC/SOS/SS2/SS2E/SLS/SDI/SSM[2]
		Applicable standard	IEC61800-5-2:2016
	LED display		Main circuit CHARGE indicator, 5-digit LED display
	Vibration suppression		5 notches (including two adaptive notches) available, 50 Hz to 8000 Hz
	Usability functions		One-key parameter tuning, adaptive parameter tuning, intelligent parameter tuning, speed observer, and model tracking
	Communication function	Software commissioning	Type-C
		Multi-station communication	PROFINET, PROFIsafe (available for functional safety models)
		Number of multi-station communication axes	Maximum number of slaves: 65535 (determined by the PLC)
		Axis address setting	No physical knob, automatically assigned by host controller (PROFINET)
		Function	Including status display, user parameter setting, monitored value display, fault tracing display, JOG and auto-tuning, and communication and motion control command setting
	Others		Gain tuning, alarm log, JOG

Note

- [1] Install the servo drive within the allowable ambient temperature range. When it is installed inside a control cabinet, the temperature inside the cabinet must also be within this range.
- [2] For S models only.

1.2.3 Dynamic Brake Characteristics

According to the motor model, initial speed and load inertia, the dynamic braking distance can be estimated. The approximate value of the dynamic braking distance can be calculated by the following formula. For the accurate value, please use the dynamic braking calculation function provided by our software.

Maximum braking distance s (turn) is:

$$s=\frac{V_0}{60}\left(t_e+(\tau_1+\tau_2 V_0^{\ 2})(1+\frac{J_L}{J_M})\right)$$

The coefficient is as follows:

$$\tau_1=\frac{2R_sJ}{3p_n^{\ 2}\Psi_f^{\ 2}}=\frac{10000\pi^2R_sJ}{9K_e^{\ 2}}$$

$$\tau_2=\frac{\pi^2L_d^{\ 2}J}{4050R_s\Psi_f^{\ 2}}=\frac{100L_d^{\ 2}\pi^4P_n^{\ 2}J}{243R_sK_e^{\ 2}}$$

$$\Psi_f=\frac{\sqrt{6}K_e}{100\pi P_n}$$

- V_0 : Maximum feedback speed
- t_e : Dynamic brake program and relay delay
- J_L: Load moment of inertia
- J_M : Motor moment of inertia
- P_n : Number of motor pole pairs
- R_s : Stator resistance (Ω)
- K_e : Kelvin, thermodynamic temperature unit
- L_q , L_d : q-axis inductance (mH), d-axis inductance (mH).

1.2.4 Load Moment of Inertia

The load moment of inertia represents the inertia of the load. The larger the load moment of inertia is, the weaker the responsiveness is. An excessively high inertia may result in unstable motion. The allowable load moment of inertia () of the motor is restricted. This value is provided strictly as a guideline and results depend on the motor driving conditions.

An overvoltage warning may occur during deceleration if the load moment of inertia exceeds the allowable value. For servo drives with a built-in braking resistor, an overload alarm my be present. In case of such warnings, take one of the following measures:

- Reduce the torque limit values.
- Reduce the deceleration rate.
- Reduce the maximum speed.
- Install an external braking resistor if the warning cannot be cleared using the above measures.

Caution

- Drives below 400 W does not provide a built-in braking resistor.
- Even you use a built-in resistor, the energy generated in some conditions will exceed the allowable capacity loss (W) of the resistor. Therefore, an external braking resistor is required.

Table 1–2 Allowable Load Moment of Inertia

<table>
<tr><th rowspan="2">*Motor speed*</th><th colspan="2">Size A</th><th colspan="4">Size C</th><th colspan="3">Size D</th><th colspan="6">Size E</th></tr>
<tr><th>S1R6</th><th>S2R8</th><th>S5R5</th><th>S7R6</th><th>T3R5</th><th>T5R4</th><th>S012</th><th>T8R4</th><th>T012</th><th>S018</th><th>S022</th><th>S027</th><th>T017</th><th>T021</th><th>T026</th></tr>
<tr><td>1500rpm</td><td colspan="15">x 20</td></tr>
<tr><td>3,000 rpm</td><td colspan="9">x 20</td><td colspan="6">x 10</td></tr>
<tr><td>4500rpm</td><td colspan="9">x 20</td><td colspan="5">x 5</td><td>Not supported</td></tr>
<tr><td>6000 rpm</td><td colspan="9">x 20</td><td colspan="5">x 5</td><td>Not supported</td></tr>
<tr><td>7000rpm</td><td colspan="4">x 20</td><td colspan="11">Not supported</td></tr>
<tr><td colspan="16">Note: *Motor speed* refers to the maximum speed supported by the motor driven by the drive. For example, MS1H1/H4 can reach 7000 rpm, MS1H2 can reach 6000 rpm, and MS1H3 can reach 4500 rpm. The AC drive may raise an alarm if you set a short acceleration/deceleration time when the running speed exceeds 10 times of the maximum speed.</td></tr>
</table>

1.2.5 PROFINET Communication Technical Specifications

<table>
<tr><th colspan="2">PROFINET comprehensive parameters</th></tr>
<tr><th>Item</th><th>Item</th></tr>
<tr><td>Communication protocol</td><td>PROFINET</td></tr>
<tr><td>Process Data</td><td>RT and IRT</td></tr>
<tr><td>Acyclic</td><td>Enables SinaParaS access to profile parameters, function parameters, and safety parameters. The safety parameters are read only.
Enables SinaPara (mix) access to function parameters and safety parameters. The safety parameters are read only.</td></tr>
<tr><td>Bus period</td><td>RT mode: min. 1 ms
IRT mode: min. 250 μs</td></tr>
<tr><td>Sync jitter</td><td>< 1 μs</td></tr>
</table>

PROFINET comprehensive parameters	
Item	Item
Physical layer	100BASE-TX
Baud rate	100 Mbit/s (100Base-TX)
Duplex mode	Full duplex
Topology	Ring, linear, star, and tree types
Transmission distance	Less than 100 m between two nodes (with proper environment and cables)
Transmission medium	Shielded cables of Cat 5e or higher
Number of slaves	Up to 65535 (dependent on the performance of the PLC)
Bit error rate	10^{-10} Ethernet standard
I&M data	I&M0 to I&M4
GSD version	V2.25, V2.33, V2.43
Configuration version	TIA Portal V11 or higher STEP7 V5.5 or higher SMOTION and 200Smart compatible versions, consistent with SV660F
PROFINET version	V2.4
PROFINET interface	Number of ports: 2 Switch: supported
Type	PROFINET IO device

Function	PROFINET IO devices, support for medium redundancy
Alarm/diagnosis information	Supported
DCP CALL (search for device)	Supported
MRP (ring-type network)	Supported
MRPD (Quick reset ring-type network)	Supported
Profinet system redundancy	Supported
Start priority	Supported
Port disabling	Supported
No configuration is required when you change the configuration.	Supported

2 Selection

2.1 Nameplate and Model Number of the Servo Motor

Description of the Model

MS1 H1 - 75B 30C B A3 3 1 R - INT
① ② ③ ④ ⑤ ⑥ ⑦⑧⑨ ⑩

① **MS1 series servo motor** -	② **Inertia and Capacity** H1: low inertia, small capacity H2: low inertia, medium capacity H3: medium inertia, medium capacity H4: medium inertia, small capacity	③ **Rated Power (W)** One letter and two digits B: x 10 C: x 100 Example: 75B: 750 W
④ **Rated speed (rpm)** One letter and two digits B: x 10 C: x 100 Example: 30C: 3,000 rpm	⑤ **Voltage Class (V)** B: 220 D: 380	⑥ **Encoder Type** One letter and one digit A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder of functional safety type A3: 23-bit multi-turn absolute encoder
⑦ **Shaft Connection Mode** 3: Solid shaft, with key and threaded hole	⑧ **Brake, Reducer and Oil Sealing[1]** 0: No oil sealing and brake 1: With oil sealing but no brake 2: No oil sealing but with brake 4: With oil sealing and brake	⑨ **Series** R: R version ⑩ **Non-standard Features** INT: Global version

Note

- [1]: Oil seals are provided as standard for all motors except the 40-flange motor.
- The MS1-R series frame-40 servo motor is upcoming.
- [2]:-S flying leads type only applies to 40/60/80-flange motors.

Nameplate

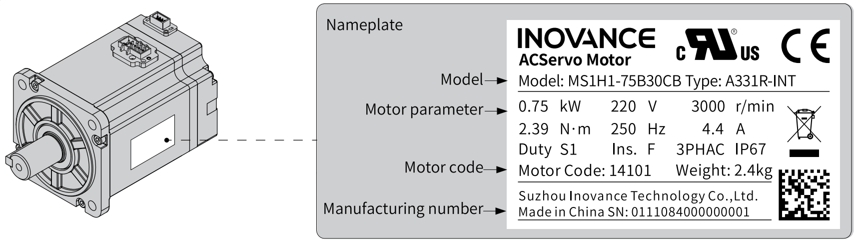


Figure 2-1 Model Number and Nameplate

For details on the SM1-R-INT series servo motor, see ***MS1-R-INT Series Servo Motor Selection Guide***.

Visit http://www.inovance.com, go to Support > Download, search by keyword, and then download the PDF file. You can also get the PDF file in the app My Inovance.

2.2 Selection of Motors

Motors with a 26-bit encoder

Servo Motor				Servo drive SV680F-INT			
Models without brake	Models with Brake	Frame (mm)	Capacity (W) (kW)	Voltage class (V)	Size	Recommended Model	No.
MS1H1 (n_N= 3000 rpm, n_{max}=7000 rpm) series ratings							
MS1H1-05B30CB-A6/ S630R-INT	MS1H1-05B30CB-A6/ S632R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H1-10B30CB-A6/ S630R-INT	MS1H1-10B30CB-A6/ S632R-INT	40	0.1	Single-phase/ Three-phase 200 V			
MS1H1-20B30CB-A6/ S631R-INT	MS1H1-20B30CB-A6/ S634R-INT	60	0.2	Single-phase/ Three-phase 200 V			
MS1H1-40B30CB-A6/ S631R-INT	MS1H1-40B30CB-A6/ S634R-INT	60	0.4	Single-phase/ Three-phase 200 V		S2R8	00003
MS1H1-55B30CB-A6/ S631R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H1-75B30CB-A6/ S631R-INT	MS1H1-75B30CB-A6/ S634R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005

<table>
<tr><th colspan="4">Servo Motor</th><th colspan="4">Servo drive
SV680F-INT</th></tr>
<tr><th>Models without brake</th><th>Models with Brake</th><th>Frame
(mm)</th><th>Capacity
(W)
(kW)</th><th>Voltage class
(V)</th><th>Size</th><th>Recommended Model</th><th>No.</th></tr>
<tr><td>MS1H1-10C30CB-A6/
S631R-INT</td><td>MS1H1-10C30CB-A6/
S634R-INT</td><td>80</td><td>1.0</td><td>Single-phase/
Three-phase
200 V</td><td>C</td><td>S7R6</td><td>00006</td></tr>
<tr><td colspan="8">MS1H2 (n_N= 3000 rpm, n_{max}= 6000 rpm) series ratings</td></tr>
<tr><td>MS1H2-10C30CB-A6/
S631R-INT</td><td>MS1H2-10C30CB-A6/
S634R-INT</td><td>100</td><td>1.0</td><td>Single-phase/
Three-phase
200 V</td><td rowspan="2">C</td><td>S7R6</td><td>00006</td></tr>
<tr><td>MS1H2-10C30CD-A6/
S631R-INT</td><td>MS1H2-10C30CD-A6/
S634R-INT</td><td>100</td><td>1.0</td><td>Three-phase
400 V</td><td>T3R5</td><td>10001</td></tr>
<tr><td>MS1H2-15C30CB-A6/
S631R-INT</td><td>MS1H2-15C30CB-A6/
S634R-INT</td><td>100</td><td>1.5</td><td>Single-phase/
Three-phase
200 V</td><td>D</td><td>S012</td><td>00007</td></tr>
<tr><td>MS1H2-15C30CD-A6/
S631R-INT</td><td>MS1H2-15C30CD-A6/
S634R-INT</td><td>100</td><td>1.5</td><td>Three-phase
400 V</td><td>C</td><td>T5R4</td><td>10002</td></tr>
<tr><td>MS1H2-20C30CB-A6/
S631R-INT</td><td>MS1H2-20C30CB-A6/
S634R-INT</td><td>100</td><td>2.0</td><td>Three-phase
200 V</td><td>E</td><td>S018</td><td>00008</td></tr>
<tr><td>MS1H2-20C30CD-A6/
S631R-INT</td><td>MS1H2-20C30CD-A6/
S634R-INT</td><td>100</td><td>2.0</td><td>Three-phase
400 V</td><td>D</td><td>T8R4</td><td>10003</td></tr>
<tr><td>MS1H2-25C30CB-A6/
S631R-INT</td><td>MS1H2-25C30CB-A6/
S634R-INT</td><td>100</td><td>2.5</td><td>Three-phase
200 V</td><td>E</td><td>S022</td><td>00009</td></tr>
<tr><td>MS1H2-25C30CD-A6/
S631R-INT</td><td>MS1H2-25C30CD-A6/
S634R-INT</td><td>100</td><td>2.5</td><td>Three-phase
400 V</td><td>D</td><td>T012</td><td>10004</td></tr>
<tr><td>MS1H2-30C30CB-A6/
S631R-INT</td><td>MS1H2-30C30CB-A6/
S634R-INT</td><td>130</td><td>3.0</td><td>Three-phase
200 V</td><td>E</td><td>S022</td><td>00009</td></tr>
<tr><td>MS1H2-30C30CD-A6/
S631R-INT</td><td>MS1H2-30C30CD-A6/
S634R-INT</td><td>130</td><td>3.0</td><td>Three-phase
400 V</td><td>D</td><td>T012</td><td>10004</td></tr>
<tr><td>MS1H2-40C30CB-A6/
S631R-INT</td><td>MS1H2-40C30CB-A6/
S634R-INT</td><td>130</td><td>4.0</td><td>Three-phase
200 V</td><td rowspan="4">E</td><td>S027</td><td>00010</td></tr>
<tr><td>MS1H2-40C30CD-A6/
S631R-INT</td><td>MS1H2-40C30CD-A6/
S634R-INT</td><td>130</td><td>4.0</td><td>Three-phase
400 V</td><td>T017</td><td>10005</td></tr>
<tr><td>MS1H2-50C30CB-A6/
S631R-INT</td><td>MS1H2-50C30CB-A6/
S634R-INT</td><td>130</td><td>5.0</td><td>Three-phase
200 V</td><td>S027</td><td>00010</td></tr>
<tr><td>MS1H2-50C30CD-A6/
S631R-INT</td><td>MS1H2-50C30CD-A6/
S634R-INT</td><td>130</td><td>5.0</td><td>Three-phase
400 V</td><td>T021</td><td>10006</td></tr>
<tr><td colspan="8">MS1H3 (n_N=1500 rpm, n_{max}= 4500 rpm) series ratings</td></tr>
<tr><td>MS1H3-85B15CB-A6/
S631R-INT</td><td>MS1H3-85B15CB-A6/
S634R-INT</td><td>130</td><td>0.85</td><td>Single-phase/
Three-phase
200 V</td><td rowspan="2">C</td><td>S7R6</td><td>00006</td></tr>
<tr><td>MS1H3-85B15CD-A6/
S631R-INT</td><td>MS1H3-85B15CD-A6/
S634R-INT</td><td>130</td><td>0.85</td><td>Three-phase
400 V</td><td>T3R5</td><td>10001</td></tr>
</table>

Servo Motor				Servo drive SV680F-INT			
Models without brake	Models with Brake	Frame (mm)	Capacity (W) (kW)	Voltage class (V)	Size	Recommended Model	No.
MS1H3-13C15CB-A6/ S631R-INT	MS1H3-13C15CB-A6/ S634R-INT	130	1.3	Single-phase/ Three-phase 200 V	D	S012	00007
MS1H3-13C15CD-A6/ S631R-INT	MS1H3-13C15CD-A6/ S634R-INT	130	1.3	Three-phase 400 V	C	T5R4	10002
MS1H3-18C15CB-A6/ S631R-INT	MS1H3-18C15CB-A6/ S634R-INT	130	1.8	Three-phase 200 V	E	S018	00008
MS1H3-18C15CD-A6/ S631R-INT	MS1H3-18C15CD-A6/ S634R-INT	130	1.8	Three-phase 400 V	D	T8R4	10003
MS1H3-29C15CB-A6/ S631R-INT	MS1H3-29C15CB-A6/ S634R-INT	180	2.9	Three-phase 200 V	E	S022	00009
MS1H3-29C15CD-A6/ S631R-INT	MS1H3-29C15CD-A6/ S634R-INT	180	2.9	Three-phase 400 V	D	T012	10004
MS1H3-44C15CB-A6/ S631R-INT	MS1H3-44C15CB-A6/ S634R-INT	180	4.4	Three-phase 200 V	E	S027	00010
MS1H3-44C15CD-A6/ S631R-INT	MS1H3-44C15CD-A6/ S634R-INT	180	4.4	Three-phase 400 V	E	T017	10005
MS1H3-55C15CD-A6/ S631R-INT	MS1H3-55C15CD-A6/ S634R-INT	180	5.5	Three-phase 400 V	E	T021	10006
MS1H3-75C15CD-A6/ S631R-INT	MS1H3-75C15CD-A6/ S634R-INT	180	7.5	Three-phase 400 V	E	T026	10007
MS1H4 (n_N= 3000 rpm, n_{max}=7000 rpm) series ratings							
MS1H4-05B30CB-A6/ S630R-INT	MS1H4-05B30CB-A6/ S632R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-10B30CB-A6/ S630R-INT	MS1H4-10B30CB-A6/ S632R-INT	40	0.1	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-05B30CB-A6/ S631R-INT	MS1H4-05B30CB-A6/ S634R-INT	40	0.05	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-10B30CB-A6/ S631R-INT	MS1H4-10B30CB-A6/ S634R-INT	40	0.1	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-20B30CB-A6/ S631R-INT	MS1H4-20B30CB-A6/ S634R-INT	60	0.2	Single-phase/ Three-phase 200 V	A	S1R6	00002
MS1H4-40B30CB-A6/ S631R-INT	MS1H4-40B30CB-A6/ S634R-INT	60	0.4	Single-phase/ Three-phase 200 V	A	S2R8	00003

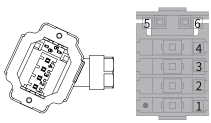
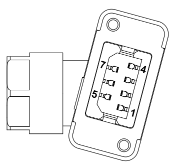
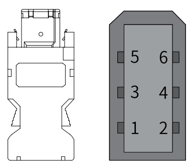
Servo Motor				Servo drive SV680F-INT			
Models without brake	Models with Brake	Frame (mm)	Capacity (W) (kW)	Voltage class (V)	Size	Recommended Model	No.
MS1H4-55B30CB-A6/ S631R-INT	-	80	0.55	Single-phase/ Three-phase 200 V	C	S5R5	00005
MS1H4-75B30CB-A6/ S631R-INT	MS1H4-75B30CB-A6/ S634R-INT	80	0.75	Single-phase/ Three-phase 200 V		S5R5	00005
MS1H4-10C30CB-A6/ S631R-INT	MS1H4-10C30CB-A6/ S634R-INT	80	1.0	Single-phase/ Three-phase 200 V	C	S7R6	00006

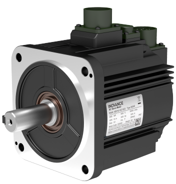
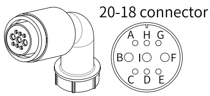
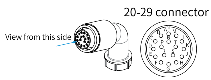
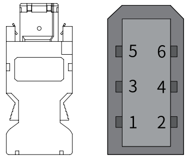
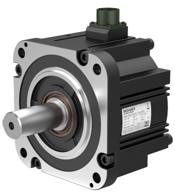
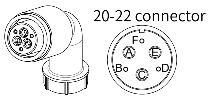
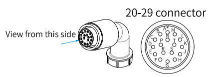
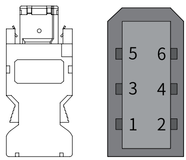
Note

Models of drives:

- S: 220 V voltage class
- T: 400 V voltage class
- 1R6: 1.6 A rated output current, 2R8: 2.8 A rated output current..., 026: 26 A rated output current, 027: 27 A rated output current

2.3 Terminals on the Motor Side

Name	Diagram	Power cable 6-pin connector		Motor-side encoder 7-pin connector		Drive-side 6-pin male connector	
Terminals of 40, 60, and 80 flange motors (terminal type)							
		Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
		1	PE	1	PS+	1	+5 V
		2	W	2	PS-	2	GND
		3	V	3	DC+	5	PS+
		4	U	4	DC-	6	PS-
		5	Brake	5	+5 V	Enclosure	PE
		6	(polarity insensitive)	6	GND		
				7	PE		

Terminals	Motor	Power cable connector			Encoder cable connector of motors			Drive-side 6-pin male connector		
Terminals of 100 and 130 flange motors										
		Pin No.	Pin No.	Color	Pin No.	Signal Name	Color	Pin No.	Signal Name	Color
		B	U	Blue	A	PS+	Blue	1	+5 V	Red
		I	V	Black	B	PS-	Purple	2	GND	Orange
		F	W	Red	E	Battery (+)	Brown	5	PS+	Blue
		G	PE	Yellow/ Green	F	Battery (-)	Black	6	PS-	Purple
		C	Brake	Red	G	+5 V	Red	Enclosure	PE	-
		E	(polarity insensitive)	Black	H	GND	Orange			
					J	Shield	-			
Terminals of 180 flange motors										
		Pin No.	Pin No.	Color	Pin No.	Signal Name	Color	Pin No.	Signal Name	Color
		A	U	Blue	A	PS+	Blue	1	+5 V	Red
		C	V	Black	B	PS-	Purple	2	GND	Orange
		E	W	Red	E	Battery (+)	Brown	5	PS+	Blue
		F	PE	Yellow/ Green	F	Battery (-)	Black	6	PS-	Purple
		B	Brake	Red	G	+5 V	Red	Enclosure	PE	-
		D	(polarity insensitive)	Black	H	GND	Orange			
					J	Shield	-			

2.4 Options

2.4.1 Peripheral Electrical Components

2.4.1.1 Fuse

To prevent accidents caused by short circuit, install a fuse on the input side of the drive.

Table 2–1 List of recommended fuses

Servo drive SV680F-INT series			Recommended Fuse		
Size	Model	Rated Input Current (A)	Manufacturer	Rated Current (A)	Model
Single-phase 200 V					
A	S1R6	2.3	Bussmann	5	FWP-5B
	S2R8	4.0		10	FWP-10B
C	S5R5	7.9		20	FWP-20B
	S7R6	9.6		20	FWP-20B
D	S012	12.8		20	FWP-20B
Three-phase 200 V					
A	S1R6	1.1	Bussmann	5	FWP-5B
	S2R8	2.3		5	FWP-5B
C	S5R5	4.4		15	FWP-15B
	S7R6	5.1		15	FWP-15B
D	S012	8.0		20	FWP-20B
E	S018	8.7		20	FWP-20B
	S022	11.0		35	FWP-35B
	S027	23.8		40	FWP-40B
Three-phase 400 V					
C	T3R5	2.4	Bussmann	5	FWP-5B
	T5R4	3.6		10	FWP-10B
D	T8R4	5.6		15	FWP-15B
	T012	8.0		20	FWP-20B
E	T017	12.0		35	FWP-35B
	T021	16.0		35	FWP-35B
	T026	21.0		40	FWP-40B

2.4.1.2 Electromagnetic contactor

Table 2–2 Recommended electromagnetic contactor models

<table>
<tr><th colspan="3">Servo drive
SV680F-INT series</th><th colspan="3">Recommended Contactor</th></tr>
<tr><th>Size</th><th>Model</th><th>Rated Input Current (A)</th><th>Manufacturer</th><th>Current (A)</th><th>Model</th></tr>
<tr><td colspan="6">Single-phase 200 V</td></tr>
<tr><td rowspan="2">A</td><td>S1R6</td><td>2.3</td><td rowspan="5">Schneider</td><td>9</td><td>LC1 D09</td></tr>
<tr><td>S2R8</td><td>4.0</td><td>9</td><td>LC1 D09</td></tr>
<tr><td rowspan="2">C</td><td>S5R5</td><td>7.9</td><td>9</td><td>LC1 D09</td></tr>
<tr><td>S7R6</td><td>9.6</td><td>12</td><td>LC1 D12</td></tr>
<tr><td>D</td><td>S012</td><td>12.8</td><td>18</td><td>LC1 D18</td></tr>
<tr><td colspan="6">Three-phase 200 V</td></tr>
<tr><td rowspan="2">A</td><td>S1R6</td><td>1.1</td><td rowspan="8">Schneider</td><td rowspan="4">9</td><td rowspan="4">LC1 D09</td></tr>
<tr><td>S2R8</td><td>2.3</td></tr>
<tr><td rowspan="2">C</td><td>S5R5</td><td>4.4</td></tr>
<tr><td>S7R6</td><td>5.1</td></tr>
<tr><td>D</td><td>S012</td><td>8.0</td><td>9</td><td>LC1 D09</td></tr>
<tr><td rowspan="3">E</td><td>S018</td><td>8.7</td><td rowspan="2">12</td><td rowspan="2">LC1 D12</td></tr>
<tr><td>S022</td><td>11.0</td></tr>
<tr><td>S027</td><td>23.8</td><td>25</td><td>LC1 D25</td></tr>
<tr><td colspan="6">Three-phase 400 V</td></tr>
<tr><td rowspan="2">C</td><td>T3R5</td><td>2.4</td><td rowspan="7">Schneider</td><td>9</td><td>LC1 D09</td></tr>
<tr><td>T5R4</td><td>3.6</td><td>9</td><td>LC1 D09</td></tr>
<tr><td rowspan="2">D</td><td>T8R4</td><td>5.6</td><td>9</td><td>LC1 D09</td></tr>
<tr><td>T012</td><td>8.0</td><td>9</td><td>LC1 D09</td></tr>
<tr><td rowspan="3">E</td><td>T017</td><td>12.0</td><td>18</td><td>LC1 D18</td></tr>
<tr><td>T021</td><td>16.0</td><td>18</td><td>LC1 D18</td></tr>
<tr><td>T026</td><td>21.0</td><td>25</td><td>LC1 D25</td></tr>
</table>

2.4.1.3 Breaker

Table 2–3 Recommended circuit breaker models

Servo drive SV680F-INT series			Recommended Circuit Breaker		
Size	Model	Rated Input Current (A)	Manufacturer	Current (A)	Model
Single-phase 200 V					
A	S1R6	2.3	Schneider	4	OSMC32N2D4
	S2R8	4.0		6	OSMC32N2D6
C	S5R5	7.9		16	OSMC32N2D16
	S7R6	9.6		16	OSMC32N2D16
D	S012	12.8		20	OSMC32N2D20
Three-phase 200 V					
A	S1R6	1.1	Schneider	4	OSMC32N3D4
	S2R8	2.3		6	OSMC32N3D6
C	S5R5	4.4		16	OSMC32N3D16
	S7R6	5.1		16	OSMC32N3D16
D	S012	8.0		16	OSMC32N3D16
E	S018	8.7		20	OSMC32N3D20
	S022	11.0		25	OSMC32N3D25
	S027	23.8		32	OSMC32N3D32
Three-phase 400 V					
C	T3R5	2.4	Schneider	4	OSMC32N3D4
	T5R4	3.6		6	OSMC32N3D6
D	T8R4	5.6		10	OSMC32N3D10
	T012	8.0		16	OSMC32N3D16
E	T017	12.0		20	OSMC32N3D20
	T021	16.0		25	OSMC32N3D25
	T026	21.0		32	OSMC32N3D32

Note

- For UL-compliant products, see *"Table 9–5 Recommended protective devices" on page 517* for recommended fuse/circuit breaker models.
- The rated current of the circuit breaker can be reduced as low as the rated current of the drive, if the load and operation conditions permit.
- This table only lists the recommended models. You can also use fuses/circuit breakers of the same specifications from other manufacturers that comply with UL North America certification.

If a residual current device (RCD) is needed, select the RCD according to the following requirements:

- Use a B-type RCD because the drive may generate DC leakage current in the protective conductor.
- For each drive, use an RCD whose tripping current is not lower than 100 mA to prevent RCD malfunction due to high-frequency leakage current generated by the drive.
- When multiple drives are connected in parallel and share one RCD, select an RCD whose tripping current is not lower than 300 mA.
- It is recommended to use Chint or Schneider RCDs.

Requirements of the common DC busbar on the circuit breaker

- Each drive in the common DC bus system must be connected to an independent circuit breaker, and the common DC bus system also needs a main circuit breaker to power on/off all drive in the common DC bus system at the same time.
- The peak current of the AC-side switching device must cover the following values:

$$I_{ac,peak}=\frac{\sqrt{2}\times V_{ac}}{R_{eq}}$$

V_{ac} is the grid input voltage with a range of 380 VAC to 480 VAC (±10%) or 200 VAC to 240 VAC (±10%).

R_{eq} is the equivalent resistance of the drive pre-charge resistor (in Ω). The pre-charge resistance under each power is shown in the following table.

Model (SV680F-INT*****)	S1R6	S2R8	S5R5	S7R6	S012	S018	S022	S027	T3R5	T5R4	T8R4	T012	T017	T021	T026
Pre-charge resistance/Ω	20	20	40	40	30	30	30	30	40	40	30	30	30	30	30

R_{eq} is calculated as follows:

$$\frac{1}{R_{eq}}=\frac{1}{R_1}+\frac{1}{R_2}+\cdots\cdots+\frac{1}{R_n}$$

R_1 to R_n are pre-charge resistances of the drives in the common bus system. If there are three drives in the common bus system, then n = 3.

2.4.1.4 AC Input Reactor

Selection

An AC input reactor is optional and mainly used to reduce harmonics in the input current. Install an external reactor as needed in actual applications. The following table lists the recommended manufacturers and models of input reactors.

Table 2–4 AC input reactor model selection

Servo drive SV680F-INT series			Applicable Reactor	Inductance (mH)
Size	Model	Rated Input Current (A)		
Three-phase 200 V				
A	S1R6	1.1	MD-ACL-10-5-4T	5
	S2R8	2.3	MD-ACL-10-5-4T	5
C	S5R5	4.4	MD-ACL-10-5-4T	5
	S7R6	5.1	MD-ACL-10-5-4T	5
D	S012	8.0	MD-ACL-10-5-4T	5
E	S018	8.7	MD-ACL-15-3-4T	3
	S022	11.0	MD-ACL-15-3-4T	3
	S027	23.8	MD-ACL-40-1.45-4T	1.45
Three-phase 400 V				
C	T3R5	2.4	MD-ACL-10-5-4T	5
	T5R4	3.6	MD-ACL-10-5-4T	5
D	T8R4	5.6	MD-ACL-10-5-4T	5
	T012	8.0	MD-ACL-10-5-4T	5
E	T017	12.0	MD-ACL-15-3-4T	3
	T021	16.0	MD-ACL-40-1.45-4T	1.45
	T026	21.0	MD-ACL-40-1.45-4T	1.45

Dimensions

- Inovance input reactors

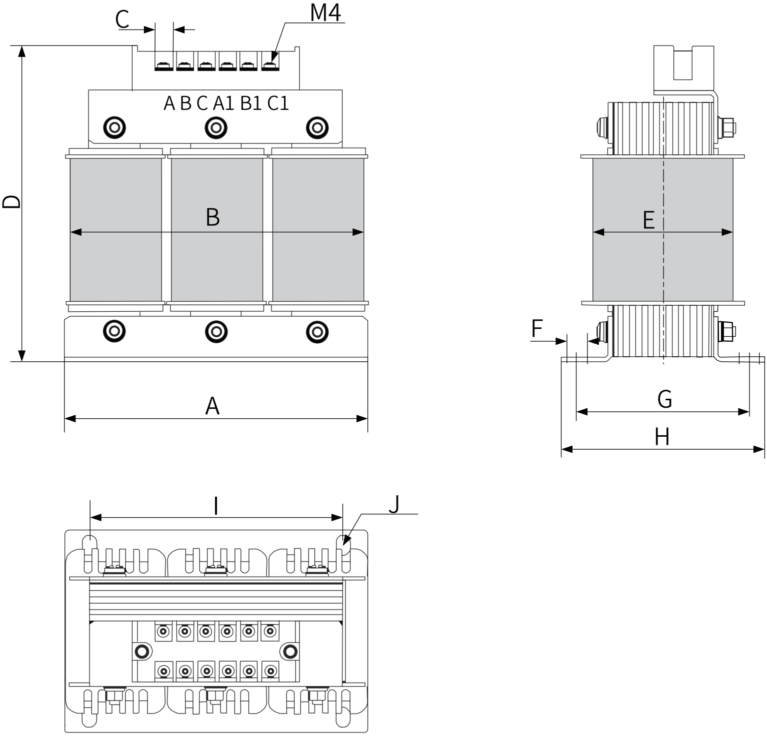


Figure 2-2 Dimensions of 10–15 A AC input reactors

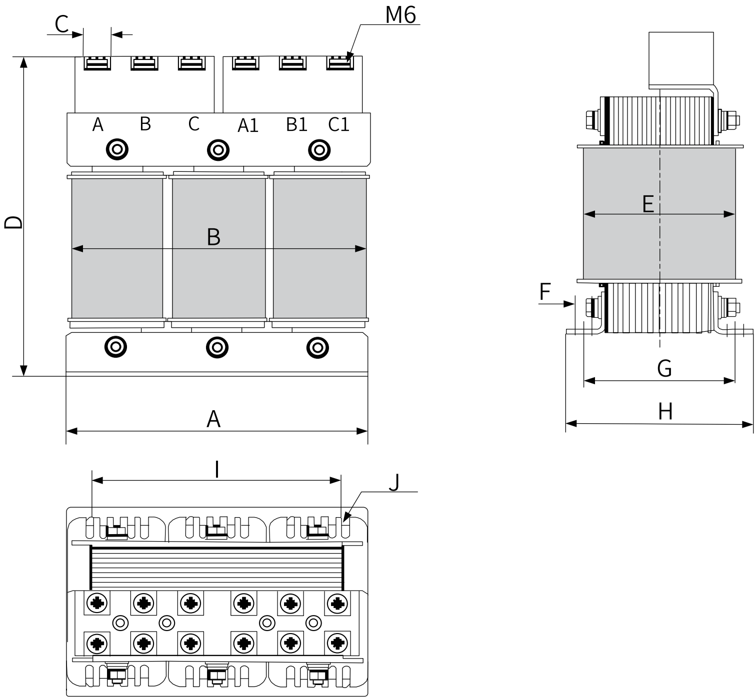


Figure 2-3 Dimensions of 40 A (1.45 mH) AC input reactors

Table 2–5 Dimensions of Inovance AC input reactors (unit: mm)

Model	A	B	C	D	E	F	G	H	I	J
MD-ACL-10-5-4T	150±2	155	8	160	80	10	85±2	100±2	125±1	Ø7 x 10
MD-ACL-15-3-4T	150±2	155	8	160	80	10	85±2	100±2	125±1	Ø7 x 10
MD-ACL-40-1.45-4T	180±2	185	16	200	105	10	95±2	117±2	150±1	Ø7 x 10

2.4.1.5 EMC filter

Selection

To comply with the radiated and conducted emission requirements of EN IEC 61800-3, install the EMC filter listed in the following table. EMC filter options are FN2090 and FN3287 series EMC filters manufactured by Schaffner. Select the EMC filter according to the rated input current of the servo drive, as shown in the following table.

Table 2–6 Standard EMC filter model and appearance

Filter Model		Appearance
Schaffner	FN2090 series	
	FN3287 series	

Table 2–7 Filter model selection (Schaffner)

Servo drive SV680F-INT series			Applicable Filter
Size	Model	Rated Input Current (A)	
Single-phase 200 V			
A	S1R6	2.3	FN 2090-3-06
	S2R8	4.0	FN 2090-4-06
C	S5R5	7.9	FN 2090-8-06
	S7R6	9.6	FN 2090-10-06
D	S012	12.8	FN 2090-16-06
Three-phase 200 V			
A	S1R6	1.1	FN 3287-10-44-C28-R65
	S2R8	2.3	FN 3287-10-44-C28-R65
C	S5R5	4.4	FN 3287-10-44-C28-R65
	S7R6	5.1	FN 3287-10-44-C28-R65
D	S012	8.0	FN 3287-10-44-C28-R65
E	S018	8.7	FN 3287-10-44-C28-R65
	S022	11.0	FN 3287-16-44-C33-R65
	S027	23.8	FN 3287-25-33-C33-R65

Servo drive SV680F-INT series			Applicable Filter
Size	Model	Rated Input Current (A)	
Three-phase 400 V			
C	T3R5	2.4	FN 3287-10-44-C28-R65
	T5R4	3.6	FN 3287-10-44-C28-R65
D	T8R4	5.6	FN 3287-10-44-C28-R65
	T012	8.0	FN 3287-10-44-C28-R65
E	T017	12.0	FN 3287-16-44-C33-R65
	T021	16.0	FN 3287-16-44-C33-R65
	T026	21.0	FN 3287-25-33-C33-R65

Dimensions

- Dimensions of Schaffner FN 2090 series filters

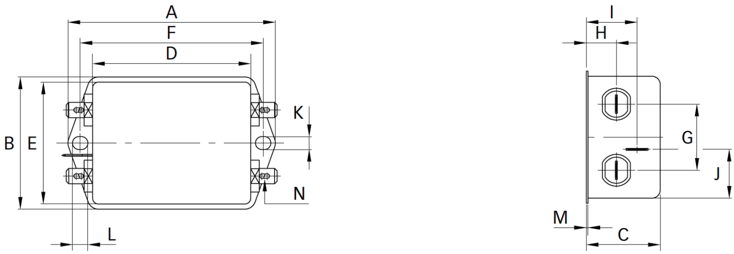


Figure 2-4 Dimensions of FN 2090 series filters (unit: mm)

Table 2–8 Dimensions of FN 2090 series filters (unit: mm)

Rated Current (A)	A	B	C	D	E	F	G	H	I	J	K	L	M	N
3	85	54	30.3	64.8	49.8	75	27	12.3	20.8	19.9	5.3	6.3	0.7	6.3×0.8
4														
6														
8	113.5±1	57.5±1	45.4±1	94±1	56	103	25	12.4	32.4	15.5	4.4	6	1	6.3×0.8

- Dimensions of Schaffner FN 3287 series filters

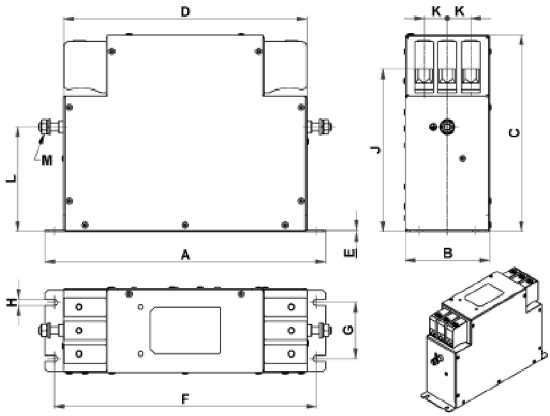


Figure 2-5 Dimension drawing of FN 3287 series filters (unit: mm)

Table 2–9 Dimensions of FN 3287 series filters (unit: mm)

Rated Current (A)	A	B	C	D	E	F	G	H	J±2	K	L±1	M
10	180	40	112	153	0.8	170	20	4.5	94	11	68	M5
16	200	45	112	170	0.8	185	25	5.4	102	11	76	M5
25	205	45	132	173	0.8	190	25	5.4	113	13	83	M5

2.4.1.6 Magnetic Ring and Ferrite Clamp

The magnetic ring is intended to be installed on the input or output side of the drive. Install the magnetic ring as close to the drive as possible. Installing the magnetic ring on the input side can suppress the noise in the input power supply system of the drive. When it is installed on the output side, it can reduce the interference generated by the drive to external devices and the bearing current.

In applications with leakage current and signal cable interference, install a magnetic ring or a ferrite clamp.

Selection

- Amorphous magnetic ring: featuring a high permeability within 1 MHz and excellent anti-interference performance, but not as low-cost as the ferrite clamp. See *" Dimensions" on page 40* for details..
- Ferrite clamp: featuring a good interference suppression performance within a frequency band above 1MHz, applicable to low-power servo drives and signal cables, low-cost and easy to install

Magnetic Ring and Ferrite Clamp		Appearance
Magnetic ring	DY644020H	
	DY805020H	
Ferrite clamp	DYR-130-B	

Dimensions

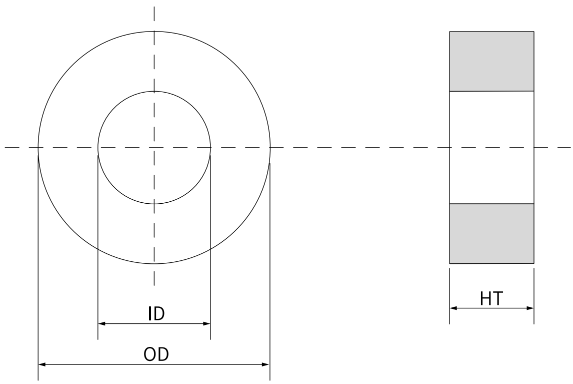


Figure 2-6 Dimensions of the magnetic ring

Table 2–10 Dimensions of the magnetic ring

Model	Dimension (OD x ID x HT) (mm)
DY644020H	64 x 40 x 20
DY805020H	80 x 50 x 20

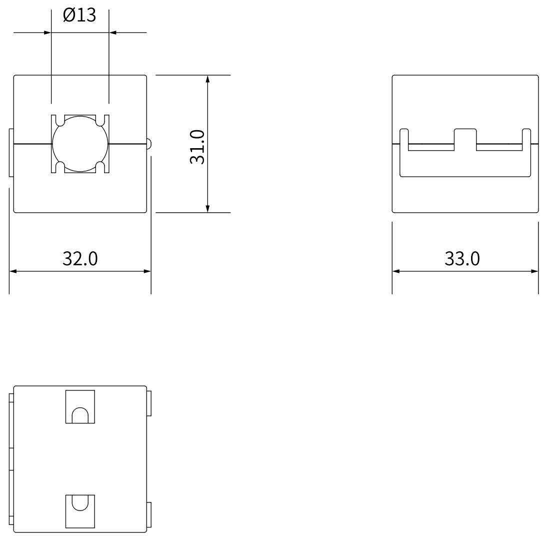


Figure 2-7 Dimensions of the ferrite clamp

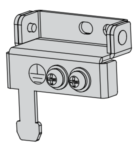
Table 2–11 Dimensions of the ferrite clamp

Model	Size (Length × OD × ID) (mm)
DYR-130-B	32.0 x 31 x 13

2.4.2 Shield Bracket

To reduce electromagnetic interference, a shield bracket and clamp are used with the drive cables.

Table 2–12 Shield Bracket

Model	Outline Drawing
S6-C25 (optional for SIZE A to SIZE C)	
S6-C27 (optional for SIZE D to SIZE E)	

Note

For instructions of installing the shield bracket, see *"3.4.5 Instructions for Installing the Shield Bracket" on page 77*.

2.4.3 Absolute Encoder Batteries

Selection

Select an appropriate battery according to the following table.

Table 2–13 Description of the absolute encoder battery

Specification	Item	Rating			Condition
		Min.	Typical Value	Max.	
Output: 3.6 V, 2700 mAh	External battery voltage (V)	3.2	3.6	3.8	In standby state[1]
	Circuit fault voltage (V)	-	2.6	-	In standby state
	Battery alarm voltage (V)	2.85	3	3.15	-
	Current consumed by the circuit (uA)	-	2	-	In normal operation[2]
		-	10	-	In standby state, shaft at standstill
		-	300	-	In standby state, shaft rotating
	Ambient temperature (°C)	0	-	40	Same as the motor.
	Storage temperature (°C)	0	-	30	

The preceding values are obtained under an ambient temperature of 20°C.

Note

- [1]: The "standby state" means the encoder counts the multi-turn data by using the power from the external battery when the servo drive power supply is not switched on. In this case, data transceiving stops.
- [2]: During normal operation, the absolute encoder supports one-turn or multi-turn data counting and transceiving. Power on the servo drive after connecting the absolute encoder properly. The encoder starts data transceiving after a short delay of about 5s upon power-on. The motor speed must be lower than or equal to 10 rpm during transition from the standby state to the normal operation state (upon power-on). Otherwise, Er.740 (Encoder fault) may occur. In this case, you need to power off and on the servo drive again.

2.4.4 Braking resistor

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

Table 2–14 Specifications of the braking resistor

<table>
<tr><th rowspan="2">Servo Drive Model</th><th colspan="3">Specifications of Built-in Braking Resistor</th><th rowspan="2">Min. Permissible Resistance of External Braking Resistor (Ω) (H02.21)</th></tr>
<tr><th>Resistance (Ω)</th><th>Power (Pr) (W)</th><th>Processing Power (Pa) (W)</th></tr>
<tr><td>S1R6</td><td>-</td><td>-</td><td>-</td><td rowspan="3">40</td></tr>
<tr><td>S2R8</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>S5R5</td><td>50</td><td>50</td><td>40</td></tr>
<tr><td>S7R6</td><td rowspan="2">25</td><td rowspan="2">80</td><td rowspan="2">64</td><td>20</td></tr>
<tr><td>S012</td><td>15</td></tr>
<tr><td>S018</td><td rowspan="3">20</td><td rowspan="3">100</td><td rowspan="3">80</td><td rowspan="3">20</td></tr>
<tr><td>S022</td></tr>
<tr><td>S027</td></tr>
<tr><td>T3R5</td><td>100</td><td rowspan="4">80</td><td rowspan="4">64</td><td>80</td></tr>
<tr><td>T5R4</td><td>100</td><td>60</td></tr>
<tr><td>T8R4</td><td rowspan="2">50</td><td>45</td></tr>
<tr><td>T012</td><td>40</td></tr>
<tr><td>T017</td><td rowspan="3">35</td><td rowspan="3">100</td><td rowspan="3">80</td><td>35</td></tr>
<tr><td>T021</td><td rowspan="2">25</td></tr>
<tr><td>T026</td></tr>
</table>

Note

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

The kinetic energy generated upon braking of a reciprocating motor is converted into electric energy that fed back to the bus capacitor. When the bus voltage rises above the braking voltage threshold, the braking resistor starts consuming the excessive energy fed back by the motor. The motor speed curve is as shown in *"Figure 2–8 " on page 44* .

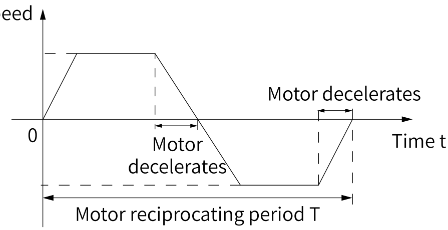


Figure 2-8 Motor speed curve

Energy calculation

The built-in braking resistor is not available in S1R6 and S2R8 models. Capacitors are used to sore energy. An external braking resistor is needed when the rotational energy of the motor and the load exceeds the values listed in the following table.

Drive Model	Regenerative Energy Can Be Absorbed (W)	Remarks
S1R6	13.15	The input voltage of the main circuit power supply is 220 VAC.
S2R8	26.29	

- The following table shows the energy generated by a 200 V motor in decelerating from the rated speed to a standstill during no-load operation.

Table 2–15 200 V motor energy data

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (kgm^2)	EO Generated During Decelerating from Rated Speed to a Standstill (J)	Max. Braking Energy Absorbed by the Capacitor E_C (J)
0.05	MS1H1-05B30CB-**31R-INT MS1H1-05B30CB-**34R-INT	0.026×10^4 (0.028×10^4)	0.13 (0.14)	9.3
0.1	MS1H1-10B30CB-**31R-INT MS1H1-10B30CB-**34R-INT	0.041×10^4 (0.043×10^4)	0.20 (0.21)	9.3
0.2	MS1H1-20B30CB-**31R-INT MS1H1-20B30CB-**34R-INT	0.0938×10^4 (0.106×10^4)	0.46 (0.52)	9.3
0.4	MS1H1-40B30CB-**31R-INT MS1H1-40B30CB-**34R-INT	0.145×10^4 (0.157×10^4)	0.72 (0.78)	18.59
0.55	MS1H1-55B30CB-**31R-INT	0.55×10^4	2.72	32.42
0.75	MS1H1-75B30CB-**31R-INT MS1H1-75B30CB-**34R-INT	0.68×10^4 (0.71×10^4)	3.36 (3.51)	32.42
1	MS1H1-10C30CB-**31R-INT MS1H1-10C30CB-**34R-INT	0.82×10^4 (0.87×10^4)	4.05 (4.30)	32.42
1	MS1H2-10C30CB-**31R-INT MS1H2-10C30CB-**34R-INT	1.78×10^4 (2.6×10^4)	8.80 (12.86)	32.42
1.5	MS1H2-15C30CB-**31R-INT MS1H2-15C30CB-**34R-INT	2.35×10^4 (3.17×10^4)	11.6 (15.68)	47.68
2.0	MS1H2-20C30CB-**31R-INT MS1H2-20C30CB-**34R-INT	2.92×10^4 (3.74×10^4)	14.44 (18.49)	78.19
2.5	MS1H2-25C30CB-**31R-INT MS1H2-25C30CB-**34R-INT	3.49×10^4 (4.3×10^4)	17.26 (21.26)	114.43
3.0	MS1H2-30C30CB-**31R-INT MS1H2-30C30CB-**34R-INT	6.4×10^4 (9.38×10^4)	31.65 (46.38)	114.43
4.0	MS1H2-40C30CB-**31R-INT MS1H2-40C30CB-**34R-INT	9×10^4 (11.98×10^4)	44.51 (59.24)	114.43
5.0	MS1H2-50C30CB-**31R-INT MS1H2-50C30CB-**34R-INT	11.6×10^4 (14.58×10^4)	57.36 (72.10)	114.43
0.85	MS1H3-85B15CB-**31R-INT MS1H3-85B15CB-**34R-INT	13.56×10^4 (15.8×10^4)	16.45 (17.3)	32.42
1.3	MS1H3-13C15CB-**31R-INT MS1H3-13C15CB-**34R-INT	19.25×10^4 (21.5×10^4)	22 (22.86)	47.68
1.8	MS1H3-18C15CB-**31R-INT MS1H3-18C15CB-**34R-INT	24.9×10^4 (27.2×10^4)	30.78 (33.63)	78.19
2.9	MS1H3-29C15CB-**31R-INT MS1H3-29C15CB-**34R-INT	44.7×10^4 (52.35×10^4)	55.26 (64.72)	114.43
4.4	MS1H3-44C15CB-**31R-INT MS1H3-44C15CB-**34R-INT	64.9×10^4 (72.55×10^4)	80.23 (89.69)	114.43
0.1	MS1H4-10B30CB-**31R-INT MS1H4-10B30CB-**34R-INT	0.102×10^4 (0.104×10^4)	0.50 (0.51)	9.3
0.2	MS1H4-20B30CB-**31R-INT MS1H4-20B30CB-**34R-INT	0.22×10^4 (0.23×10^4)	1.09 (1.14)	9.3

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (kgm^2)	EO Generated During Decelerating from Rated Speed to a Standstill (J)	Max. Braking Energy Absorbed by the Capacitor E_C (J)
0.4	MS1H4-40B30CB-**31R-INT MS1H4-40B30CB-**34R-INT	0.43×10^4 (0.44×10^4)	2.13 (2.18)	18.59
0.55	MS1H4-55B30CB-**31R-INT	1.12×10^4	5.54	32.42
0.75	MS1H4-75B30CB-**31R-INT MS1H4-75B30CB-**34R-INT	1.46×10^4 (1.51×10^4)	7.22 (7.47)	32.42
1.0	MS1H4-10C30CB**31R-INT MS1H4-10C30CB**34R-INT	1.87×10^4 (1.97×10^4)	9.25 (9.74)	32.42

- The following table shows the energy generated by a 400 V motor in decelerating from the rated speed to a standstill during no-load operation.

Table 2–16 400 V motor energy data

Capacity (kW)	Servo Motor Model MS1H*-*******-*****	Rotor Inertia J (kgm^2)	Braking Energy E_O (J) Generated During Operation	Max. Braking Energy Absorbed by the Capacitor E_C (J)
1.0	MS1H2-10C30CD-**31R-INT MS1H2-10C30CD-**34R-INT	1.78×10^4 (2.6×10^4)	8.8 12.86	36.06
1.5	MS1H2-15C30CD-**31R-INT MS1H2-15C30CD-**34R-INT	2.35×10^4 (3.17×10^4)	11.62 (15.68)	43.79
2.0	MS1H2-20C30CD-**31R-INT MS1H2-20C30CD-**34R-INT	2.92×10^4 (3.74×10^4)	14.44 (18.49)	64.40
2.5	MS1H2-25C30CD-**31R-INT MS1H2-25C30CD-**34R-INT	3.49×10^4 (4.3×10^4)	17.26 (21.26)	64.40
3.0	MS1H2-30C30CD-**31R-INT MS1H2-30C30CD-**34R-INT	6.4×10^4 (9.38×10^4)	31.65 (46.38)	64.40
4.0	MS1H2-40C30CD-**31R-INT MS1H2-40C30CD-**34R-INT	9×10^4 (11.98×10^4)	44.51 (59.24)	105.62
5.0	MS1H2-50C30CD-**31R-INT MS1H2-50C30CD-**34R-INT	11.6×10^4 (14.58×10^4)	57.36 (72.10)	154.56
0.85	MS1H3-85B15CD-**31R-INT MS1H3-85B15CD-**34R-INT	13.56×10^4 (15.8×10^4)	16.76 (19.53)	36.06
1.3	MS1H3-13C15CD-**31R-INT MS1H3-13C15CD-**34R-INT	19.25×10^4 (21.5×10^4)	23.8 (26.58)	43.79
1.8	MS1H3-18C15CD-**31R-INT MS1H3-18C15CD-**34R-INT	24.9×10^4 (27.2×10^4)	30.78 (33.63)	64.40
2.9	MS1H3-29C15CD-**31R-INT MS1H3-29C15CD-**34R-INT	44.7×10^4 (52.35×10^4)	55.26 (64.72)	64.40
4.4	MS1H3-44C15CD-**31R-INT MS1H3-44C15CD-**34R-INT	64.9×10^4 (72.55×10^4)	80.23 (89.69)	105.62
5.5	MS1H3-55C15CD-**31R-INT MS1H3-55C15CD-**34R-INT	86.9×10^4 (94.55×10^4)	107.43 (116.89)	154.56
7.5	MS1H3-75C15CD-**31R-INT MS1H3-75C15CD-**34R-INT	127.5×10^4 (135.15×10^4)	157.62 (167.08)	154.56

Note

- ** indicates the encoder type, which can be A3 (23-bit multi-turn absolute encoder), A6 (26-bit multi-turn absolute encoder) or S6 (26-bit multi-turn absolute encoder of functional safety type).
- Values inside the parentheses "()" are for the motor with brake.

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

Selection of the braking resistor for a servo rotary motor

- **Without external load torque**

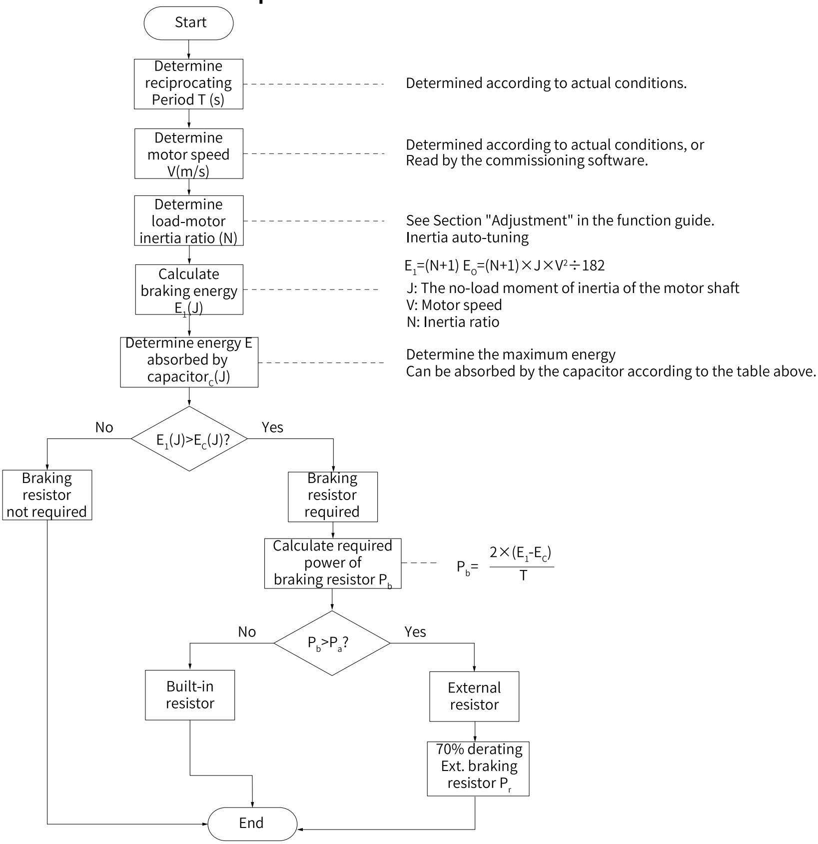


Figure 2-9 Flowchart for selecting the braking resistor

Note

- Take the process in which the motor decelerates from 3000 RPM to 3000 RPM as an example, suppose the load inertia is N times the motor inertia, then the braking energy is (N+1) x E_O when the motor decelerates from 3000 RPM to 3000 RPM, and the energy consumed by the braking resistor is (N+1) x EO - EC (EC represents the energy absorbed by the capacitor). The energy consumed by the braking resistor is (N + 1) x E_O - E_C (E_C represents the energy absorbed by the capacitor). Suppose the reciprocating cycle is T, then the power of the braking resistor needed is 2 x [(N + 1) x E_O - E_C]/T. See *"Table 2–15 200 V motor energy data" on page 45* and *"Table 2–16 400 V motor energy data" on page 46* for values of E_O and E_C .
- Determine whether to use the braking resistor according to the preceding figure and select a built-in or an external braking resistor as needed. Then, set H02.25 accordingly.
- The resistor with aluminum case is recommended.

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

$$P_b = \frac{2\times[(N+1)\times E_O - E_C]}{T} = \frac{2\times[(4+1)\times 6.824-32.422]}{2} = 1.698W$$

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

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

$$P_b = \frac{2\times[(N+1)\times E_O - E_C]}{T} = \frac{2\times[(10+1)\times 6.824-32.422]}{2} = 42.642W$$

The calculated result is larger than the processing capacity (Pa = 40 W) of the built-in braking resistor, so an external braking resistor is needed. so an external braking resistor is required. The recommended power of the external braking resistor is Pb/(1 – 70%) = 142.14W.

☆ Related parameters:

Parameter	Communication Address	Name	Value	Default	Unit	Change Mode	Page
H02.21	0x0215	Permissible minimum resistance of braking resistor	1Ω to 1000Ω	40	Ω	Unchangeable	" H02_en.21" on page 163
H02.24	0x0218	Resistor heat dissipation coefficient	10% to 100%	30	%	Real-time	" H02_en.24" on page 164
H02.25	0x0219	Braking resistor type	0: Built-in 1: External, natural cooling 2: External, forced air cooling 3: No resistor needed	3	-	Real-time	" H02_en.25" on page 164
H02.26	0x021A	Power of external braking resistor	1 W–65535 W	40	W	Real-time	" H02_en.26" on page 165
H02.27	0x021B	Resistance of external braking resistor	15Ω to 1000Ω	50	Ω	Real-time	" H02_en.27" on page 165

- Braking resistor not needed
  When $E_1 < E_C$, the braking resistor is not needed because the braking energy can be absorbed by the bus capacitor. In this case, set H02.25 to 3.

- Using the built-in braking resistor
  When $P_b < P_a$ and $E_1 > E_C$, use the built-in braking resistor. In this case, set H02.25 to 0.

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

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

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

  Cable specifications of the external braking resistor: For CE, see "9.1.3 Cable Specifications (CE)" on page 512. For UL, see "9.1.3 Cable Specifications (CE)" on page 512. Set H02.25 to 1 or 2 based on the cooling mode of the braking resistor. Check and set the following parameters.

  ☆ Related parameters:

Parameter	Communication Address	Name	Value	Default	Unit	Change Mode	Page
H02.21	0x0215	Permissible minimum resistance of braking resistor	1Ω to 1000Ω	40	Ω	Unchangeable	" H02_en.21" on page 163
H02.25	0x0219	Braking resistor type	0: Built-in 1: External, natural cooling 2: External, forced air cooling 3: No resistor needed	3	-	Real-time	" H02_en.25" on page 164
H02.26	0x021A	Power of external braking resistor	1 W–65535 W	40	W	Real-time	" H02_en.26" on page 165
H02.27	0x021B	Resistance of external braking resistor	15Ω to 1000Ω	50	Ω	Real-time	" H02_en.27" on page 165

Caution

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

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

☆ Related parameters:

Parameter	Communication Address	Name	Value	Default	Unit	Change Mode	Page
H02.24	0x0218	Resistor heat dissipation coefficient	10% to 100%	30	%	Real-time	" H02_en.24" on page 164

Note

Higher resistor heat dissipation coefficient indicates higher braking efficiency.

- **External load torque applied, motor in generating state**

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

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

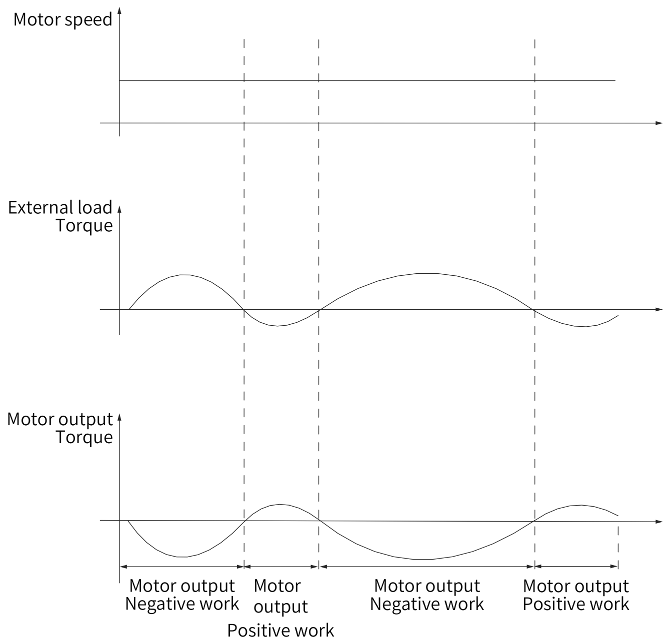


Figure 2-10 Example of the curve with external load torque

Take the H1 series 750 W model (rated torque 2.39 N·m) as an example. When the external load torque is 60% of the rated torque and the motor speed is 1500 RPM, the power pumped back to the drive is: (60% x 2.39) x (1500 x 2π/60) = 225 W. As the braking resistor is derated by 70%, and therefore, the power of the external braking resistor is: 225/(1 – 70%) = 750 W, with resistance 50 Ω

2.5 Cables

2.5.1 Power cable

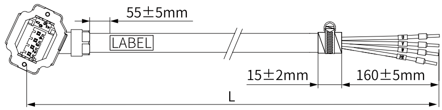
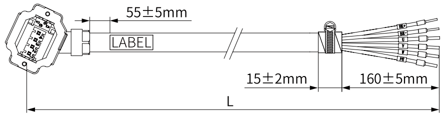
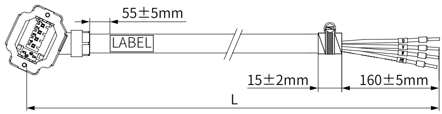
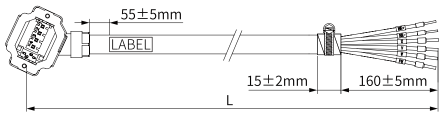
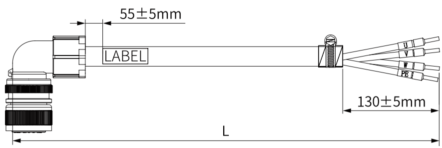
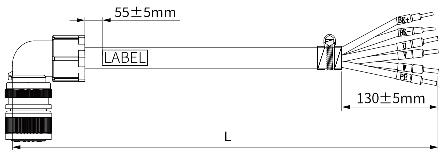
Power Cable Model

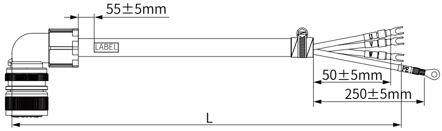
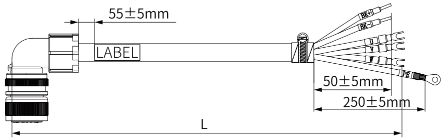
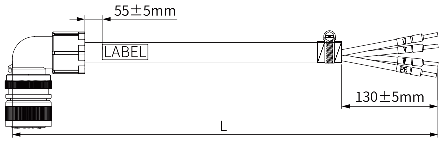
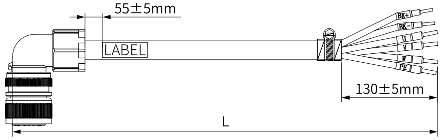
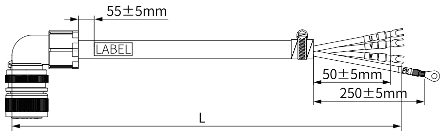
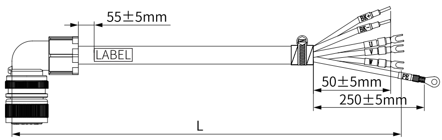
S6-L-M - 0 0 1 - 3.0 - T - INT

① ② ③ ④ ⑤ ⑥ ⑦

1	**Cable Type** S6-L-B/M: motion control power cable B: with brake M: without brake	3	**Motor Power** 0: 40/60/80 mm frames 1: 100/130/180 mm frames 2: 180 mm frames (4.4 kW and above)	5	**Cable Length (m)** 3.0: 3 5.0: 5 10.0: 10
2	**Connector type at drive side** 0: Spade tongue terminal 1: Pin terminal	4	**Connector type at motor side** 1: 9-core military-spec connector 2: 6-core military-spec connector 7: SDC-06T series connector (front outgoing) 8: SDC-06T series connector (rear outgoing)	6	**Special requirements** _: Fixed cable T: Drag chain ≥ 10 million times
				7	**Version** INT: global version

List of power cables

Motor Model		Cable Model	Cable Length (mm)	Illustration
MS1H1/ MS1H4 motor	Power cable for motor without brake (Front outlet)	S6-L-M107-3.0(-T)-INT	3000	
		S6-L-M107-5.0(-T)-INT	5000	
		S6-L-M107-10.0(-T)-INT	10000	
	Brake (Front outlet)	S6-L-B107-3.0(-T)-INT	3000	
		S6-L-B107-5.0(-T)-INT	5000	
		S6-L-B107-10.0(-T)-INT	10000	
	Power cable for motor without brake (Rear outlet)	S6-L-M108-3.0(-T)-INT	3000	
		S6-L-M108-5.0(-T)-INT	5000	
		S6-L-M108-10.0(-T)-INT	10000	
	Brake (Rear outlet)	S6-L-B108-3.0(-T)-INT	3000	
		S6-L-B108-5.0(-T)-INT	5000	
		S6-L-B108-10.0(-T)-INT	10000	
MS1H2 motor rated 3 kW or below/ MS1H3 motor rated 1.8 kW or below	Power cable for motor without brake	S6-L-M111-3.0(-T)-INT	3000	
		S6-L-M111-5.0(-T)-INT	5000	
		S6-L-M111-10.0(-T)-INT	10000	
	Brake	S6-L-B111-3.0(-T)-INT	3000	
		S6-L-B111-5.0(-T)-INT	5000	
		S6-L-B111-10.0(-T)-INT	10000	

Motor Model		Cable Model	Cable Length (mm)	Illustration
MS1H2 motors (4 kW/5 kW)	Power cable for motor without brake	S6-L-M011-3.0(-T)-INT	3000	
		S6-L-M011-5.0(-T)-INT	5000	
		S6-L-M011-10.0(-T)-INT	10000	
	Brake	S6-L-B011-3.0(-T)-INT	3000	
		S6-L-B011-5.0(-T)-INT	5000	
		S6-L-B011-10.0(-T)-INT	10000	
MS1H3 motors (2.9 kW)	Power cable for motor without brake	S6-L-M112-3.0(-T)-INT	3000	
		S6-L-M112-5.0(-T)-INT	5000	
		S6-L-M112-10.0(-T)-INT	10000	
	Brake	S6-L-B112-3.0(-T)-INT	3000	
		S6-L-B112-5.0(-T)-INT	5000	
		S6-L-B112-10.0(-T)-INT	10000	
MS1H3 (4.4 kW and above)	Power cable for motor without brake	S6-L-M022-3.0(-T)-INT	3000	
		S6-L-M022-5.0(-T)-INT	5000	
		S6-L-M022-10.0(-T)-INT	10000	
	Brake	S6-L-B022-3.0(-T)-INT	3000	
		S6-L-B022-5.0(-T)-INT	5000	
		S6-L-B022-10.0(-T)-INT	10000	

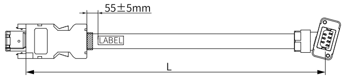
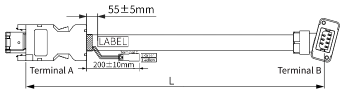
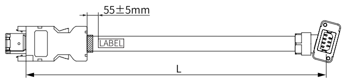
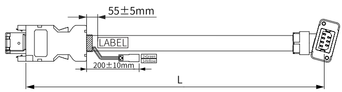
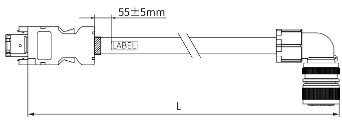
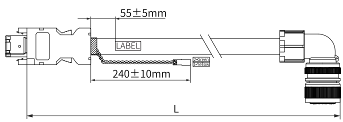
2.5.2 Encoder cable

Encoder Cable Model

S6-L-P - 1 2 1 - 3.0 - T - INT
① ② ③ ④ ⑤ ⑥ ⑦

1 **Cable Type** S6-L-P: encoder cable	3 **Encoder** 1: Communication incremental encoder 2: Multi-turn absolute	5 **Cable Length (m)** 3.0: 3 5.0: 5 10.0: 10
2 **Connector type at drive side** 1: USB	4 **Connector type at motor side** 1: 9-core military-spec connector 4: SDC-06T series connector (front outgoing) 5: SDC-06T series connector (rear outgoing)	6 **Special requirements** _: Fixed cable T: Drag chain ⩾ 10 million times 7 **Version** INT: global version

List of encoder cables

Motor Model			Cable Model	Cable Length (mm)	Illustration
MS1H1/ MS1H4 terminal-type motor	Front outlet	Single-turn absolute encoder	S6-L-P114-3.0(-T)-INT	3000	
			S6-L-P114-5.0(-T)-INT	5000	
			S6-L-P114-10.0(-T)-INT	10000	
		Multi-turn absolute encoder	S6-L-P124-3.0(-T)-INT	3000	
			S6-L-P124-5.0(-T)-INT	5000	
			S6-L-P124-10.0(-T)-INT	10000	
	Rear outlet	Single-turn absolute encoder	S6-L-P115-3.0(-T)-INT	3000	
			S6-L-P115-5.0(-T)-INT	5000	
			S6-L-P115-10.0(-T)-INT	10000	
		Multi-turn absolute encoder	S6-L-P125-3.0(-T)-INT	3000	
			S6-L-P125-5.0(-T)-INT	5000	
			S6-L-P125-10.0(-T)-INT	10000	
MS1H2/ MS1H3 motor	Single-turn absolute encoder		S6-L-P111-3.0(-T)-INT	3000	
			S6-L-P111-5.0(-T)-INT	5000	
			S6-L-P111-10.0(-T)-INT	10000	
	Multi-turn absolute encoder		S6-L-P121-3.0(-T)-INT	3000	
			S6-L-P121-5.0(-T)-INT	5000	
			S6-L-P121-10.0(-T)-INT	10000	

2.5.3 Communication Cable

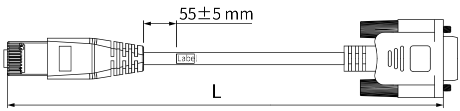
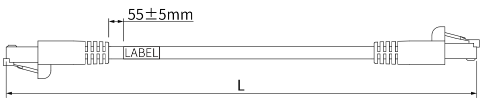
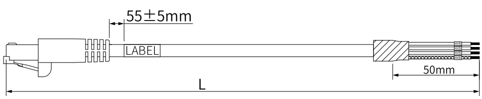
Model number of communication cables

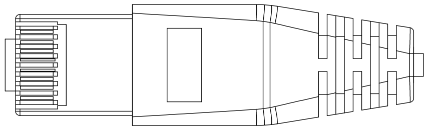
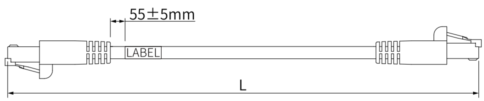
S6-L-T - 02 - 0.3

① ② ③

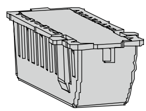
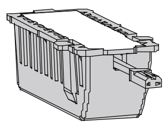
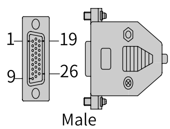
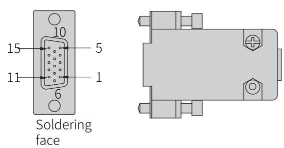
1 **Cable Type** S6-L-T: Motion control communication cable	2 **Cable type** 00: Servo drive PC communication cable 01: Servo drive multi-drive communication cable (CAN&RS485) 02: Drive-PLC communication cable 03: Servo drive communication termination resistor cable (CAN&RS485) 04: Servo drive network communication cable (CAT.5E) 07: Servo drive network communication cable (CAT6A) 08: Servo drive network communication cable (CAT7)	3 **Cable Length (m)** 0.3: 0.3 2.0: 2 ...

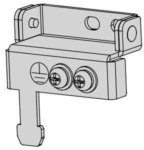
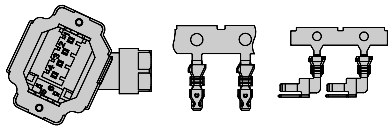
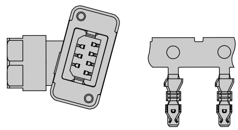
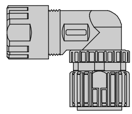
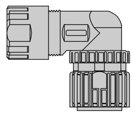
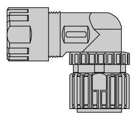
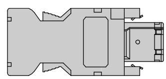
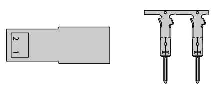
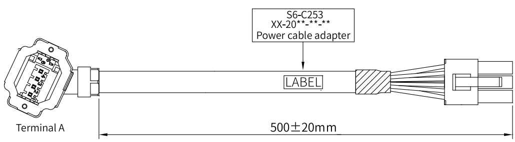
List of communication cables

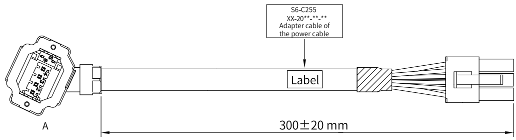
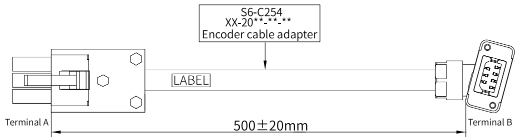
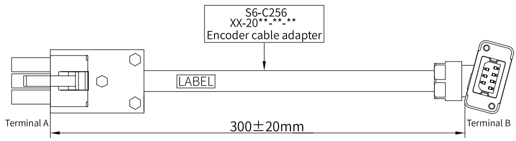
Cable Name	Cable Model	Cable Length (mm)	Illustration
Drive-PC communication cable	S6-L-T00-3.0	3000	
Servo drive multi-drive communication cable (CAN&RS485)	S6-L-T01-0.3	300	
Drive-PLC communication cable	S6-L-T02-2.0	2000	

Cable Name	Cable Model	Cable Length (mm)	Illustration
Servo drive communication termination resistor cable connector (CAN&RS485)	S6-L-T03-0.0	-	
Servo drive network communication cable (CAT.5E)	S6-L-T04-0.3	300	
Servo drive network communication cable (CAT6A)	S6-L-T07-0.3	300	
Servo drive network communication cable (CAT7)	S6-L-T08-0.3	300	

2.6 Connector Kit

Cable Name	Cable Model	Illustration
Battery box kit (without battery)	S6-C4A-NB	
Battery kit	S6-C4A	
CN1 terminal (DB26)	S6-C74	
CN7 terminal (DB15)	S6-C6	

Cable Name	Cable Model	Illustration
Shield Bracket	S6-C25 (optional for SIZE A–SIZE C) S6-C27 (optional for SIZE D to SIZE E)	
Motor side power connector below 750 W	S6-C246	
Motor side encoder connector below 750 W	S6-C247	
Motor side 100–130 frame power connector above 1000 W	S6-C248	
Motor side 180 frame power connector above 1000 W	S6-C249	
Motor side encoder connector above 1000 W	S6-C250	
CN2 (1394)	S6-C251	
Battery box connector	S6-C252	
500 mm motor side power lead cable below 750 W	S6-C253	

Cable Name	Cable Model	Illustration
300 mm motor side power lead cable below 750 W	S6-C255	
500 mm motor side encoder lead cable below 750 W	S6-C254	
300 mm motor side encoder lead cable below 750 W	S6-C256	

2.7 Selection of Terminal Accessory Kit

Material Code	Name
SV680F-INT-standard	
98050833	Accessories (sale)-S6-C173-1-SV680N Size A terminal accessory kit
98050837	Accessories (sale)-S6-C174-1-SV680N Sizes C&D terminal accessory kit
98050847	Accessories (sale)-S6-C175-1-SV680N Size E terminal accessory kit

Note

SV680F-GINT and SV680N-INT products share the same terminal kit.

3 Installation

3.1 Unpacking Inspection

Check the following items upon unpacking.

Item	Description
Check whether the delivered product is consistent with your order.	Check whether the servo drive model and specifications comply with your order. See the dimensions of the packing box in *"Table 3–1 " on page 61*. The deliverables include the product, cushion, carton box, and screw bag, as shown in *"Figure 3–1 " on page 62* .
Check whether the product is intact.	Check whether the product delivered is in good condition. If there is any missing or damage, contact your supplier immediately.

Table 3–1 Dimensions of the outer packing box

Size	Model SV680F-INT Series Servo Drive	Outer Width (mm)	Outer Height (mm)	Outer Depth (mm)	Mass (kg)
A	S1R6, S2R8	240	193	85	1.13
C	S5R5, S7R6, T3R5, T5R4	230	223	95	1.5
D	S012, T8R4, T012	240	223	125	2.0
E	S018, S022, S027, T017, T021, T026	325	285	145	3.9

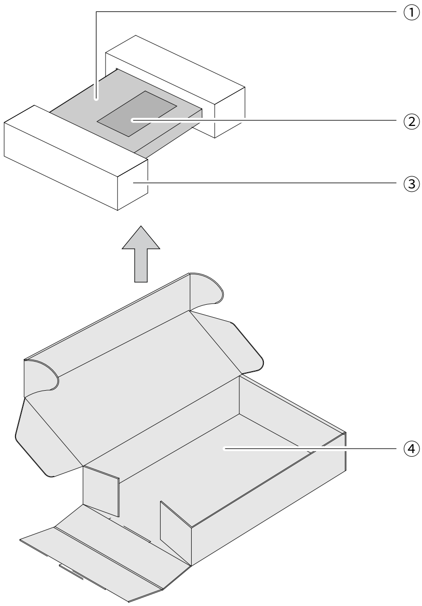
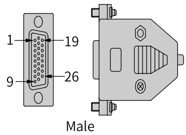
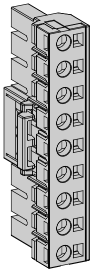
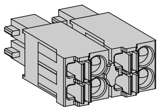
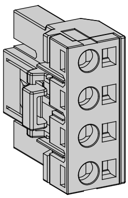
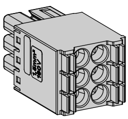
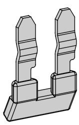
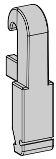


Figure 3-1 Contents inside the packing box

No.	Name
1	Product
2	Terminal accessory package
3	Cushion
4	Carton box

Table 3–2 Terminal accessory package list

Material Code	Diagram	Name
1504CK54		Cable set–servo drive S6–C74–DB26 connector kit (RoHS)
15210577		Plug-in terminal block-plug-spring clamp wiring-9P-black-with safety lock
15210648		Plug-in terminal block-plug-spring clamp wiring-2*2P-black-printing on both sides
15210695		Plug-in terminal block-plug-spring clamp wiring-4P-black
15211052		Plug-in terminal block-plug-spring clamp wiring-3.5mm-2*3P-black-180°-screen printed-RoHS
15220274		Jumper bar-16A-pluggable bridge

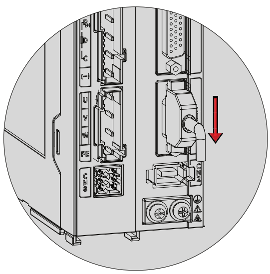
Material Code	Diagram	Name
19024735	-	Labels-labels for servo drive terminals
2120021		Plastic parts-plug wiring key-for use with servo drive power plug

If you need to purchase the terminal accessory package separately, please contact Inovance. For the material code of the accessory package for each model, see *"2.7 " on page 60*.

3.2 Precautions

- Observe the installation direction described in this manual. Failure to comply may result in equipment fault or damage.
- Do not install or operate damaged or defective equipment. Failure to comply will result in personal injury.
- Do not install the equipment in environments exposed to water splashes or corrosive gases. Failure to comply will result in equipment fault.
- Do not install the equipment near inflammable gases or combustible objects. Failure to comply will result in a fire or electric shock.
- Install the equipment inside a fire-proof cabinet that provides electrical protection. Failure to comply may result in a fire.
- Ensure the specified clearance is reserved among the drive, the interior surface of the control cabinet, and other machines. Failure to comply will result in a fire or equipment fault.
- Do not put heavy objects on the equipment. Failure to comply may result in personal injury or equipment damage.
- Do not impose large impact on the equipment. Failure to comply may result in equipment damage.
- Do not block the air inlet/outlet of the equipment or allow unwanted objects to fall into the equipment. Failure to comply may result in a fire or equipment fault.

Table 3–3 Installation Precautions

Item	Description
Installation Method	• Install the servo drive vertically and upward to facilitate heat dissipation. For installation of multiple servo drives inside the cabinet, install them side by side. For dual-row installation, install an air guide plate. • Make sure the servo drive is installed vertically to the wall. Cool the servo drive down with natural convection or a cooling fan. Secure the servo drive to the mounting surface through two to four mounting holes (the number of mounting holes depends on the capacity of the servo drive). • Install the servo drive vertically to the wall, with its front (actual mounting face) facing the operator. • The mounting bracket (if needed) must be made of incombustible materials.
Cooling	As shown in *"3.3.2 Installation Clearance" on page 67*, reserve sufficient space around the servo drive to ensure a good heat dissipation through the cooling fan or natural convection. Take the heat dissipated by other devices inside the cabinet into consideration. Install a cooling fan to the upper part of the servo drive to avoid excessive temperature rise in a certain area, keeping an even temperature inside the control cabinet.
Grounding	Ground the grounding terminal properly. Failure to comply may result in electric shock or malfunction due to interference.
Wiring requirements	As shown in the figure below, route the servo drive cables downwards to prevent liquid from flowing into the servo drive along the cables.  Route the cable connected downwards.

3.3 Installation of the Servo Drive

3.3.1 Installation Environment Requirements

Table 3–4 Environment requirements

Item	Requirement
Installation location	Indoor
Grid overvoltage	Overvoltage category (OVC) III
Altitude	The maximum altitude is 2000 m. • For altitudes not higher than 1000 m, derating is not required • Derating is required for altitudes above 1000 m (derate 1% for every additional 100 m) • For altitudes above 2000 m, contact Inovance.
Temperature	• Mounting/Operating temperature: 0°C to +55°C For temperatures between 0°C to 45°C, derating is not required. For temperatures above 45°C, derate 2% for every additional 1°C. • Storage/Transportation temperature: -40°C to +70°C. • To improve the reliability of the machine, use the servo drive in environments without dramatic temperature change. • When installing the servo drive into an enclosed environment such as a control cabinet, use a cooling fan or air conditioner to keep the temperature of the inlet air below 45°C. Failure to comply will result in over-temperature or a fire. • Install the drive on the surface of an incombustible object and leave sufficient surrounding space for heat dissipation. • Take measures to prevent the servo drive from being frozen.
Environment humidity	Below 90% RH (no condensation)
Storage humidity	Below 90% RH (no condensation)
Vibration resistance	Operation: • 5 Hz–8.4 Hz: 3.5 mm displacement • 8.4 Hz–200 Hz: 1g Product package: • 5 Hz–100 Hz: $0.01g^2/Hz$ • 200 Hz: $0.001g^2/Hz$ • Grms = 1.14 g
Impact resistance	Below 19.6 m/s^2

Item	Requirement
IP rating	IP20 Note: excluding terminals (IP00)
Environment	Pollution Degree 2 and below Install the servo drive in a place that meets the following requirements: • Free from direct sunlight, dust, radioactive materials, combustible materials, corrosive gases, combustible and explosive gases, harmful gases and liquids, oil mist, water vapor, water drops, or salt • Not prone to vibration and away from equipment such as punch presses • Free from unwanted objects such as metal powder, oil, and water inside the servo drive • Away from combustible materials such as wood • Do not use it in the vacuum environment. It is recommended to use it in air pressure above 89.9 kPa (altitude 1000 m).

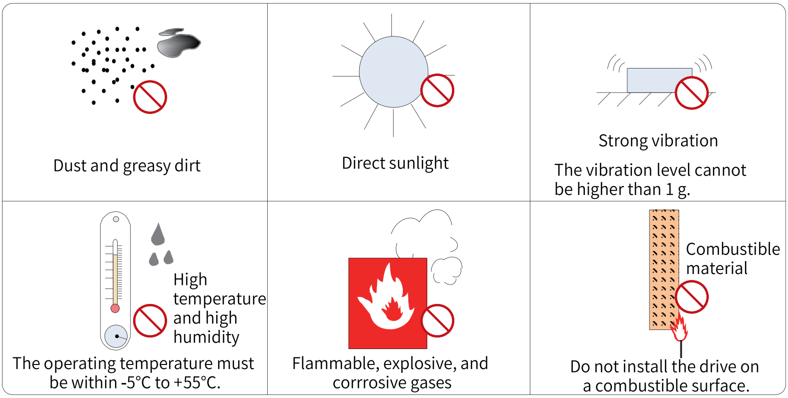


Figure 3-2 Environment requirements

3.3.2 Installation Clearance

Spaced installation

Servo drives in different specifications require different installation clearances. It is recommended to reserve a clearance of at least 10 mm (0.39 in.) between two drives, and a horizontal clearance of at least 20 mm (0.79 in.) and a vertical clearance of 80 mm (3.15 in.) between the drive and cabinet for heat dissipation.

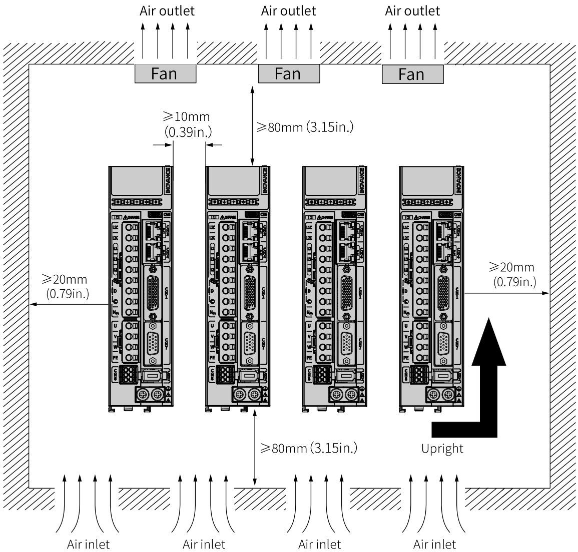


Figure 3-3 Clearance for side-by-side installation

Compact installation

Servo drives in size A support compact installation, in which a clearance of at least 1 mm (0.04 in.) must be reserved between every two drives. When adopting compact installation, derate the load to 75%.

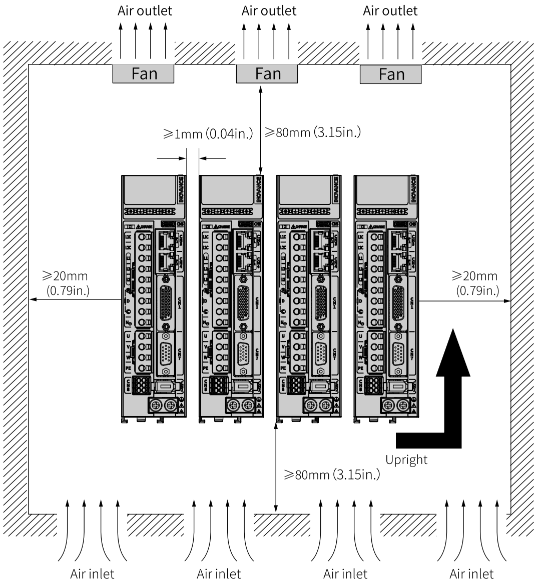


Figure 3-4 Clearance for compact installation

Zero-clearance installation

Servo drives in sizes C and D support zero-clearance installation without derating.

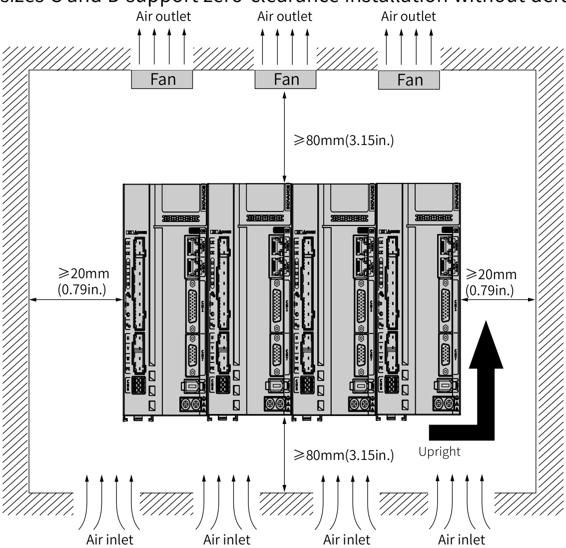


Figure 3-5 Zero-clearance installation

3.3.3 Installation Dimensions

Size A Drives (rated power: 0.2 kW to 0.4 kW)

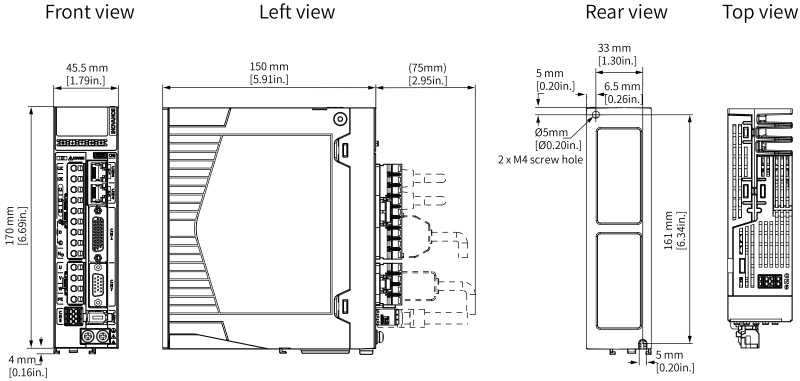


Figure 3-6 Dimensions of Size A

Fixing screw: 2 × M4; recommended tightening torque: 1.2 N·m

Mass: 0.96 kg

Size C drives (rated power: 0.75 kW to 1.5 kW)

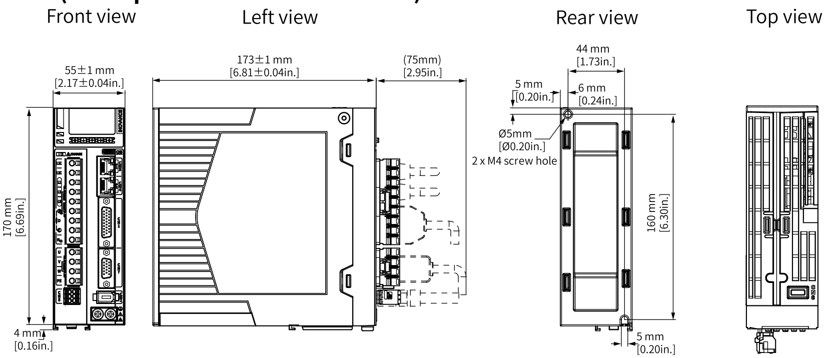


Figure 3-7 Dimensions of Size C

Fixing screw: 2 × M4; recommended tightening torque: 1.2 N·m

Mass: 1.3 kg

Size D drives (rated power: 1.5 kW to 3.0 kW)

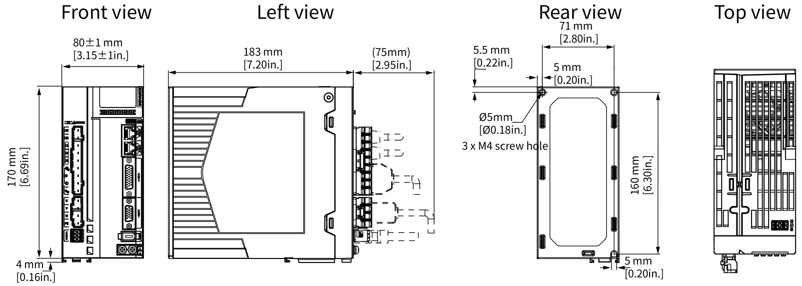


Figure 3-8 Dimensions of Size D

Fixing screw: 3 × M4; recommended tightening torque: 1.2 N·m

Mass: 1.8 kg

Size E Drives (rated power: 2.0 kW to 7.5 kW)

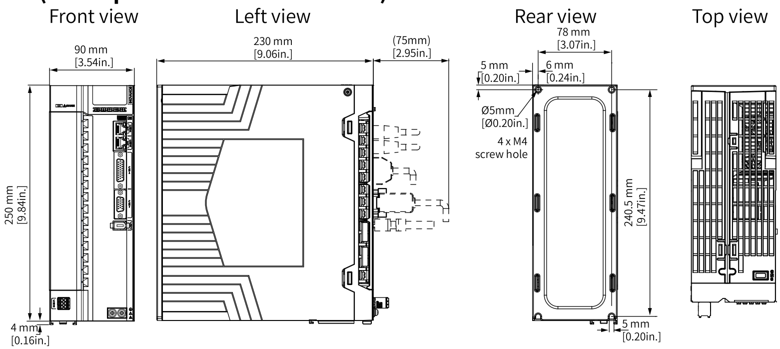


Figure 3-9 Dimensions of Size E

Fixing screw: 4 × M4; recommended tightening torque: 1.2 N·m

Mass: 3.6 kg

3.3.4 Pre-installation Check

Table 3–5 Pre-inspection checklist

No.	Item	Checked
1	The delivered product is consistent with your order.	☐
2	No deformation or cracks are present on the casing.	☐
3	All screws are in position and tightened.	☐
4	The signal terminal is free from fracture, foreign objects and bent pins.	☐

3.3.5 Mounting the Drive

Caution

- Note that the drive is energized with high voltage, and all wiring work must be carried out with the drive de-energized.
- Before maintenance, power off the drive, wait for 15 minutes and confirm that the voltage of the drive is lower than 36 VDC. Failure to comply can result in personal injury due to the residual voltage in the capacitor.
- Only trained persons are allowed to repair and maintain the drive. Failure to comply can result in major property loss, severe personal injury or even death.
- Due to the potential external power voltage, exert extreme caution when you are working on the device. Because the power supply and terminals may be live even if the motor does not run.
- Only trained persons are allowed to handle heavy equipment or equipment with high center of gravity. Improper lifting or handling may result in major property loss, serious personal injury or even death.

The servo drive supports backplate mounting only.

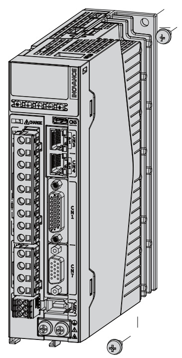


Figure 3-10 Backplate mounting

- Servo drives in sizes A and C are secured by two screws, with one screw on the top and the other one at the bottom.

- Servo drives in size D are secured by three screws, with two screws on the top and another one at the bottom.
- Size E is secured by four screws, with two screws on the top and the other two at the bottom.
- M4 screw, tightening torque: 1.2 N·m

Mounting the drive

1. Fix the drive with M4 screws, tightened to a recommended torque of 1.2 N · m. For details, see Section "Installation".
2. Perform wiring. Check the wiring according to the post-installation checklist. For wiring details, see Section "Terminals".
3. Turn on the power supply of the drive.
4. Perform a complete commissioning with the commissioning tool. For details, see Sections "Commissioning Tool" and "Commissioning and Operation".

Replacing the drive

1. Turn off the driver power supply.
2. Wait for 15 minutes, and check that the drive voltage is lower than 36 VDC.
3. Remove all cables on the drive.
4. Unscrew the two M4 screws and take off the drive.
5. Mount the drive. Fore details, see *" Mounting the drive" on page 73*.

3.3.6 Post-Inspection

Table 3–6 Inspection Checklist

No.	Description	Yes
1	Terminal screws are tightened to the specified torque and marked.	☐
2	The servo drive and the external braking resistor are placed on incombustible objects.	☐
3	There are no unwanted objects (such as cable terminals and metal chippings) that may cause short circuit of the signal cable and power cable inside or outside the servo drive.	☐
4	The servo motor is installed properly. The motor shaft is connected to the machine securely.	☐
5	The servo motor and the connected machine are in good condition and ready to run.	☐
6	The connector of the main circuit cable is crimped and installed firmly.	☐

3.4 Installation of Optional Parts

3.4.1 Instructions for Installing the Fuse and Circuit Breaker

Caution

To prevent electric shocks, when the fuse is blown or the circuit breaker trips, wait for at least the time designated on the warning label before powering on the drive or operating peripheral devices. Failure to comply will result in death, severe personal injury, or equipment damage.

3.4.2 Instructions for Installing the AC Input Reactor

The AC input reactor is an option used to suppress the harmonics in the input current. In applications where harmonics need to be suppressed, install an external AC input reactor.

The following figure shows the connection of the AC input reactor.

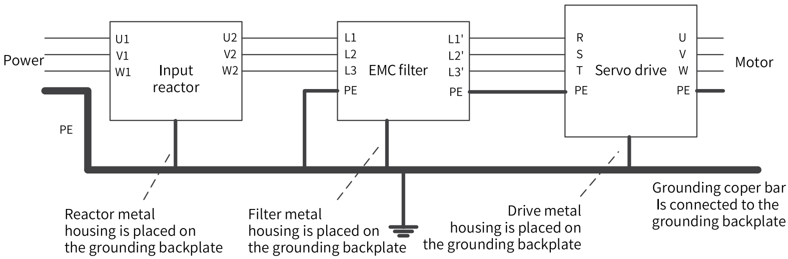


Figure 3-11 Connection of the AC input reactor

3.4.3 Instructions for Installing the EMC Filter

Note

- The connecting cable between the filter and the controller must be as short as possible (should be less than 30 cm).
- Ensure that the filter and controller are connected to the same grounding reference plane, and ensure that the filter is reliably grounded, otherwise the filtering effect of the filter cannot be achieved.

Use CE-compliant filters that comply with the emission requirements in Category C2 of EN 61800-3 and EN 12015. Properly ground the filter. Keep the cable connecting the filter to the controller shorter than 30 cm.

The following figure shows the connection of the EMC filter.

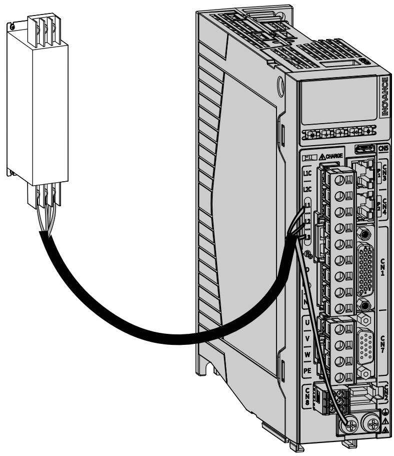


Figure 3-12 Connection of the EMC filter

3.4.4 Instructions for Installing the Magnetic Ring and Ferrite Clamp

The drive generates very strong interference during operation. The drive may interfere with or be interfered with by other devices due to improper routing or grounding. Wind the drive output U/V/W cable onto a magnetic ring for two to four turns. Wind the signal cable onto a ferrite clamp or magnetic ring for one to two turns.

- An amorphous magnetic ring has a high magnetic conductivity when the frequency is within 1 MHz and can efficiently suppress interference of the servo drive, but is expensive.
- A ferrite clamp has a high magnetic conductivity when the frequency is above 1 MHz and can efficiently suppress interference of various signal cables and low-power servo drives at a low cost.

The following figure shows the connection of the magnetic ring and ferrite clamp.

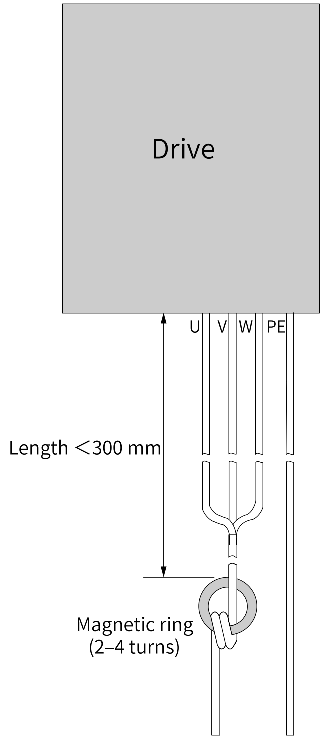


Figure 3-13 Installing the magnetic ring

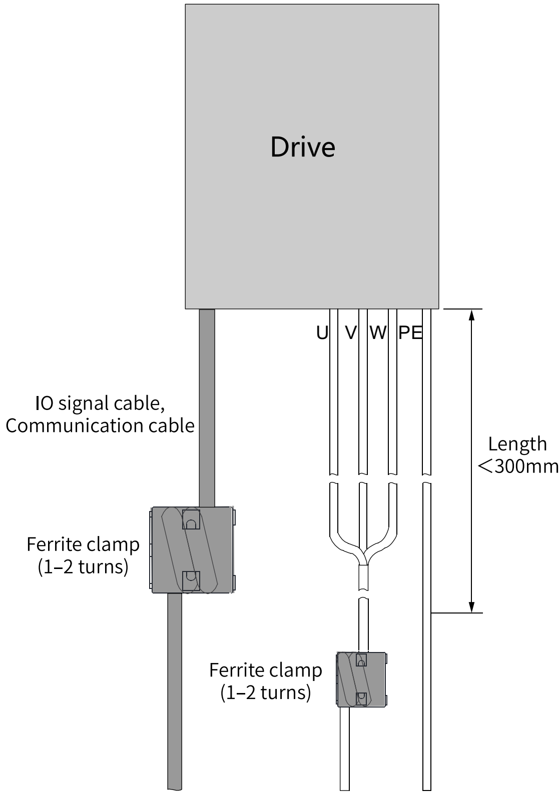


Figure 3-14 Installation of the ferrite clamp

3.4.5 Instructions for Installing the Shield Bracket

To reduce electromagnetic interference, an EMC bracket and clamp are used with the drive cables.

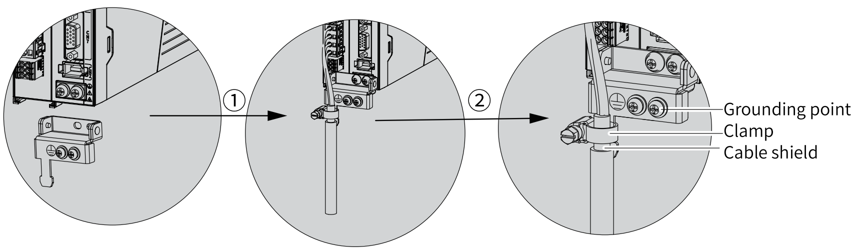


Figure 3-15 Installation of the shield bracket

- ①: Fix the shielding bracket to the drive with two M4 screws. The recommended tightening torque is 1.2 N·m.

- 2. Put the clamp on the cable shield and the shielding bracket and tighten the screw to fix the cable shield on the shielding bracket. Wire motor power cables and brake cables according to the wiring drawings.

3.4.6 Instructions for Installing the Absolute Encoder Battery Box

The optional S6-C4A battery box contains the following items:

- One plastic case.
- One battery (3.6 V, 2700 mAh).
- Terminal block and crimping terminal.

Installing the battery box

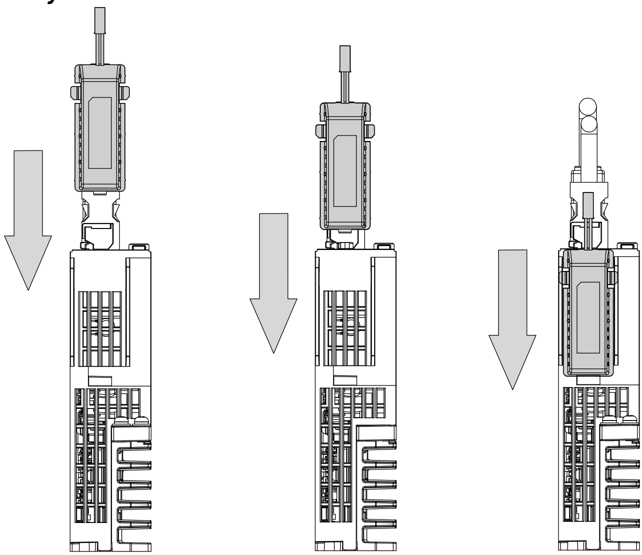
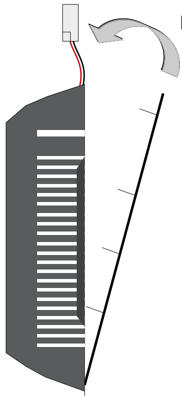


Figure 3-16 Installing the battery box (bottom view)

Removing the battery box

The battery may generate leakage liquid after long-term use. Replace it every two years. Remove the battery box in steps shown in the preceding figure, but in the reverse order.

When closing the battery box cover, prevent the connector cable from being pinched.



Improper use of the battery may result in liquid leakage which corrodes the components or leads to battery explosion. Observe the following precautions during use:

Caution

- Insert the battery with polarity (+/-) placed correctly.
- Leaving an idled or retired battery inside the device may lead to electrolyte leakage. The electrolyte inside the battery is highly corrosive, not only corroding surrounding components but also incurring the risk of short circuit. Replace the battery periodically (recommended interval: Every 2 years).
- Do not disassemble the battery because the internal electrolyte may spread out and result in personal injury.
- Do not throw the battery into the fire or heat up the battery. Failure to comply may result in an explosion.
- Do not short-circuit the battery or strip off the battery tube. Prevent terminals (+) and (-) of the battery from coming into contact with the metal. Contact with the metal will result in a large current, not only weakening the battery power, but also incurring the risk of explosion due to severe heating.
- This battery is not rechargeable.
- Dispose of the retired battery according to local regulations.

3.4.7 Connection of the network cable

Connecting the cable

1. The network port on the top is equipped with a dustproof plug. Remove it before inserting the cable connector.

2. When inserting the network cable, please insert the crystal head into the bottom of the network port, and the crystal head shrapnel will be stuck into the network port card slot to ensure the reliable connection of the network cable.

Removing the cable

Press the connector latch and pull out the network cable at the same time.

Caution

- It is forbidden to violently pull out the network cable; If the network cable is difficult to pull out, it is necessary to check whether the crystal head buckle is completely loose.
- It is recommended to use Inovance cable, specific model see *"6.4.2 Cable Requirements" on page 126*.

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4 system Connection

4.1 System Composition

- The servo drive is directly connected to an industrial power supply, with no isolation such as a transformer. A fuse or circuit breaker therefore must be connected to the input power supply to prevent electric shock in the servo system. For the sake of safety, install a residual current device (RCD) to provide protections against overload and short circuit or a specialized RCD to protect the grounding cable.
- Do not start or stop the motor by using the electromagnetic contactor. As a high-inductance device, the motor may generate transient high voltage that may break down the contactor.
- When connecting an external power supply to the control circuit or a 24 VDC power supply, pay attention to the power capacity as insufficient power capacity will lead to insufficient supply current, resulting in failure of the servo drive or the brake. This is especially true when the power supply is used to power up multiple servo drives or brakes. The brake must be powered up by a 24 VDC power supply that matches the motor model and meets the brake power requirements.

4.2 System Wiring Diagram

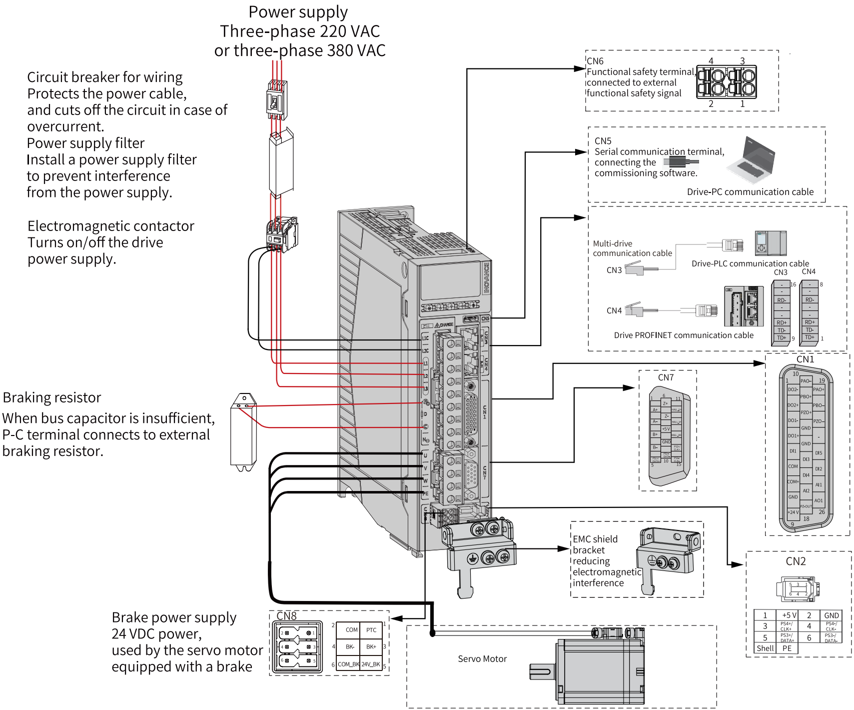


Figure 4-1 System wiring example

Note

- CN2 is used as the encoder terminal when an Inovance rotary servo motor is connected. CN7 is used when a purchased motor is connected.
- When you need to use an external braking resistor, first remove the jumper between terminals P ⊕ and D and connect it between P ⊕ and C. If you do not need the resistor, keep the jumper as is. Note that only size A does not come standard with a built-in resistor and PD jumper. Before use the resistor, ensure that you have set H02.25，H02.26 and H02.27 correctly.

4.3 Common DC Bus

Up to 6 drives can connect to the common DC bus. With the common DC bus, the energy fed back by the drive working in the regenerative mode can be used by the drive working in the drive mode, rather than being consumed on the braking resistor. That improves the system efficiency.

The topology of the common DC bus is as follows.

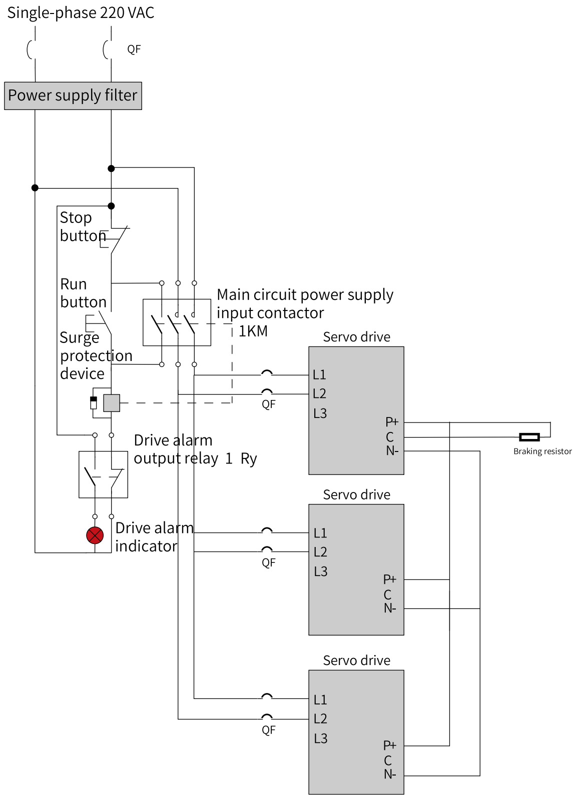


Figure 4-2 Topology of single-phase 220 VAC input common DC bus

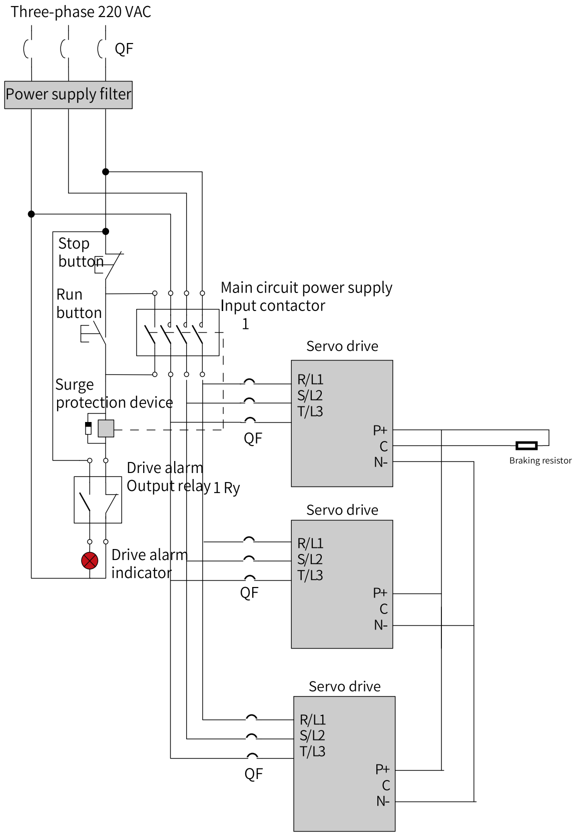


Figure 4-3 Topology of three-phase 220 VAC/380 VAC input common DC bus

Model requirements

Note

- Drives with the same or adjacent power can connect to the same common DC bus. Only two models are allowed in the same common DC bus system.For example, if one is an SV680FS5R5I-GINT drive, then the other can be an SV680FS2R8I-GINT or SV680FS7R6I-GINT drive.
- The voltage classes of drives on the common DC bus must be the same. A single-phase 220 V drive cannot coexist with a three-phase 220 V drive.For example, an SV680FS5R5I-GINT and an SV680FS7R6I-GINT powered by single-phase 220 V can connect to the same common DC bus. However, an SV680FS5R5I-GINT powered by single-phase 220 V and an SV680FS7R6I-GINT powered by three-phase 220 V cannot connect to the same common DC bus.

Wrong example:

- Wrong common bus connection of a single-phase 220 V model and a three-phase 380 V model

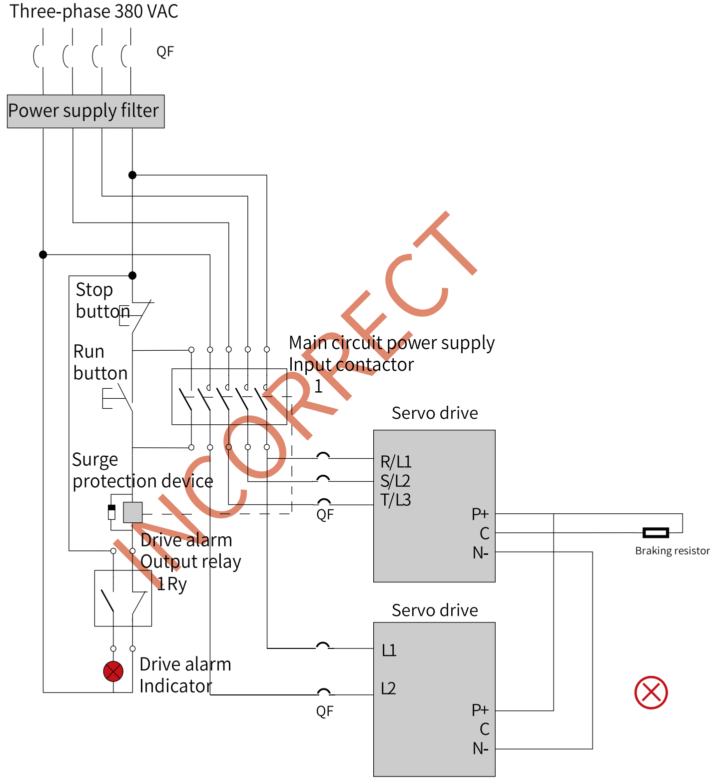


Figure 4-4 Wrong common bus connection of a single-phase 220 V model and a three-phase 380 V model

- Wrong common bus connection of a single-phase 220 V model and a three-phase 220 V model

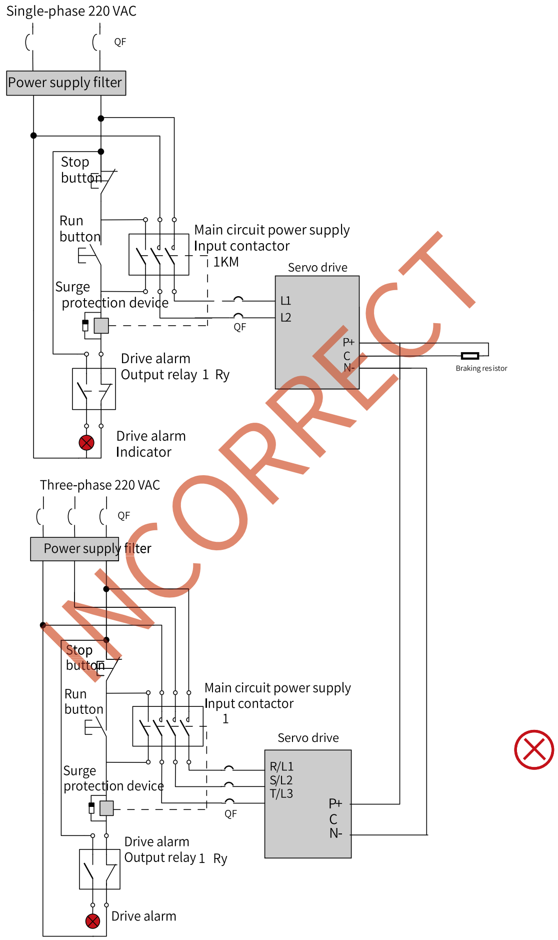


Figure 4-5 Wrong common bus connection of a single-phase 220 V model and a three-phase 220 V model

Requirements on circuit breakers and contactors

For details, see contents related to circuit breaker selection in Section "Peripheral Components".

Installation requirements

- It is recommended to arrange the servo drives on the common DC bus in the order of power from large to small (viewed from the direction of AC power incoming line).
- It is recommended to mount the servo drives on the common DC bus in the same control cabinet.

Wiring requirements

Caution

- You must connect an AC power supply to the AC input terminal of each drive, and all AC power supplies must come from the same transformer.
- In a common DC bus system, do not use different phases of the transformer for the single-phase AC power supplies of different drives .For example, the AC transformer output terminals are R/S/T/N. If drive A uses a single-phase power supply and the input terminals are connected to R and N, then the AC input terminals of other drives on the common DC bus must also connect to R and N.
- Do not connect a DC power supply to the DC bus terminal.
- When the braking resistor is used, it is recommended to connect it to the drive with the largest power. If a single braking resistor cannot meet the requirements of frequent braking, connect a braking resistor to each drive. For the evaluation method, see Section "Option-Braking Resistor" in the *selection guide*.

Wrong example:

- Wrong common DC bus connection of two drives with different AC input sources

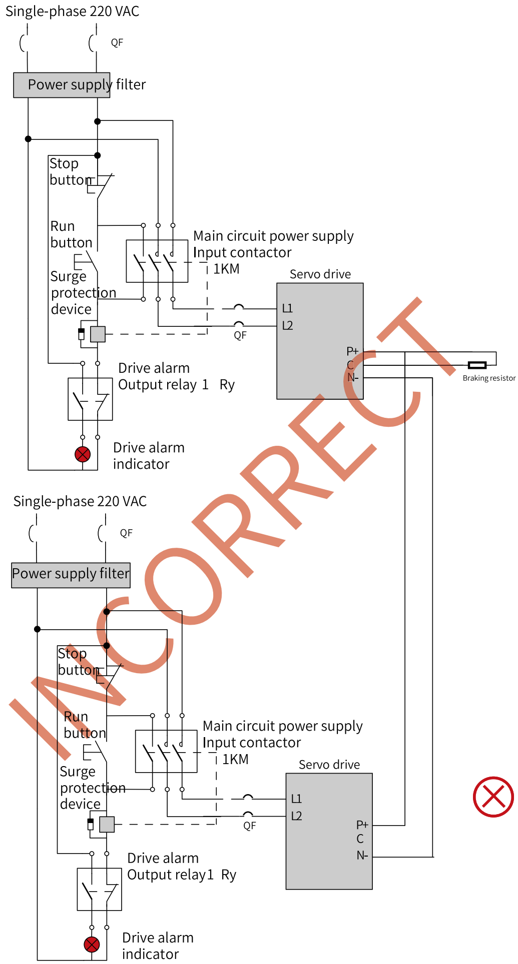


Figure 4-6 Wrong common DC bus connection of two drives with different AC input sources

- Wrong common DC bus connection of two drives using R/N and S/N AC inputs respectively

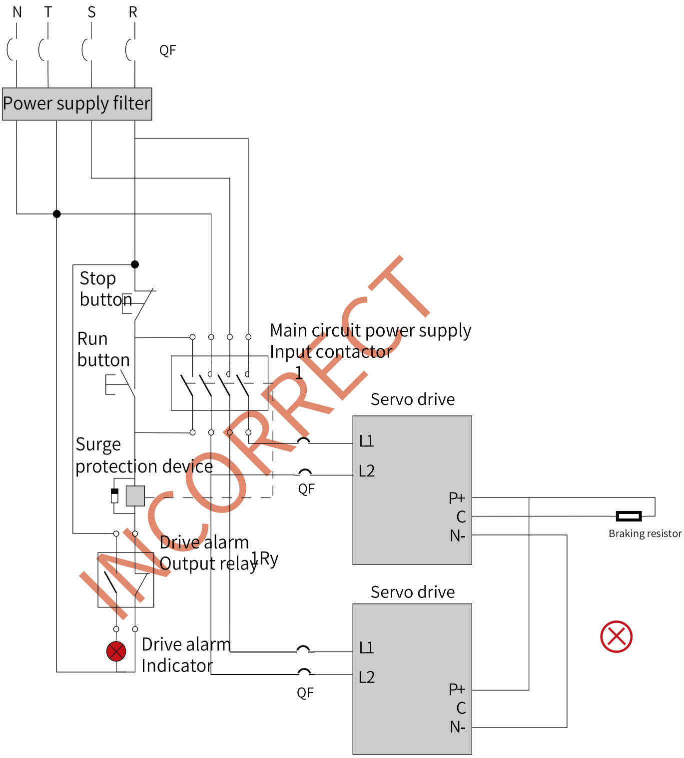


Figure 4-7 Wrong common DC bus connection of two drives using R/N and S/N AC inputs respectively

Cable requirements

- The wiring length between common DC bus terminals should be as short as possible. The length of cables should be kept as consistent as possible. The length of the common bus cable between two drives must not exceed 0.5 meters.
- The diameter of the DC side cable cannot be smaller than that of the motor power line and the AC side input cable. For the evaluation method, see Section "Selection of cables" in the selection guide.

Operation requirements

- Drives on the common bus system must be powered on and off at the same time.
- Drives on the common bus system must be in the run state at the same time. Failure to comply will affect the service life of the drives.
- Drive braking is subject to current carrying limiting. The following table lists the limits. According to actual conditions, if the average current exceeds the current carrying limit, you must connect a braking resistor to each servo drive. According to the selection

instructions of the braking resistor, the current flows through the braking resistor I_{break} is:

$$I_{break} = \frac{E_1 - E_c}{T \times U_{uv}}$$

Item	S1R6	S2R8	S5R5	S7R6	S012	S018	S022	S027	T3R5	T5R4	T8R4	T012	T017	T021	T026
Brake current carrying limit (A)	3	3	7	7	7	14	14	14	7	7	7	7	14	14	14

E_l is the braking energy, in J. E_c is the energy absorbed by the capacitor, in J. U_{UV} is the drive discharge threshold voltage, in V. T is the reciprocating period, in s.

5 Electrical Wiring Diagram

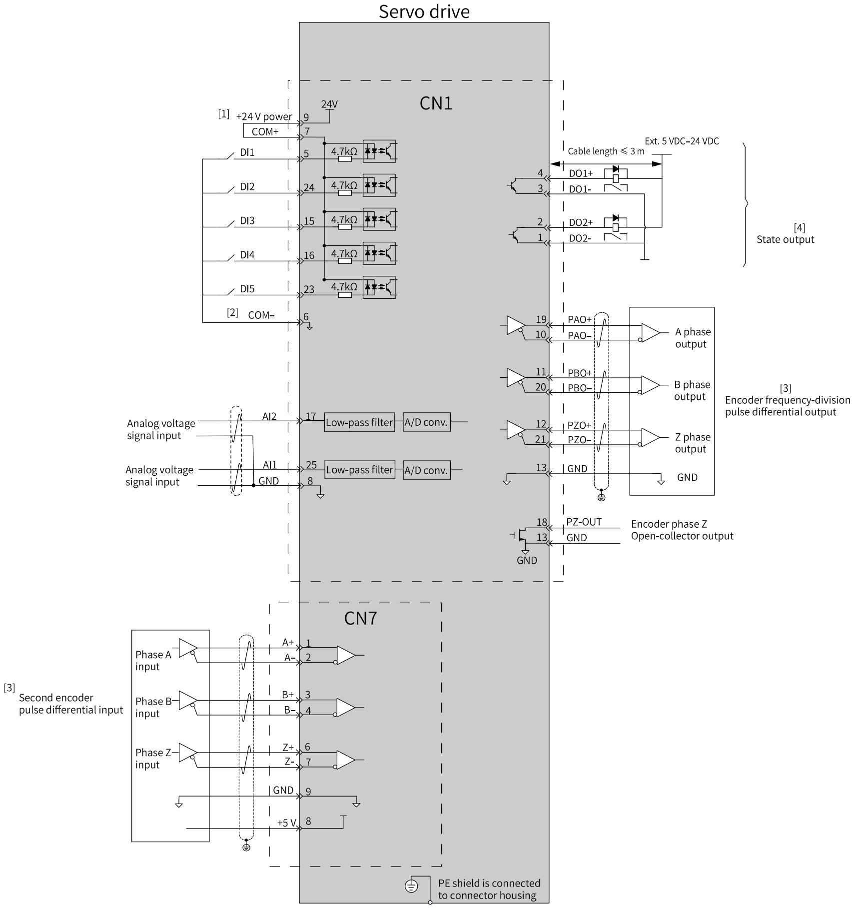


Figure 5-1 Electrical Wiring Diagram

Note

- indicates shielded twisted pairs.
- [1] The range of the internal +24 V power supply is 20 V to 30 V, with maximum operating current being 150 mA (@25°C).
- [2] DI4 and DI5 are high-speed DIs that must be used according to their functions assigned. DI allows external power supplies. See *" DI circuit" on page 110* for details.
- [3] Use shielded twisted pairs as frequency-division output cables and full closed-loop input cables, with both ends of the cable shield connected to PE. Connect GND to the signal ground of the host controller properly.
- [4] The DO power supply (voltage range: 5 V to 24 V) needs to be prepared by users. The DO terminals support 30 VDC voltage and 50 mA current to the maximum. You can enable optocoupler input on the affiliated device through an additional current limiting resistor. For details, see *" DO circuit" on page 111*.

6 Wiring Terminals

6.1 Main Circuit Terminals

6.1.1 Terminal Pin Arrangement

Servo drives in sizes A, C and D (rated power: 0.2 kW to 3.0 kW)

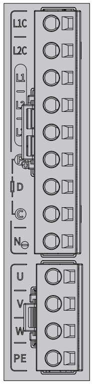


Figure 6-1 Main circuit terminals

Table 6–1 Description of main circuit terminals

Name	Description
L1C, L2C (control circuit power input terminals)	See the nameplate for the rated voltage class.
L1, L2, L3 (main circuit power input terminals)[1]	Power input terminals of the servo drive. See the nameplate for the rated voltage class.
P ⊕ , D, and C (terminals for connecting an external braking resistor)[2]	Remove the jumper bar between terminals P⊕ and C before connecting an external braking resistor between terminals P ⊕ and D.
P ⊕ , N ⊖ (servo bus terminals)	Used by the common DC bus for multiple servo drives.
U, V, W and PE (terminals for connecting the servo motor)	Connected to U, V, and W phases and the grounding terminal of the servo motor.

Note

- [1]: The power input terminals of the 200V servo drive's main circuit are L1, L2, and L3, you can use any two of which for single-phase input; and the power input terminals of the 400V servo drive's main circuit are R, S, and T.
- [2] The built-in braking resistor or jumper bar is not available in models S1R6 and S2R8. If an external braking resistor is needed for these models, connect it between terminals P ⊕ and C.

Servo drives in size E (rated power: 2.0 kW to 7.5 kW)

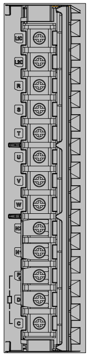


Figure 6-2 Main circuit terminals

Table 6–2 Description of main circuit terminals

Name	Description
L1C, L2C (control circuit power input terminals)	See the nameplate for the rated voltage class.
R, S, and T (main circuit power input terminals)[1]	Power input terminals of the servo drive. See the nameplate for the rated voltage class.
P ⊕ , D, C (terminals for connecting external braking resistor)	Remove the jumper bar between terminals P⊕ and C before connecting an external braking resistor between terminals P ⊕ and D.
N2, N1 (terminals for connecting external reactor)	Terminals N1 and N2 are jumpered by default. To suppress harmonics in the power supply, remove the jumper between terminals N1 and N2 first and connect an external DC reactor between terminals N1 and N2.
U, V, W (terminals for connecting the servo motor)	Connected to U, V, and W phases of the servo motor.

Note

[1]: The power input terminals of the 200V servo drive's main circuit are L1, L2, and L3, you can use any two of which for single-phase input; and the power input terminals of the 400V servo drive's main circuit are R, S, and T.

6.1.2 Wiring Precautions and Requirements

Danger

- Do not connect the output terminals U, V, and W of the drive to a three-phase power supply. Failure to comply may result in physical injury or a fire.
- Do not connect the motor terminals U, V, and W to a mains power supply. Failure to comply may result in physical injury or a fire.
- The main circuit cable must be away from the motor so that its insulation will not be damaged by high temperature of the motor surface.
- Connect the servo drive to the motor directly. Do not use an electromagnetic contactor during wiring. Failure to comply may result in equipment fault.

Caution

- Do not use the power from IT system for the drive. Use the power from TN/TT system for the drive. Failure to comply may result in an electric shock.
- Connect a electromagnetic contactor between the input power supply and the main circuit power supply of the servo drive (R, S and T) to form a structure which allows independent power cutoff on the servo drive power side. This is to prevent fire accident caused by continuous high current generated upon fault.
- Check that the input power supply of the drive is within the specified voltage range. Failure to comply may result in faults.
- The main circuit cable must be away from the motor so that its insulation will not be damaged by high temperature of the motor surface.
- Use the ALM (fault) signal to cut off the main circuit power supply. A faulty braking transistor may overheat the regenerative resistor and lead to a fire.
- Connect the PE terminal of the drive to the PE terminal of the control cabinet. Failure to comply may result in an electric shock.
- Ground the entire system properly. Failure to comply may result in equipment malfunction.
- After the power supply is cut off, residual voltage is still present in the internal capacitor of the drive, wait for at least 15 min before further operations. Failure to comply may result in an electric shock.
- The specifications and installation method of external cables must comply with the applicable local regulations.
- Observe the following requirements when the servo drive is used on a vertical axis.
  - Set the safety device properly to prevent the workpiece from falling upon warning or overtravel.
  - Ensure the positive/negative polarity of the 24 V power supply is correct. Otherwise, the axis may fall and cause personal injury or equipment damage.
- It is recommended to use Teflon cables featuring a higher temperature limit when the temperature inside the cabinet exceeds the temperature limit of regular cables. As the surface of regular cables may be easily hardened and cracked under low temperature, take thermal insulation measures for cables laid in environments with low temperature.
- The servo drive must be grounded properly. Failure to comply may result in device malfunction or damage.

Caution

- Observe the following requirements during wiring of the power supply and main circuit:
  - When the main circuit terminal is a connector, remove the connector from the servo drive before wiring.
  - Insert one cable into one cable terminal of the connector. Do not insert multiple cables into one cable terminal.
  - When inserting cables, take enough care to prevent the cable conductor burrs from being short circuited to the neighboring cable.
  - Insulate the connecting part of the power supply terminals to prevent electric shock.
  - Do not connect a 220 V servo drive to a 380 V power supply directly.
  - Install safety devices such as a circuit breaker to prevent short circuit in external circuits. Failure to comply may result in a fire.
  - Cut off the main circuit power supply and switch off the S-ON signal after an alarm signal is detected.
  - After all cables are connected, it is recommended to tie them at the point 10cm–20cm away from the connector end.
- Do not put heavy objects onto cables or pull cables with excessive force. Failure to comply may result in cable damage, leading to an electric shock.
- Use a power supply filter to reduce the electromagnetic interference on electronic devices surrounding the servo drive.

Caution

- Ensure that the shielded cable is securely connected to the drive grounding terminal. Ensure that the cables are properly and securely installed. Failure to comply will result in motor malfunction or damage.
- Fasten the screws on the power side. Failure to comply will result in a fire. Use the motor within the rated voltage range. Failure to comply will result in a fire.
- Reduce the routing length and cable length as possible. For cable diameters, see the instructions in this manual about the precautions for wiring the signal cable. Keep the power cable away from the signal cable at least 100 mm. Interference on the signal cables will cause vibration or malfunction.
- Cables of the standard specifications are recommended. If cables of other specifications need to be used, select the cables properly based on the rated current of the equipment and the running environment. The cables of other specifications must be twisted-pair or multi-core twisted pair.
- Do not connect the commercial-use power directly to the motor. Risk of fire or malfunction.

6.1.3 Wiring Examples

6.1.3.1 Wiring of the Power Supply

Single-phase 200V Models

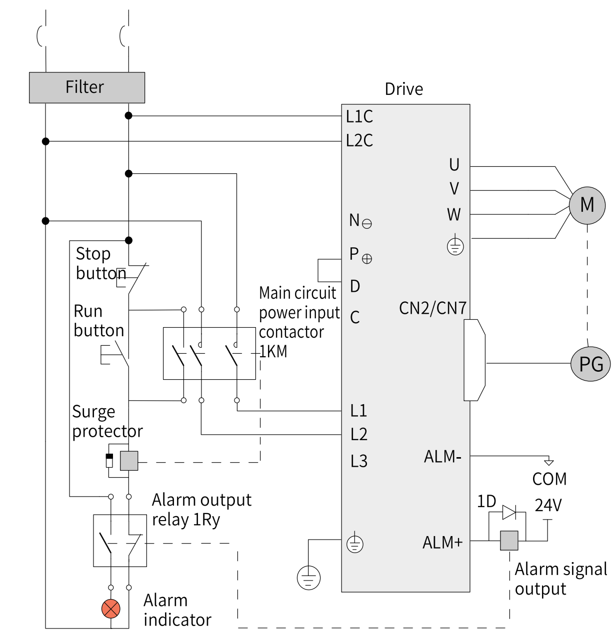


Figure 6-3 Main circuit wiring of single-phase 200 V models

Note

- 1KM: Electromagnetic contactor; 1Ry: Relay; 1D: Flywheel diode
- DO is set as alarm output (ALM+/-). When the servo drive alarms, the power supply will be cut off automatically. S1R6 and S2R8 are not configured with built-in braking resistors, if the braking resistor is needed, remove the shorting cable between P⊕ and C and connect an external braking resistor there.
- CN2 is used as the encoder terminal when a rotary servo motor is connected. CN7 is used when a purchased motor is connected.

Three-phase 200V Models

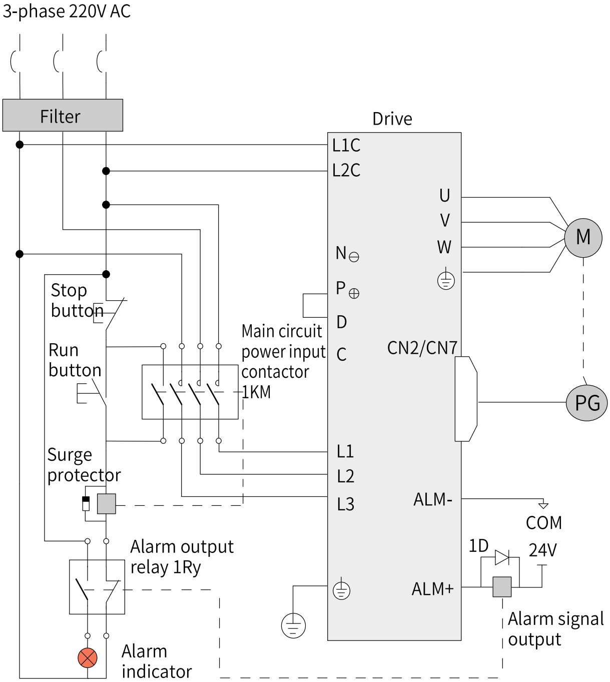


Figure 6-4 Main circuit wiring

Note

- 1KM: Electromagnetic contactor; 1Ry: Relay; 1D: Flywheel diode
- The DO is set as alarm output (ALM+/-). When the servo drive alarms, the power supply is cut off automatically and the alarm indicator lights up.
- CN2 is used as the encoder terminal when a rotary servo motor is connected. CN7 is used when a purchased motor is connected.

Three-phase 400V Models

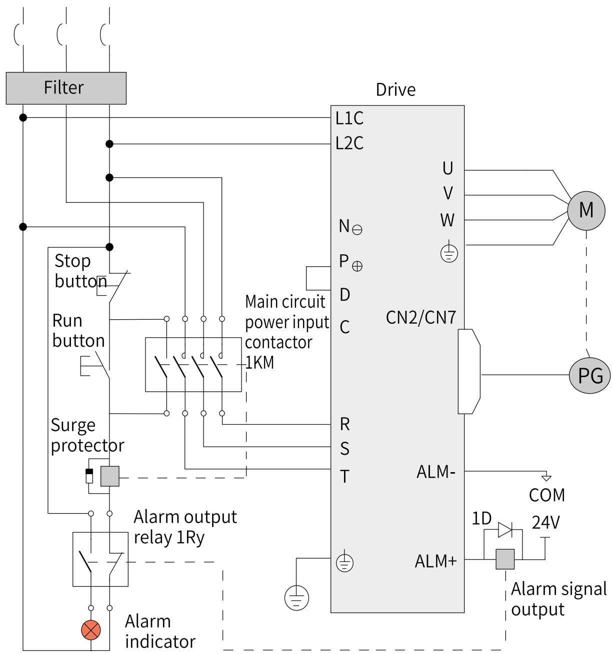


Figure 6-5 Main circuit wiring

Note

- 1KM: Electromagnetic contactor; 1Ry: Relay; 1D: Flywheel diode
- The DO is set as alarm output (ALM+/-). When the servo drive alarms, the power supply is cut off automatically and the alarm indicator lights up.
- CN2 is used as the encoder terminal when a rotary servo motor is connected. CN7 is used when a purchased motor is connected.

6.1.3.2 Wiring of the Grounding Cable

Observe the following requirements to ensure a proper grounding of the servo drive.

Warning

- To prevent electric shocks, ground the grounding terminal properly. Observe related national or regional regulations during grounding.
- To prevent electric shocks, ensure the protective grounding conductor complies with technical specifications and local safety standards. Keep the length of the grounding cable as short as possible. As the leakage current of a single drive does not exceed AC 3.5 mA or DC 10 mA, the grounding cable of the drive must be has the same conductor cross-sectional area as the phase cable. On the other hand, the leakage current of multiple drives connected in parallel may exceed 3.5 mA, therefore, it is recommended to use a copper protective grounding conductor with a cross-sectional area of at least 10 mm^2, or use two protective grounding conductors with the same specification. The cross-sectional area of the grounding cable (except the motor grounding cable) must not be smaller than 2.5 mm^2.
- The dimensions of the grounding cable must comply with the electrical device technical standards. Keep the length of the grounding cable as short as possible. Failure to comply will lead to unstable potential in the grounding terminals away from the grounding point due to leakage current, resulting in an electric shock.

说明

- For use of multiple servo drives, observe all the grounding instructions for the drive. Improper grounding of the device will lead to malfunction of the drive and the device.
- Do not share the same grounding cable with other devices (such as welding machines or high-current electrical devices). Improper grounding of the device will lead to drive or device faults caused by electrical interference.

Grounding requirements

Observe the following requirements to ensure a proper grounding of the drive.

- The protective grounding conductor must be a yellow/green cable comprised of copper conductors. Do not connect the protective grounding conductor to a switching device (such as a circuit breaker) in serial.
- Ground the grounding terminal properly. Improper grounding will lead to device malfunction or damage.
- Do not connect the grounding terminal to the N terminal of the neutral wire of the power supply.
- It is recommended to install the drive on a conductive metal surface. Ensure the whole conductive bottom of the drive is connected properly to the mounting face.
- Tighten the grounding screw with specified tightening torque to prevent the protective grounding conductor from being secured improperly.

Multi-drive grounding

Side-by-side installation of multiple drives:

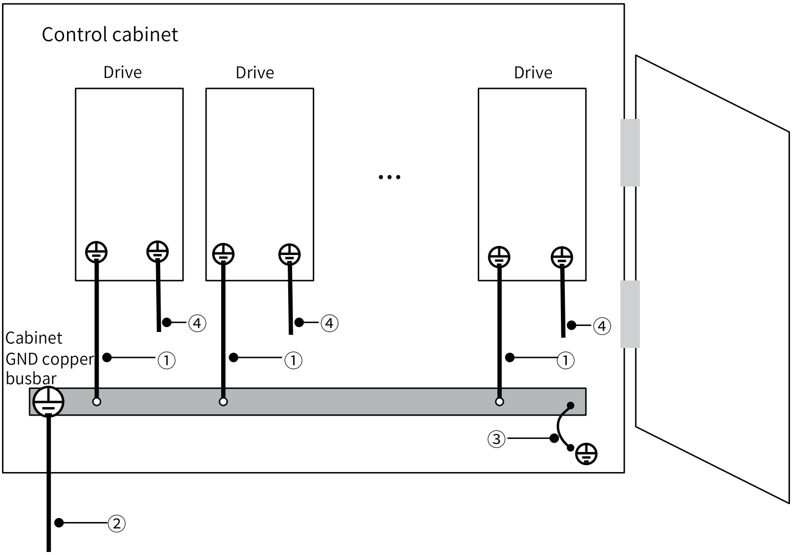


Table 6–3 Description for grounding of multiple drives installed in parallel

No.	Wiring
1	Connect the main circuit input PE terminal of the drive to the grounding copper busbar of the control cabinet through a protective grounding conductor.
2	Connect the PE cable on the input power supply side to the grounding copper busbar of the control cabinet.
3	Connect the grounding copper busbar of the control cabinet to the metal enclosure of the control cabinet through the protective grounding conductor.
4	Connect the motor output cable shield to the output PE terminal of the servo drive.

Grounding the control cabinet system

The most cost-effective method of suppressing interference in a control cabinet is to isolate the interference source from devices that may be interfered with. Divide the control cabinet into multiple EMC compartments or use multiple control cabinets based on the intensity of interference sources, and install each device in accordance with the following wiring principles.

Table 6–4 Wiring requirements

No.	Wiring requirements
1	Place the control unit and the drive unit in two separate control cabinets.
2	If multiple control cabinets are used, connect the control cabinets by using a PE cable with a cross-sectional area of at least 16 mm^2 for equipotentiality between the control cabinets.
3	If only one control cabinet is used, place different devices in different compartments of the control cabinet based on signal intensity.
4	Apply equipotential bonding to devices in different compartments inside the control cabinet.
5	Shield all communication (such as RS485) and signal cables drawn from the control cabinet.
6	Place the power input filter in a position near the input interface of the control cabinet.
7	Apply spray coating to each grounding point in the control cabinet.

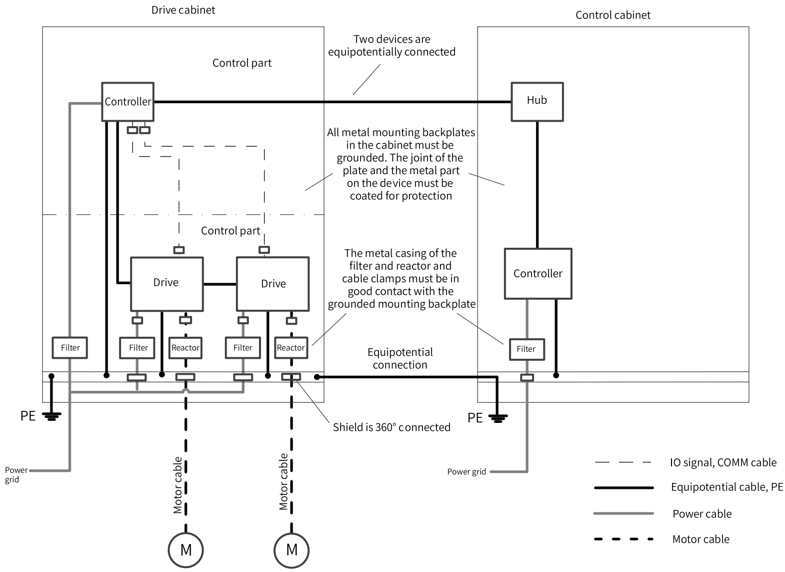


Figure 6-6 Recommended wiring for the control cabinet system

6.1.4 Cable Requirements

Cable Model

- The bending radius of a cable must be above 10 times its outer diameter to prevent the internal conductor from breaking due to long-time bending.

- Use cables with a rated voltage above 600 VAC and rated temperature above 75°C. Under an ambient temperature of 30°C and normal cooling conditions, the permissible current density of the cable cannot exceed 8 A/mm2 when the total current is below 50 A, or 5 A/mm2 when the total current is above 50 A. The permissible current density (A/ mm^2) can be adjusted based on the following formula in case of high ambient temperature or bundled cables.
  Allowable current density = 8 x Reduction coefficient of current-carrying density of the conductor x Current correction coefficient
  Current correction coefficient $= \sqrt{\text{(Cable max. allowable temperature - Ambient temperature) / 30}}$

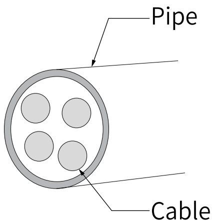


Table 6–5 Reduction coefficient of conductor current-carrying density

Number of Cables in a Duct	Current Reduction Coefficient
＜3	0.7
4	0.63
5–6	0.56
7–15	0.49

- It is recommended to route power cables and signal cables separately. To avoid EMC interference, the distance between them must be at least 30 cm.

Cable selection

To comply with the EMC standards, use shielded cables. You can use shield-less cables if EMC is not a concern.

The shielded cable must be four-core, with one core being the PE wire. See the following figure.

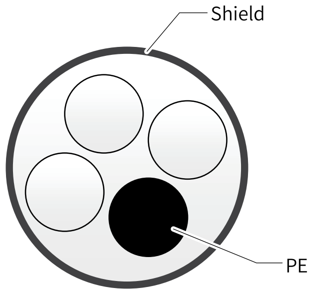


Figure 6-7 Four-core shielded cable

The shield of the shielded cable is comprised of cooper braids to suppress radio frequency interference. To enhance the shielding performance and conductivity, the braided density of the shield must be greater than or equal to 85%.

Observe national or regional regulations when selecting cable dimensions. The IEC cable must meet the following requirements:

- EN 60204-1 and IEC 60364-5-52 standards
- Use PVC insulated cables with copper conductors.
- Heat resistance: 40°C ambient temperature and 70°C cable surface temperature

Note

If the recommended cable specifications for peripheral devices or optional parts exceed the applicable cable specification range, contact Inovance.

Cable Specifications

Table 6–6 Input/Output current specifications of the servo drive

Servo Drive Model		Rated input current (A)	Rated output current (A)	Maximum Output Current (A)
Single-phase 200 V				
Size A	S1R6	2.3	1.6	5.8
	S2R8	4.0	2.8	10.1
Size C	S5R5	7.9	5.5	16.9
	S7R6	9.6	7.6	23.0
Size D	S012	12.8	12.0	32.0
Three-phase 200 V				
Size A	S1R6	1.1	1.6	5.8
	S2R8	2.3	2.8	10.1
Size C	S5R5	4.4	5.5	16.9
	S7R6	5.1	7.6	23.0
Size D	S012	8.0	12.0	32.0

Servo Drive Model		Rated input current (A)	Rated output current (A)	Maximum Output Current (A)
Size E	S018	8.7	18.0	45.0
	S022	11.0	22.0	55.0
	S027	23.8	27.0	67.5
Three-phase 400 V				
Size C	T3R5	2.4	3.5	11.0
	T5R4	3.6	5.4	14.0
Size D	T8R4	5.6	8.4	20.0
	T012	8.0	12.0	30.0
Size E	T017	12.0	17.0	42.5
	T021	16.0	21.0	52.5
	T026	21.0	26.0	65.0

Recommended main circuit cables

- For CE, see *"9.1.3 Cable Specifications (CE)" on page 512*.
- For UL, see *"9.2.1 Cable Specifications (UL)" on page 518*.

6.2 Description of Control Terminal (CN1)

6.2.1 Terminal Pin Arrangement

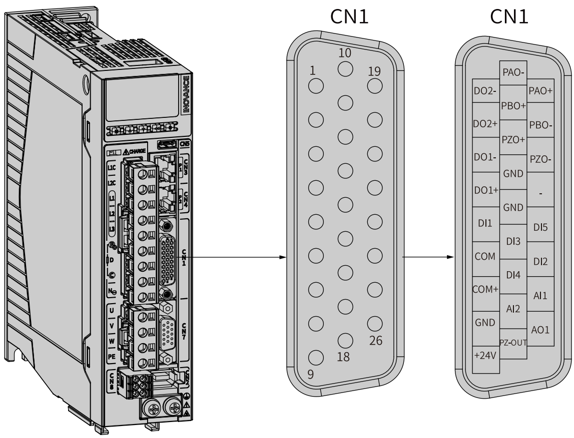


Figure 6-8 Control terminal pin layout (CN1)

Note

Use shielded cables as signal cables, with both ends of the shielded cable grounded.

Table 6–7 Description of DI/DO signals

Signal Name		Default Function	Pin No.	Function
General	DI1	P-OT	5	Positive limit switch
	DI2	N-OT	24	Negative limit switch
	DI3	HomeSwitch	15	Home switch
	DI4	Emergence Stop	16	Emergency stop
	DI5	TouchProbe1	23	Touch probe 1
	+24 V		9	Internal 24 V power supply; voltage range: 20V to 30V; maximum output current: 150 mA (@25°C)
	COM–		6	
	COM+		7	Common terminal of DI terminals
	DO1+	S-RDY+	4	Ready to switch on
	DO1-	S-RDY-	3	
	DO2+	ALM+	2	Fault
	DO2-	ALM+	1	

Table 6–8 Encoder frequency-division output signals

Signal Name		Pin No.	Function	
General	PAO+	19	Phase A frequency-division output signal	Quadrature frequency-division pulse output signals of phases A and B
	PAO–	10		
	PBO+	11	Phase B frequency-division output signal	
	PBO–	20		
	PZO+	12	Phase Z frequency-division output signal	Home pulse output signal
	PZO–	21		
	PZ-OUT	18	Home pulse open-collector output signal	
	GND	13	Home pulse open-collector output signal ground	
	PE	Housing	-	

Table 6–9 Specifications of AI/AO signals

Signal Name		Pin No.	Function
General	AO1	26	Analog Output Voltage range: –10 V to +10 V
	GND	8	Common terminal of AI/AO
	AI1	25	Voltage-type AI 1, 16-bit Voltage range: –10 V to +10 V Maximum allowable voltage: ±12 V
	AI2	17	Voltage-type AI 2, 12-bit Voltage range: –10 V to +10 V Maximum allowable voltage: ±12 V
	PE	Housing	-

Note

- When analog input is used as a reference, even after zero drift calibration, the internal circuit of the servo drive cannot provide an absolutely correct 0 value due to the ambient temperature.
- In this case, complete stop must depend on disabling or emergency stop, rather than 0 analog input.
- If reference control is not a concern, you can increase the dead zone (H03.53). If it is impossible, use a high-precision channel.

6.2.2 Wiring Precautions and Requirements

I/O signals include DI/DO signals and relay output signals.

Observe the following requirement during control circuit wiring:

Caution

- When connecting DO terminals to relays, ensure the polarity of the flywheel diode is correct. Wrong polarity will result in equipment damage or signal output failure.
- Keep a distance of at least 30 cm between main circuit cables (RST and UVW) and I/O signal cables/encoder cables. Otherwise equipment may malfunction due to disturbed I/O signals.
- Use twisted pairs or multi-conductor shielded twisted pairs as the I/O signal cable or encoder cable. Failure to comply may result in equipment malfunction.

6.2.3 Wiring Examples

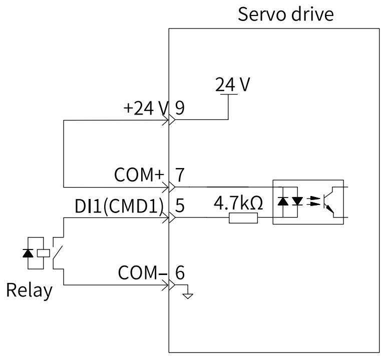
6.2.3.1 DI/DO Signals

DI circuit

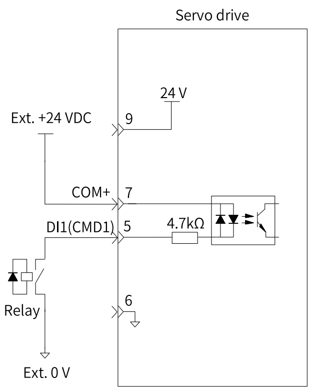
The DI circuits of the drive are the same. The following takes the DI1 circuit as an example.

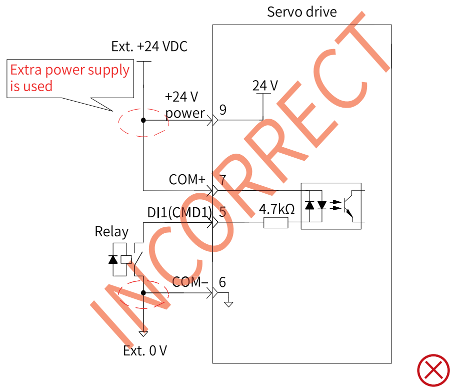
For DI terminal arrangement, see *"Table 6–7 Description of DI/DO signals" on page 108*.

- The host controller provides relay output:
  - When you use the internal 24 V power supply:

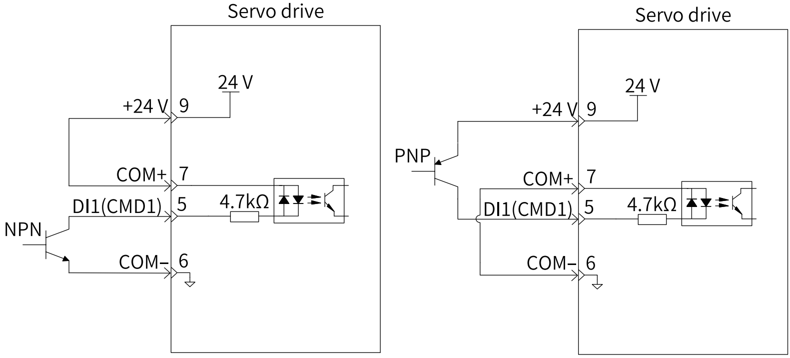


  - When you use an external power supply:

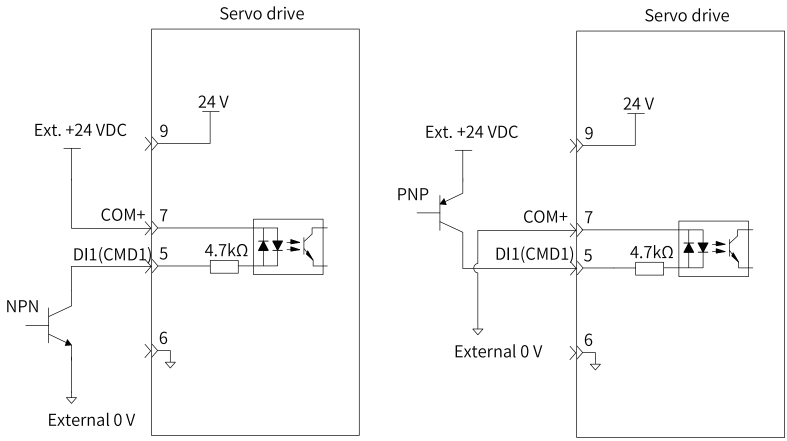




- The host controller provides open-collector output.
  - When you use the internal 24 V power supply:



■ When you use an external power supply:



Note

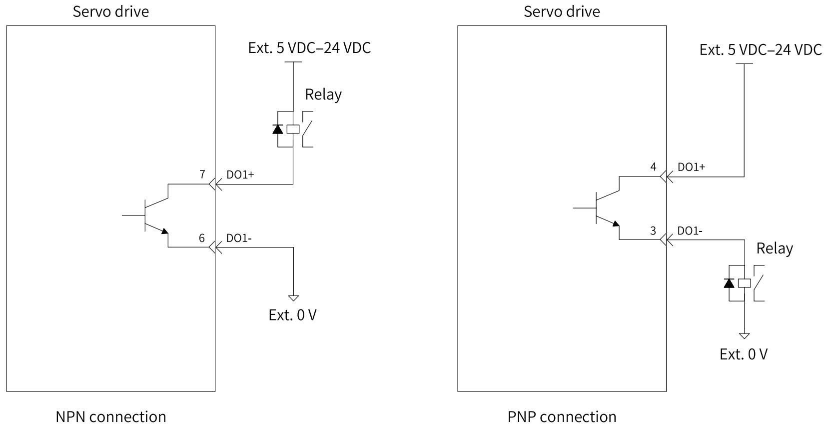
PNP and NPN input cannot be used together in the same circuit.

DO circuit

DO circuits of the drive are the same. The following takes DO1 circuit as an example.

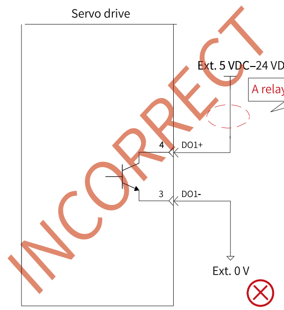
For DO terminal arrangement, see *"Table 6–7 Description of DI/DO signals" on page 108*.

- The host controller provides relay input.

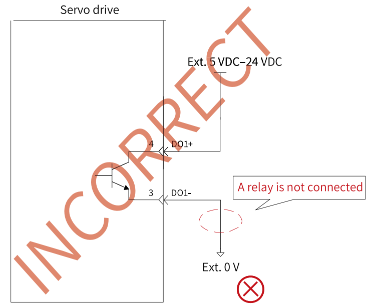


Note

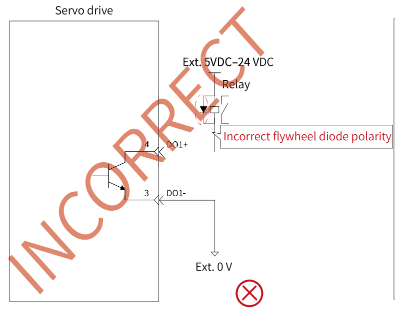
When the host controller provides relay input, a flywheel diode must be installed. Otherwise, the DO terminals may be damaged.



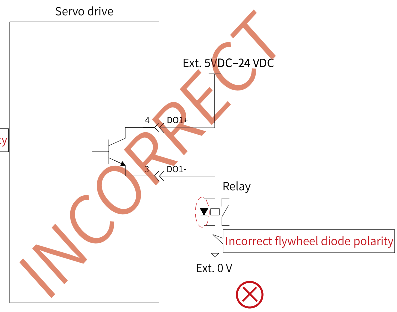
NPN connection



PNP connection

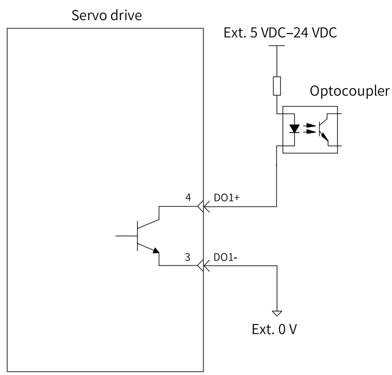


NPN connection

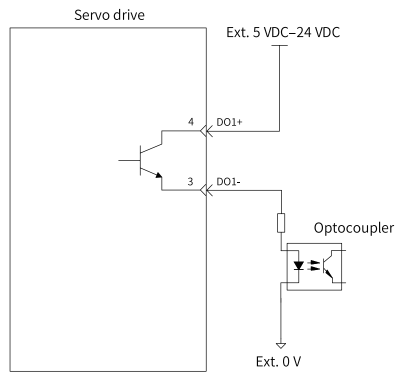


PNP connection

- The host controller provides optocoupler input:



NPN connection

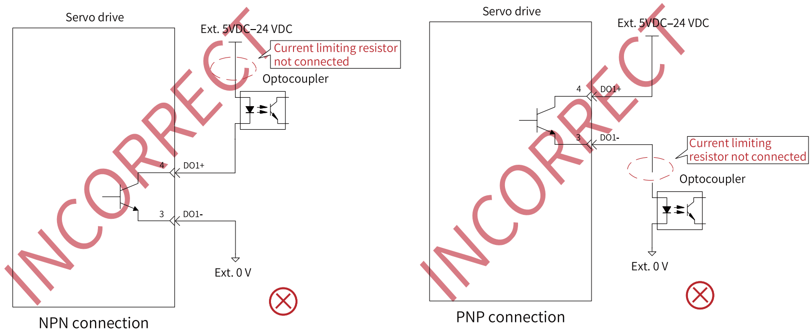


PNP connection

Note

The maximum permissible voltage and current capacity of the optocoupler output circuit inside the servo drive are as follows:

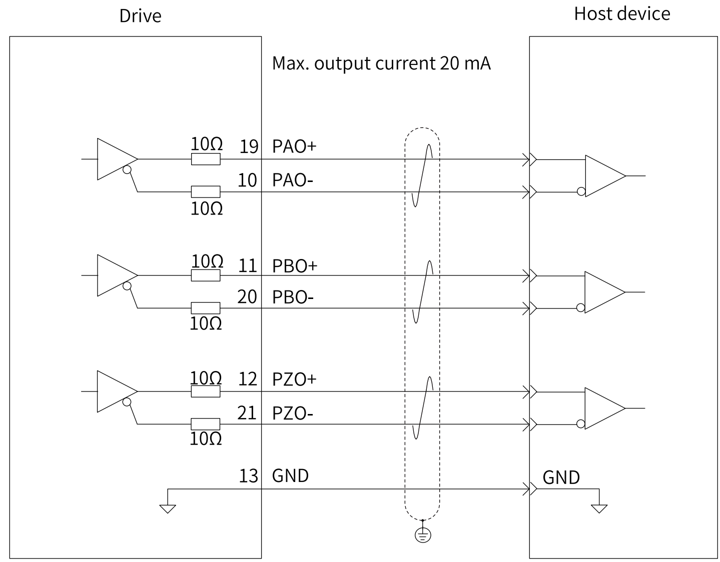
- Max. voltage: 30 VDC
- Max. current: DC 50 mA

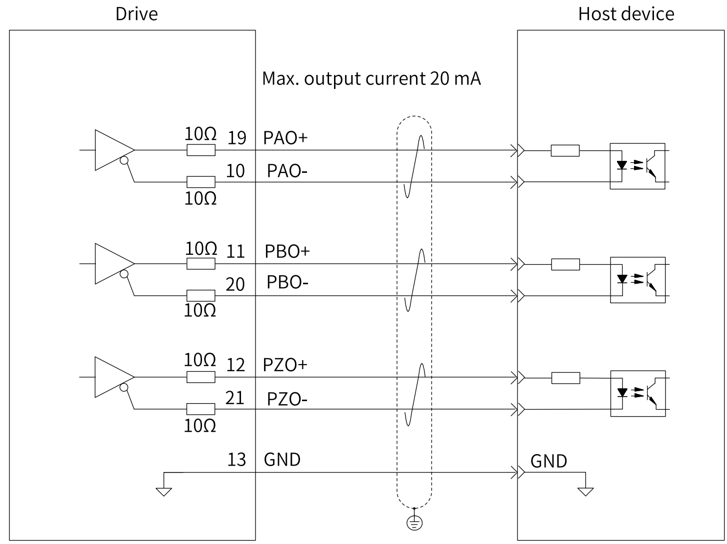


6.2.3.2 Encoder Frequency-Division Output Signals

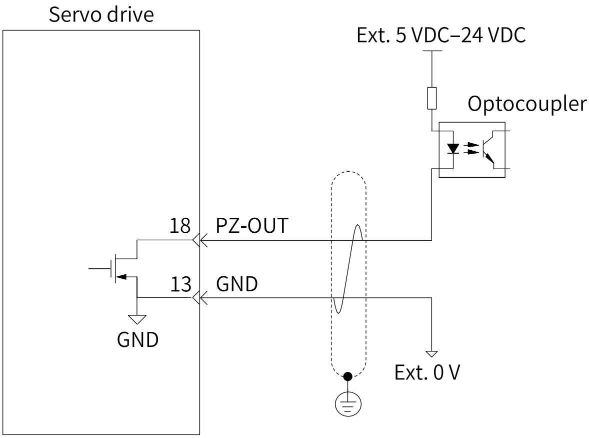
Encoder frequency-division output circuit outputs differential signals via the differential drive. Typically, this circuit provides feedback signals to the host controller in a position control system. Use a differential or optocoupler receiving circuit on the host controller side to receive feedback signals. The maximum output current is 20 mA.

For encoder frequency-division output signal terminal arrangement, see *"Table 6–8 Encoder frequency-division output signals" on page 108*.





Encoder phase Z output circuit outputs OC signals. Typically, this circuit provides feedback signals to the host controller in a position control system. An optocoupler circuit, relay circuit, or bus receiver circuit shall be used in the host controller to receive feedback signals.



Caution

To reduce noise interference, use shielded twisted pairs to connect the 5V GND of the host controller to the GND of the servo drive.

6.2.3.3 AI/AO Signals

For analog signal terminal arrangement, see *"Table 6–9 Specifications of AI/AO signals" on page 109*.

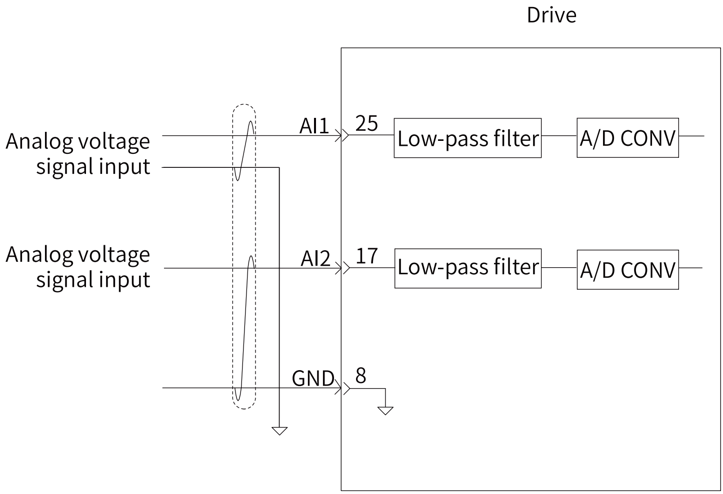
Analog input signal

The input terminal for analog speed and torque signals is AI1 and AI2.

AI1 is a voltage-type analog input terminal with a resolution of 16 bits. The voltage value is set in group H03.

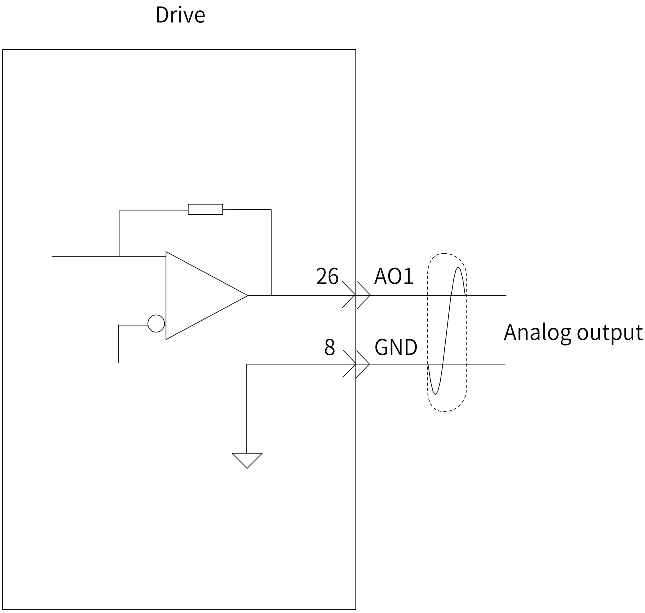
AI2 is a voltage-type analog input terminal with a resolution of 12 bits. The voltage value is set in group H03.

- Voltage-type input specification: –10 V to +10 V; maximum permissible voltage: ±12 V
- Input impedance: approx. 74 kΩ.



Analog output signal

The output terminal for analog speed and torque signals is AO1, supporting a voltage range of –10 V to +10 V. The voltage value is set in group H04.



6.2.4 Cable Requirements

Observe the requirements in standard EN 60204-1 during connecting control circuit cables.

I/O signal cable selection

It is recommended to use shielded signal cables to prevent I/O signal circuit from being disturbed by external noise. Use separate shielded cables for different analog signals. It is recommended to use shielded twisted pairs for digital signals.

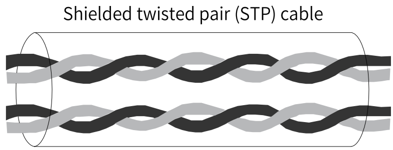


Figure 6-9 Diagram of shielded twisted pairs

Control Cable Specifications

Table 6–10 Recommended Control Cable Specifications

Control terminal	Connector Kit/Material No.	Recommended Lug Size (AWG)
CN1	DB26	16 to 26

6.3 CN2 Encoder Terminal

6.3.1 Terminal Pin Arrangement

Note

- Primary encoder: The main encoder.
- Secondary encoder: The slave encoder when the fully closed loop feature is used.

Terminal Pin Arrangement

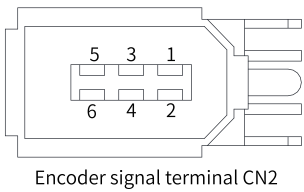


Figure 6-10 Terminal pin arrangement

Table 6–11 Pin assignment

Pin No.	Name	Description
1	5 V	5 V power supply (load current lower than 200 mA)
2	GND	5V power ground
3	PS4+/CLK+	1. PS± signal of the second encoder; 2. CLK± signal of the communication-type encoder
4	PS4-/CLK-	
5	PS3+/DATA+	1. PS± signal of 1st encoder 2. DATA± signal of the communication-type encoder
6	PS3-/DATA-	
Shell	PE	Shield

Note

It is recommended to use shielded twisted pair cables. Connect the shield layer to the CN2 terminal housing to reduce noise interference.

6.3.2 Wiring Precautions and Requirements

- Ground the shielded layers on both the servo drive side and the motor side. Otherwise, the servo drive will report a false alarm.
- Do not connect cables to the "reserved" terminals.
- Given the voltage drop caused by cable resistance and signal attenuation caused by distributed capacitance, it is recommended to use twisted-pair cables of 26AWG or above (as per UL2464 standard) with length no longer than 10 m as the encoder cable.

Note

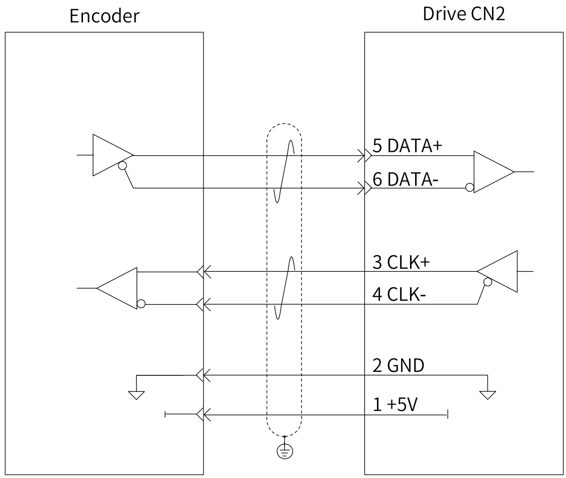
It is recommended to use 22AWG to 26AWG cables and a matching terminal AMP170359-1 for 10B, 20B, 40B, and 75B series motors. If a longer cable is required, increase the cable diameter properly. See *"6.3.4 Cable Requirements" on page 122* for details.

6.3.3 Wiring Examples

6.3.3.1 Communication with the First Encoder

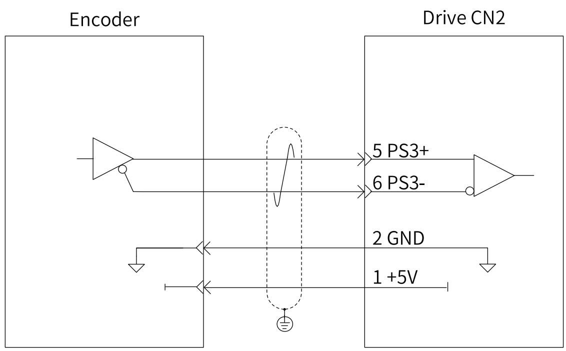
Wiring of Endat2.2/SSI/BiSS-C master encoder

The drive sends a clock signal to the master encoder, which exchanges data with the servo drive through a DATA signal.



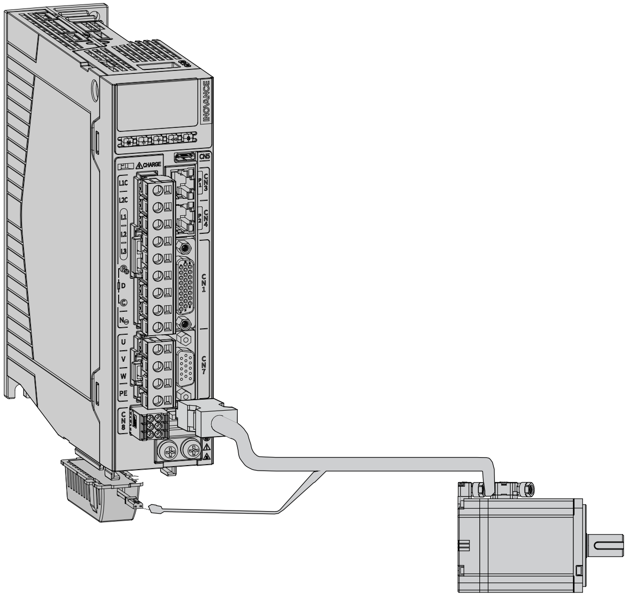
Wiring of the Inovance master encoder

The master encoder interacts with the servo drive through PS3+ and PS3-.



For cable requirements, see *"6.3.4 Cable Requirements" on page 122*.

Wiring of Inovance rotary motor



6.3.3.2 Communication with the Second Encoder

Set H0F.06 = 0, and change the port for the second encoder to CN2. It is connected to CN7 by default (H0F.06 = 1).

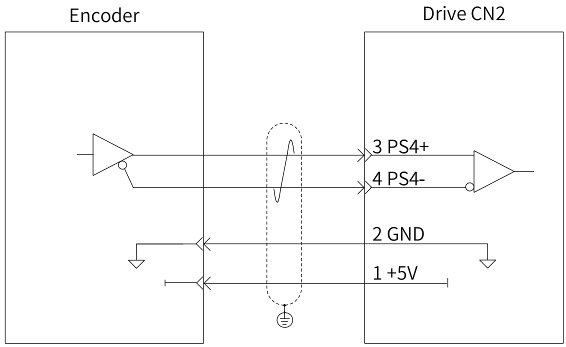
Wiring of Endat2.2/SSI/BISS-C second encoder

The drive communicates with the first encoder normally, that is, the first encoder exists all the time. In the case of the Endat2.2/SSI/BISS-C second encoder, the drive sends clock signals to the encoder and the encoder exchanges data with the drive through DATA signals.

For details, see *" Wiring of Endat2.2/SSI/BiSS-C master encoder" on page 120*.

Wiring of the Inovance second encoder

The drive communicates with the first encoder normally, that is, the first encoder exists all the time. For an Inovance second encoder, the encoder exchanges data with the drive through PS4+ and PS4- signals.



For cable requirements, see "6.3.4 Cable Requirements" on page 122.

6.3.4 Cable Requirements

Note

It is recommended to use 22AWG to 26AWG cables for 10B, 20B, 40B, and 75B series motors. If a longer cable is required, increase the cable diameter properly. See the following table for details.

Table 6–12 Recommended cables

Cable Size (AWG)	Line Resistance (Ω/km)	Allowable Length (m)
3P x 26	143	0 to 10
1P×22+2P×26	54.3	10 to 26.4
1P×20+2P×24	33.9	26.4 to 42.2
1P×18+2P×22	21.4	42.2 to 66.8
1P×16+2P×18	13.5	66.8 to 105.0

Note

- The above length can be increased by 2 m to 3 m.
- If the cables of above 16AWG are required, contact the sales personnel of Inovance.
- In the preceding table, P refers to two twisted pairs of cables. 1P: +5V/0V twisted pair; 2P: DC+/- twisted pair; PS+/- twisted pair; 3P: +5V/0V twisted pair; DC+/- twisted pair. PS+/- twisted pair.

6.3.5 Adapters of Power Cables and Encoder Cables

Recommended power cable connectors are Molex-39039062 and Molex-469990295. The recommended encoder cable is TE-1-172169-9. See the following figure.

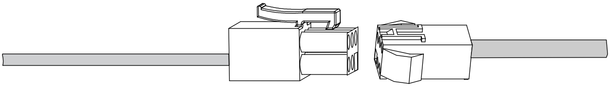


Figure 6-11 Power cable adapter

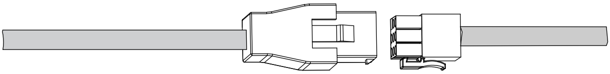


Figure 6-12 Encoder cable adapter

6.4 Communication Terminals CN3 and CN4

6.4.1 Communication Terminals CN3 and CN4

Terminal Pin Arrangement

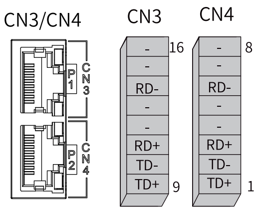


Figure 6-13 Communication Terminal pin layout of the servo drive

Table 6–13 PROFINET communication terminal pin assignment

Pin No.	Name	Description
1	TD+	Data transmit positive
2	TD-	Data transmit negative
3	RD+	Data reception+
4 and 5	-	-
6	RD-	Data reception–
7 and 8	-	-
9	TD+	Data transmit positive
10	TD-	Data transmit negative
11	RD+	Data reception+
12 and 13	-	-
14	RD-	Data reception–
15 and 16	-	-

Description

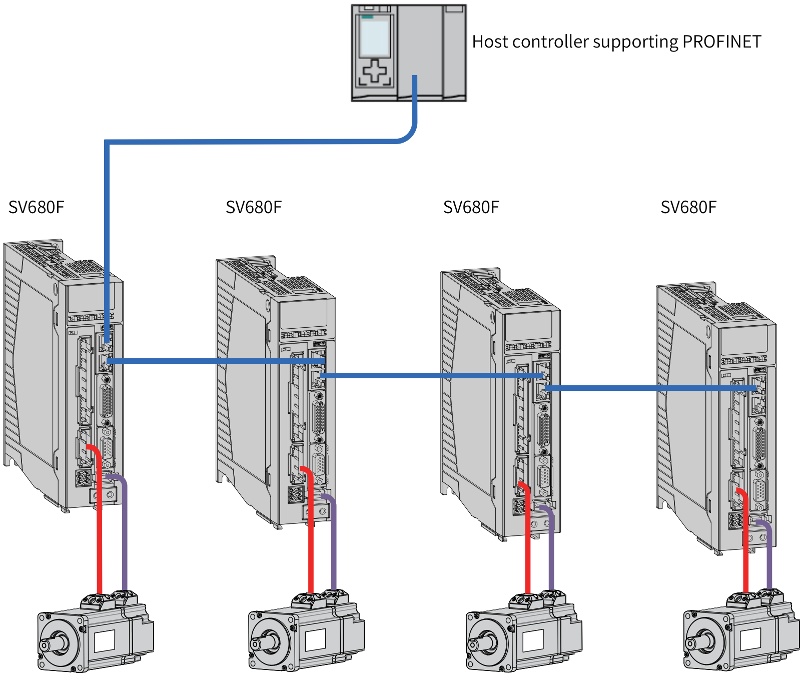


Figure 6-14 Communication network topology

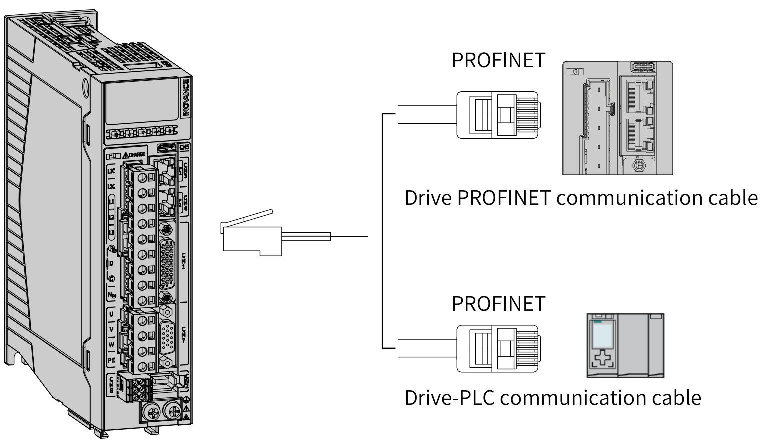


Figure 6-15 Wiring of communication cables

CN3 and CN4 are PROFINET communication port connectors. CN3(P1) is connected to the host controller, and CN4(P2) is connected to a slave. For assignment of CN3/CN4 terminal pins, see *"Table 6–13 PROFINET communication terminal pin assignment" on page 123*.

Note

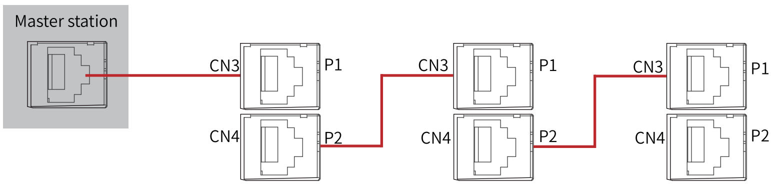
You can also use communication cables to connect the drive and PC through CN3 and CN4 terminals to achieve commissioning of an individual drive or simultaneous commissioning of multiple drives.

Terminal Wiring

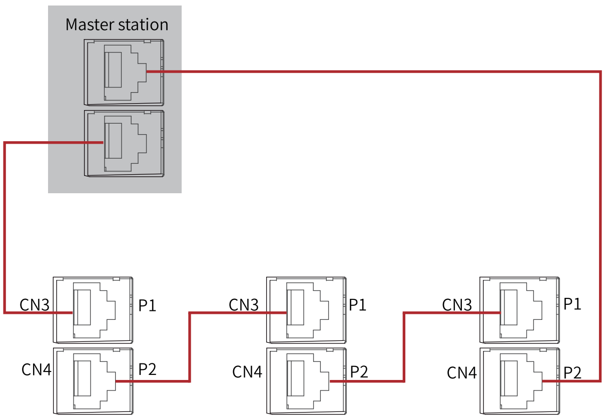
- Topology

  Profinet communication topology is flexible and basically has no restrictions. However, in IRT communication mode, the actual physical topology connection sequence must be consistent with the topology connection sequence configured by the PLC.

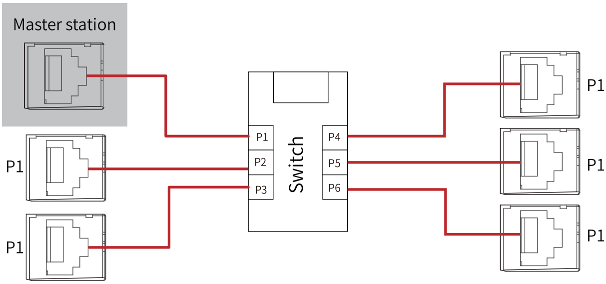
- Linear



- Redundant ring

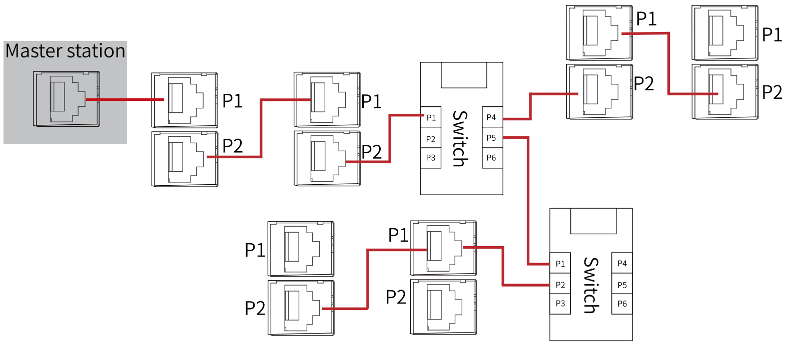


- Star



- Tree

  Tree



6.4.2 Cable Requirements

Rules

PROFINET cables are connected to the network ports (P1 and P2) equipped with the metal shield. The electric characters are compliant with IEEE 802.3 and ISO 8877 standards.

Communication cable types

Table 6–14 Cable data

Material Code	Cable Model	Cable Length (m)	Cable Length
15040261	S6-L-T04-0.3	0.3	CAT.5E 4-core cable
15040262	S6-L-T04-3.0	3.0	
15041960	S6-L-T04-0.2	0.2	
15041961	S6-L-T04-0.5	0.5	
15041962	S6-L-T04-1.0	1.0	
15041963	S6-L-T04-2.0	2.0	
15041964	S6-L-T04-5.0	5.0	
15041965	S6-L-T04-10.0	10.0	
1504QV45	S6-L-T07-0.3	0.3	CAT6A 8-core cable
1504QV46	S6-L-T07-1.0	1.0	
1504QV47	S6-L-T07-3.0	3.0	
1504QV49	S6-L-T08-0.3	0.3	CAT7 8-core cable
1504QV50	S6-L-T08-1.0	1.0	
1504QV51	S6-L-T08-3.0	3.0	

Communication cable specifications

Table 6–15 Specifications

Item	Description
UL	Compliant with UL certification
CAT.5E cable	CAT.5E 4-core cable
CAT6A cable	CAT6A 8-core cable
CAT7 cable	CAT7 8-core cable
Double shield	Braided shield (coverage: 85%), aluminum foil shield (coverage: 100%)
Ambient temperature	-40°C to +60°C.

Note

Application scenarios:

CAT.5E cable: suitable for home networks, and small and medium-sized enterprise networks.

CAT6A cable: suitable for data centers and applications requiring high-speed data transmission.

Cat7 cable: suitable for scenarios that require extremely high network performance, such as large enterprise networks, data centers, and high-definition video transmission.

Cable shield

The communication cable must be EtherNet Category 5 (100Base) network cable or high-strength shielded network cable. The cable for the servo drive must be the shielded network cable with the length no longer than 100 m. The shielded network cable enhances the anti-interference capacity of the system.

If you want to choose the communication cable yourself, you can refer to the related specifications provided by Beckhoff.

In the planning stage, always refer to the measurement data provided by the cable manufacturer. If the connection between the devices is moving, use flexible cables to avoid damage. If connectors are installed in a chemically corrosive environment, use cables with special coatings to avoid damage. If other environmental restrictions exist in the application, customized cables must be used according to the specific information provided by the cable manufacturer.

Selection of link cables (recommended by Beckhoff):

For permanent links, the cables must meet the angle value described in *"Table 6–16 References for fixed cables of a permanent link" on page 128* and *"Table 6–17 References for flexible cables of a permanent link" on page 128*.

Table 6–16 References for fixed cables of a permanent link

Characteristics	Type **A** cable (fixed)
Cable nominal impedance (tolerance)	100 Ω ± 15 Ω (IEC 61156-5)
Non-balanced or balanced	Balanced
DC round-trip resistance a	⩽ 115 Ω/km
Number of lead wires	4 (2 pairs)
Shield	S/FTQ
Transmission impedance	< 50 mΩ/m at 10 MHz
Installation type	Stationary, no movement after installation
Delay deviation	⩽ 20 ns/100 m
The DC round-trip resistance a (also called DC circuit resistance) is calculated by measuring the DC resistance of the two-way cable. That is, you connect two pairs of wires at one side of the cable and measure the resistance between the same wires at the other side. If the measured resistance between two ends of a single cable is about half of the value of the round-trip resistance, the corresponding reference value should also be ⩽ 57.5 Ω/km.	

Table 6–17 References for flexible cables of a permanent link

Characteristics	Type **B** cable (flexible)
Cable nominal impedance (tolerance)	100 Ω ± 15 Ω (IEC 61156-5)
Non-balanced or balanced	Balanced
DC round-trip resistance a	⩽ 115 Ω/km

Characteristics	Type **B** cable (flexible)
Number of lead wires	4 (2 pairs)
Shield	S/FTQ
Transmission impedance	< 50 mΩ/m at 10 MHz
Installation type	Flexible, occasional movement or vibration
Delay deviation	⩽ 20 ns/100 m
The DC round-trip resistance a (also called DC circuit resistance) is calculated by measuring the DC resistance of the two-way cable. That is, you connect two pairs of wires at one side of the cable and measure the resistance between the same wires at the other side. If the measured resistance between two ends of a single cable is about half of the value of the round-trip resistance, the corresponding reference value should also be ⩽ 57.5 Ω/km.	

Table 6–18 Cable example for a permanent link

	Fixed	Flexible
Shield	S/FTQ	S/FTQ
Round-trip resistance	⩽ 115 Ω/km	⩽ 115 Ω/km
Insertion loss (@100 MHz)	19.5 dB/100 m	21.3 dB/100 m
Near-end crosstalk (@100 MHz)	50 dB/100 m	50 dB/100 m

Only four cables are used for communication. Therefore, it is recommended to use four-conductor (two pairs) balanced Ethernet cables. You can also use four pairs of cables, provided that their performance in IL and NEXT is consistent with that of the four-conductor cables and does not exceed the angle value of the worst case reported in *"Table 6–16 References for fixed cables of a permanent link" on page 128* and *"Table 6–17 References for flexible cables of a permanent link" on page 128*. The unused cable pairs (especially if these cable pairs are not connected correctly to devices) will actually increase the signal crosstalk between adjacent cable pairs and reduce the cable performance.

6.5 Description of Communication Terminal (CN5)

Terminal Pin Arrangement

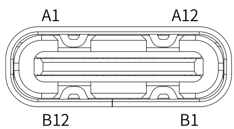


Table 6–19 Pin assignment of communication terminal (CN5)

Pin No.	Description	Description
A1 B1	GND	Signal reference ground
A4 B4	VBUS	USB power supply
A5 B5	-	-
A6 B6	DP	Differential data transmission
A7 B7	DN	Differential data transmission
A8 B8	-	-
A9 B9	VBUS	USB power supply
A12 B12	GND	Signal reference ground

Description

This terminal is a commissioning port connected with the PC. The communication cable must be of fast-charging Type-C with a magnetic ring. It must be equipped with a grounding wire, aluminum foil and metal shielding layer. Its length can be up to 3 m.

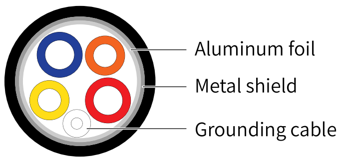


Figure 6-16 Recommended cables

Note

- Supports online upgrade and background commissioning when the drive is powered on.
- In USB mode, the terminal only supports download and upload of parameters, and driver firmware update.
- The terminal uses USB power supply. If there is a fault that cannot be completely reset, disconnect the USB power supply and drive control power, and then power on again.
- If you need more USB ports on the computer, use a properly-branded USB expansion module. In USB mode, to prevent power failure, it is recommended to use a USB expansion module with independent power supply.
- When the drive is only powered through USB, the drive may not be able to enter the USB mode and the display of the keypad will be abnormal due to insufficient power supply of the computer. Therefore, it is recommended to use the USB3.0 port or connect the control power to the drive.

6.6 CN6 STO Safety Terminal

6.6.1 CN6 STO Safety Terminal

Terminal Arrangement

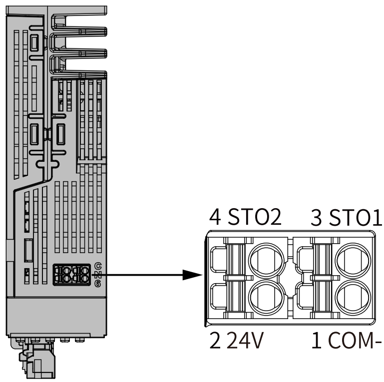


Table 6–20 Pin assignment

Pin No.	Description	Description
1	COM–	STO reference ground
2	24 V	Internal 24V power supply

Pin No.	Description	Description
3	STO1	Control input for STO1
4	STO2	Control input for STO2

Two isolated inputs are configured to dual-channel inputs of the STO function: STO1/STO2.

To facilitate commissioning, additional pin with supply voltage (+24V) is integrated. The bridging of the 24 V terminal to STO1/STO2 is needed in case the safety circuit is installed but no STO function is needed.

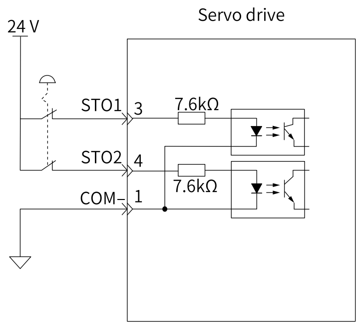
Description

- **Electrical specifications and connection of the input circuit**
  This section describes the characteristics of the input signals assigned to the CN6 connectors.
  - Specifications
    The servo drive operates normally only when the input states of STO1 and STO2 are both "High" ("1" or "H").

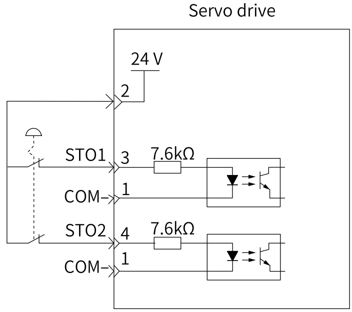
    The servo drive does not operate when the input states of STO1 or STO2 are different or are both "Low" ("0" or "L").
  - Electrical characteristics of Safety Request Input Signal are as follows:

Item	Characteristics	Description
Voltage range	24 VDC (±15%)	-
Input current	3.6 mA (Typ.)	The input current of STO1 and STO2.
Standards of logic levels	“0” < 5 V, “1” > 15 V	-
Digital input impedance	6.6 kΩ	-

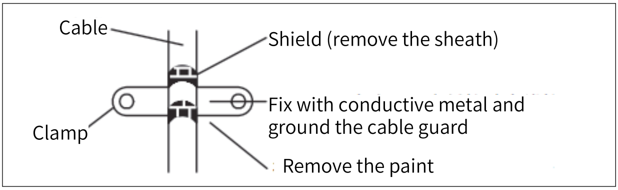
  - Connection example of external 24 V



  - Connection example of internal 24 V



- **EMC requirements**
  - To avoid short circuit between two adjacent conductors, either use cable with shield connected to the protective bonding circuit on each separate conductor, or use flat cables with one earthed conductor between each signal conductor.
  - Double-shielded or single-shielded twisted multi-pair cable is strongly recommended.
  - Fix and ground the cable shield using a piece of conductive metal.
    Example of cable clamp:



  - The maximum allowable cable length between the drive and the activation switch is 30 m.

- **Other requirements**
  - All wiring must be well protected, routed and clamped where practicable.
  - It must be assured that there is no pulling or pinching on the cable when installing.
  - For cabling the DI inputs of the STO, to avoid common cause failure in the cables, the two channels must be routed through two well-apart routes, or the cable must be protected with double-shielded methods.

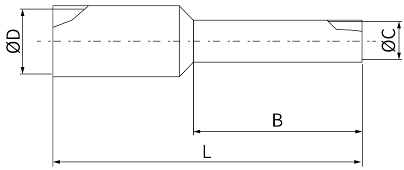
Cable	Description
Category	Low voltage, double-shielded or single-shielded twisted multi-pair cable
Maximum size	0.8 mm^2 (18AWG)
Minimum size	0.3 mm^2 (28AWG)
Maximum length	The max. distance between STO input and the operating contact is 30 m

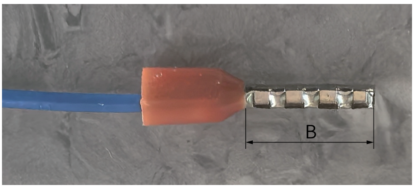
Applicable servo drives

STO applies to the following servo drives:

Size	Power Range (kW)	Structure	W×H×D (mm^3)
A	0.2 to 0.4	Split-type structure	45.5 x 170 x 150
C	0.75 to 1.5	Split-type structure	55 x 170 x 173
D	1.5 to 3	Split-type structure	80 x 170 x 183
E	2 to 7.5	Split-type structure	90 x 250 x 230

6.6.2 Wiring Precautions and Requirements

<table>
<tr><th>Pre-Inspection</th><th>Installation</th></tr>
<tr><td>




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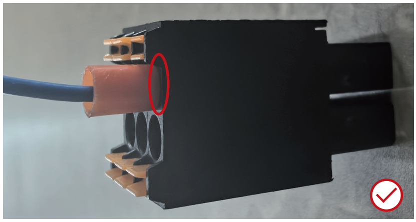
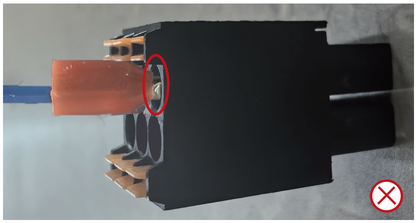


</td></tr>
<tr><td>Tubular terminal contact area (B) ≤ 8 mm</td><td>Connect the terminal in place so that the contact area is not exposed.</td></tr>
</table>

6.7 CN7 Encoder Terminal

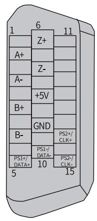
6.7.1 Terminal Pin Arrangement

Note

- First encoder: The master encoder.
- Second encoder: The slave encoder when the fully closed loop feature is used.

Terminal Pin Arrangement

CN7



Pin No.	Terminal Definition	Description	Pin No.	Terminal Definition	Description
1	A+	Encoder pulse phase A±	9	GND	Power supply reference ground
2	A–		10	PS1-/DATA-	• PS- signal of the first encoder • DATA- signal of the communication encoder
3	B+	Encoder pulse phase B±	11	-	-
4	B–		12	-	-
5	PS1+/DATA+	• PS+ signal of the first encoder • DATA+ signal of the communication encoder	13	-	-
6	Z+	Encoder pulse phase Z±	14	PS2+/CLK+	• PS+/- signals of the second encoder • CLK+/- signals of the communication encoder
7	Z-		15	PS2-/CLK-	
8	+5 V	Encoder 5 V power supply (load current lower than 200 mA)	Shell	PE	Shield

6.7.2 Cable Requirements

Note

It is recommended to use 22AWG to 26AWG cables for 10B, 20B, 40B, and 75B series motors. If a longer cable is required, increase the cable diameter properly. See the following table for details.

Table 6–21 Recommended cables

Cable Size (AWG)	Line Resistance (Ω/km)	Allowable Length (m)
3P x 26	143	0 to 10
1P×22+2P×26	54.3	10 to 26.4
1P×20+2P×24	33.9	26.4 to 42.2
1P×18+2P×22	21.4	42.2 to 66.8
1P×16+2P×18	13.5	66.8 to 105.0

Note

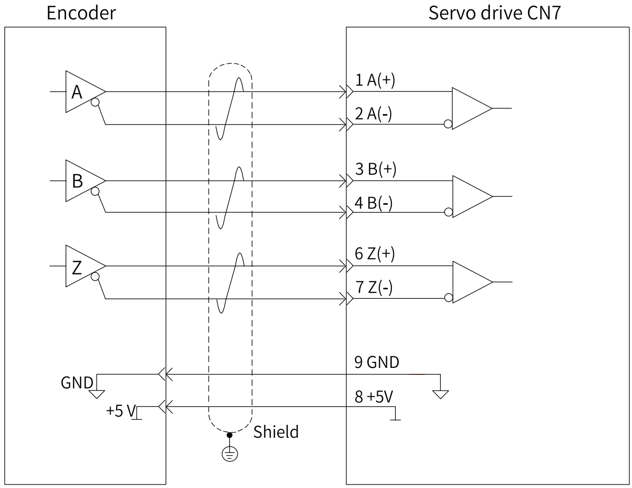
- The above length can be increased by 2 m to 3 m.
- If the cables of above 16AWG are required, contact the sales personnel of Inovance.
- In the preceding table, P refers to two twisted pairs of cables. 1P: +5V/0V twisted pair; 2P: DC+/- twisted pair; PS+/- twisted pair; 3P: +5V/0V twisted pair; DC+/- twisted pair. PS+/- twisted pair.

6.7.3 Wiring Examples

6.7.3.1 Communication with the First Encoder

Wiring of ABZ incremental encoder (TTL signal)

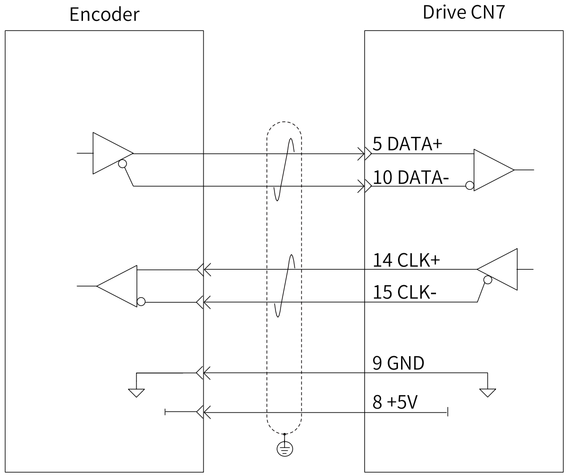
Use shielded twisted pairs to match the high input frequency.



- To reduce noise interference, connect the reference ground of the external encoder to the GND of the drive. Use shielded cables and connect the shield to the CN7 terminal enclosure.
- The input mode of the external encoder is differential input.
- The maximum pulse frequency supported by a phase A/B linear encoder is 4 Mpps.
- The pulse input terminal of a phase A/B encoder supports open circuit detection.

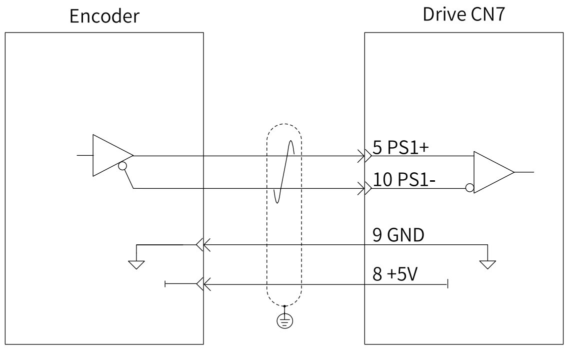
Wiring of Endat2.2/SSI/BiSS-C master encoder

The drive sends a clock signal to the master encoder, which exchanges data with the servo drive through a DATA signal.



Wiring of the Inovance master encoder

The master encoder interacts with the servo drive through PS1+ and PS1-.



For cable requirements, see *"6.7.2 Cable Requirements" on page 135*.

6.7.3.2 Communication with the Second Encoder

The second encoder is connected to the CN7 port (H0F.06 = 1) by default.

Wiring of ABZ incremental encoder (TTL signal)

For details, see *" Wiring of ABZ incremental encoder (TTL signal)" on page 136*.

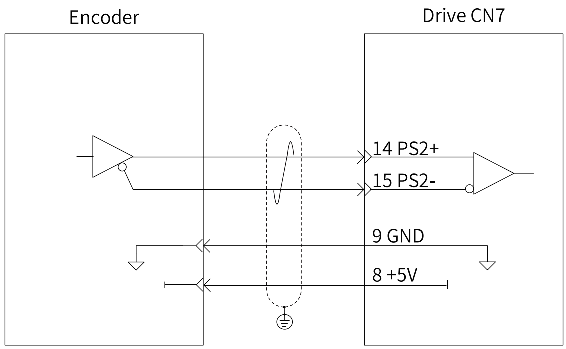
Wiring of Endat2.2/SSI/BiSS-C second encoder

The drive communicates with the first encoder normally, that is, the first encoder exists all the time. In the case of the Endat2.2/SSI/BiSS-C second encoder, the drive sends clock signals to the encoder and the encoder exchanges data with the drive through DATA signals.

For details, see *" Wiring of Endat2.2/SSI/BiSS-C master encoder" on page 137*.

Wiring of the Inovance second encoder

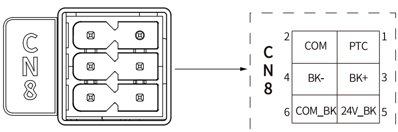
The drive communicates with the first encoder normally, that is, the first encoder exists all the time. For an Inovance second encoder, the encoder exchanges data with the drive through PS2+ and PS2- signals.



For cable requirements, see *"6.7.2 Cable Requirements" on page 135*.

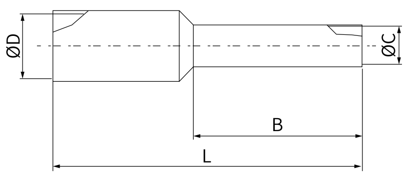
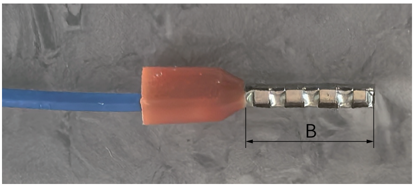
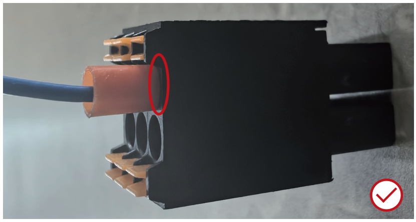
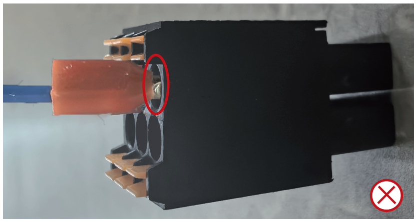
6.8 Description of Brake and PTC Input Terminal (CN8)

6.8.1 Terminal Pin Arrangement



Pin No.	Description	Description	Pin No.	Description	Description
1	PTC	Motor temperature feedback input	2	COM–	Onboard 24V, COM
3	BK+	Brake+	4	BK-	Brake–
5	24V_BK	External power supply for the brake	6	COM_BK	Brake 24V, COM

6.8.2 Wiring Precautions and Requirements

Pre-Inspection	Installation
 	 
Tubular terminal contact area (B) ⩽ 8 mm	Connect the terminal in place so that the contact area is not exposed.

6.8.3 Wiring Examples

6.8.3.1 PTC Wiring Example

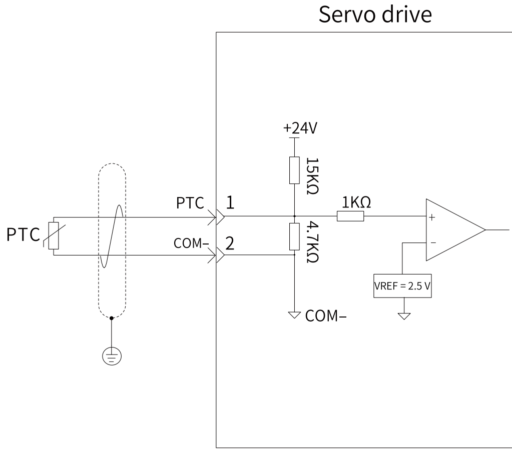


Figure 6-17 PTC wiring diagram

Note

- The resistance range triggering PTC circuit overtemperature operation is 1.8 kΩ to 3.85 kΩ. When selecting PTC, note that the PTC resistance value must be less than 1.8 kΩ when the PTC does not operate, and larger than 3.85 kΩ when the PTC operates for overtemperature.
- Only switching thermistors are supported. Connect the shielded cable between the servo drive and the motor properly during wiring.

6.8.3.2 Brake Wiring Examples

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

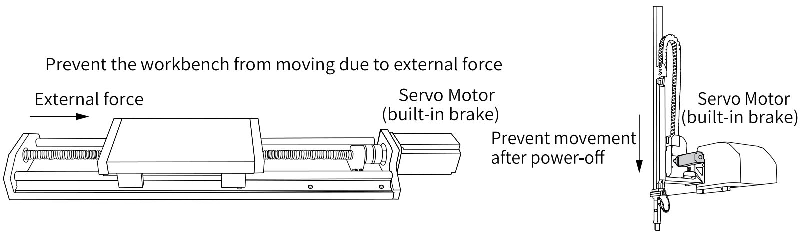
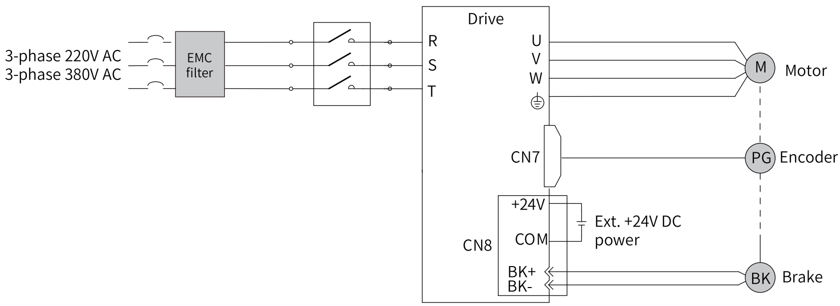


Figure 6-18 Application of the brake

Caution

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

The connection of the motor brake input signal has no polarity. You need to prepare a separate 24 V power supply to ensure that the control power supply is separate from the brake power supply. The following figure shows the standard wiring of the brake signals (BK) and the brake power supply.



Pay attention to the following precautions during wiring:

When determining the length of the motor brake cable, take full account the voltage drop caused by cable resistance. The input voltage must be 24 V±10% to enable the brake to work properly.

Note

- In the standard environment, the number of brake outputs at the drive side can reach at least 5 million. For details on the standard environment, see " " on page .
- The brake must not share the power supply with other electrical devices. This is to prevent a malfunction of the brake due to a drop in the voltage or current when other electrical devices work in tandem.
- Use cables with a cross-sectional area above 0.5 mm^2.

6.9 Wiring and Setting of the Braking Resistor

When the capacitance of the bus is insufficient, the extra energy can be consumed by connecting an external braking resistor to the P ⊕ -C terminal.

When the motor torque direction is opposite to the direction of rotation, the energy is fed back to the servo drive from the motor side, leading to bus voltage rise. Once the bus voltage rises to the braking threshold, the excessive energy must be consumed by a braking resistor. Otherwise, the servo drive will be damaged. The braking resistor can be a built-in or an external one. The internal and built-in braking resistors must not be used together.

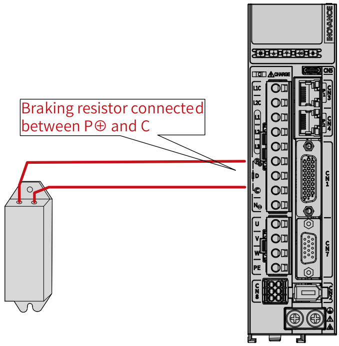


Figure 6-19 Wiring of external braking resistor

Recommended cables for terminals P ⊕ and C: For CE, see *"9.1.3 Cable Specifications (CE)" on page 512*. For UL, see *"9.2.1 Cable Specifications (UL)" on page 518*.

Caution

Observe the following precautions when connecting the external braking resistor:

- The built-in braking resistor or jumper bar is not available in models S1R6 and S2R8. If an external braking resistor is needed for these models, connect it between terminals P ⊕ and C.
- Remove the jumper between terminals P⊕ and D before using the external braking resistor. Failure to comply will result in overcurrent and damage the braking transistor.
- Do not connect the external braking resistor to the positive or negative pole of the bus directly. Failure to comply will damage the servo drive and result in a fire.
- Select a resistor with resistance higher than or equal to the minimum permissible value. Failure to comply will result in E201 (Overcurrent) or damage the servo drive.
- Make sure parameters H02.25 (Braking resistor setting), H02.26 (Power of external braking resistor) and H02.27 (Resistance of external braking resistor) are set properly before operating the servo drive.
- Install the external braking resistor on incombustible matters (such as metal).

7 Solutions to Common EMC Problems

7.1 Residual Current Device Malfunction

If a residual current device (RCD) is needed, select the RCD according to the following requirements:

- Use a B-type RCD because the drive may generate DC leakage current in the protective conductor.
- For each drive, use an RCD whose tripping current is not lower than 100 mA to prevent RCD malfunction due to high-frequency leakage current generated by the drive.
- When multiple drives are connected in parallel and share one RCD, select an RCD whose tripping current is not lower than 300 mA.
- It is recommended to use Chint or Schneider RCDs.

When malfunction occurs on the RCD, take the following measures.

Table 7–1 Measures against leakage current

<table>
<tr><th>Symptom</th><th>Possible Cause</th><th>Solution</th></tr>
<tr><td rowspan="4">The RCD trips at the moment of power-on.</td><td>The anti-interference performance of the RCD is weak.</td><td rowspan="4">• It is recommended to use Siemens or Schneider RCDs.
• Use a RCD with a higher tripping current.
• Move the unbalanced load to the front end of the RCD.</td></tr>
<tr><td>The tripping current of the RCD is too low.</td></tr>
<tr><td>An unbalanced load is connected to the rear end of the RCD.</td></tr>
<tr><td>The capacitance of the front end of the servo drive is too high.</td></tr>
<tr><td rowspan="4">The RCD trips during operation.</td><td>The anti-interference performance of the RCD is weak.</td><td rowspan="4">• It is recommended to use Siemens or Schneider RCDs.
• Use a RCD with a higher tripping current.
• Install a simple filter on the input side of the drive and wind the magnetic ring on the LN and RST cables near the RCD, as shown in "Figure 7–1 Magnetic ring on the input side" on page 144.
• Reduce the carrier frequency without compromising the performance.
• Reduce the length of motor cables.</td></tr>
<tr><td>The tripping current of the RCD is too low.</td></tr>
<tr><td>An unbalanced load is connected to the rear end of the RCD.</td></tr>
<tr><td>For motor cables and the motor, the distributed capacitance to ground is too high.</td></tr>
</table>

Figure 7-1 Magnetic ring on the input side

7.2 Harmonic Suppression

To suppress harmonics and improve the power factor to allow the drive to fulfill the standards, install an AC input reactor on the input side of the drive. For details about reactor models, see *"2.4.1.4 AC Input Reactor" on page 34*. For details about the installation method, see *"3.4.2 Instructions for Installing the AC Input Reactor" on page 74*.

7.3 Control Circuit Interference

7.3.1 High-speed Pulse Interference

Take the measures listed in the following table to suppress interference.

No.	Step
1	Used shielded twisted pair cables with both ends of the cable grounded (see *" I/O signal cable selection" on page 118*).
2	Connect the motor enclosure to the PE terminal of the drive.
3	Connect the PE terminal of the drive to the PE terminal of the mains power supply.
4	Add an equipotential bonding grounding cable between the host controller and drive (see *" Grounding the control cabinet system" on page 103*).
5	Separate signal cables from power cables with a distance of at least 30 cm.
6	Wind the signal cable onto a ferrite clamp or magnetic ring for one to two turns (see *"3.4.4 Instructions for Installing the Magnetic Ring and Ferrite Clamp" on page 75*).
7	At the drive output side, wind the output U/V/W cable onto a magnetic ring for two to four turns. For details, see *"3.4.4 Instructions for Installing the Magnetic Ring and Ferrite Clamp" on page 75*.
8	Use shielded power cables and ground the shield properly.

7.3.2 Interference with Control Circuit Wiring

For analog/frequency-division input/fully closed-loop wiring, see *"7.3.1 High-speed Pulse Interference" on page 145* for details.

7.3.3 Common I/O Signal Interference

The drive generates strong interference during operation. Although EMC measures are taken, interference may still exist due to improper wiring or grounding during use. When the drive disturbs or is disturbed by other devices, adopt the following measures.

No.	Step
1	Use shielded cables as the I/O signal cables and connect the shield to the PE terminal. For details, see *" I/O signal cable selection" on page 118*.
2	Reliably connect the PE terminal of the motor to the PE terminal of the servo drive, and connect the PE terminal of the servo drive to the PE terminal of the grid.
3	Add an equipotential bonding grounding wire between the host controller and the servo drive.
4	At the drive output side, wind the output U/V/W cable onto a magnetic ring for two to four turns. For details, see *"3.4.4 Instructions for Installing the Magnetic Ring and Ferrite Clamp" on page 75*.
5	Increase the filter capacitance for low-speed DIs. A capacitance up to 0.1 µF is recommended, as shown in *"Figure 7–2 I/O signal cables with capacitance increased" on page 146*.
6	Increase the filter capacitance between AI and GND. A capacitance up to 0.22 µF is recommended.
7	Wind the signal cable onto a ferrite clamp or magnetic ring for one to two turns (see *"3.4.4 Instructions for Installing the Magnetic Ring and Ferrite Clamp" on page 75*).
8	Use shielded power cables and ground the shield properly.

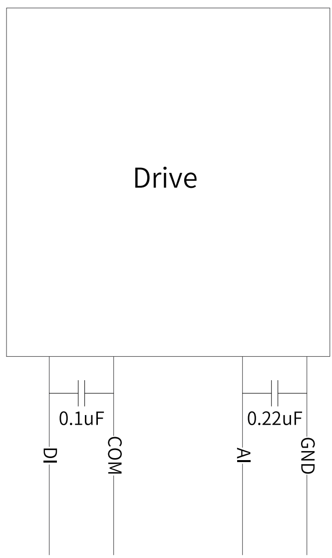


Figure 7-2 I/O signal cables with capacitance increased

8 Description

8.1 H00 Servo Motor Parameters

H00.00 **Motor SN**

Address:	0x0000	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	14102	Change:	At stop

Value Range:

20002: Rotary motor-pulse encoder
14000: Rotary motor-Inovance 20-bit encoder
14101: Rotary motor-Inovance 23-bit encoder
14102: Rotary motor-Inovance 26-bit encoder
14140: Rotary motor-Endat2.2 encoder
14150: Rotary motor-SSI encoder
14160: Rotary motor-BiSS-C encoder

Description

20002: Rotary motor-pulse encoder
14000: Rotary motor-Inovance 20-bit encoder
14101: Rotary motor-Inovance 23-bit encoder
14102: Rotary motor-Inovance 26-bit encoder
14140: Rotary motor-Endat2.2 encoder. Before using it, set H0A.35 to 1
14150: Rotary motor-SSI encoder
14160: Rotary motor-BiSS-C encoder

H00.02 **Customized No.**

Address:	0x0002	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	42949672.95	Data Type:	UInt32
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 42949672.95

Description

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

H00.04 **Encoder version**

Address:	0x0004	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

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

H00.05 **Serial-type motor code**

Address:	0x0005	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

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

H00.06 **FPGA customized SN**

Address:	0x0006	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

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

H00.07 **STO version**

Address:	0x0007	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Display the software version number of STO function.

H00.08 **Bus encoder type**

Address:	0x0008	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

14100: Multi-turn absolute encoder

Others: Single-turn absolute encoder

H00.14 **Rated speed**

Address:	0x000E	Effective mode:	Upon the next power-on
Min.:	50	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	At stop

Value Range:

50rpm to 10000rpm

Description

Set the motor rated speed.

H00.15 **Maximum speed**

Address:	0x000F	Effective mode:	Upon the next power-on
Min.:	50	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	6000	Change:	At stop

Value Range:

50rpm to 10000rpm

Description

Set the maximum motor speed.

H00.40 **Motor control type**

Address:	0x0028	Effective mode:	Upon the next power-on

Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0: General-purpose rotary motor ROT

Description

The motor type supported by the drive.

0: General-purpose rotary motor ROT

H00.41 **Master encoder configuration**

Address:	0x0029	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Unchangeable

Value Range:

0: CN2

1: CN7

Description

Set the terminal for the master encoder.

H00.43 **Number of BiSS-C/SSI/EnDat2.2 data bits**

Address:	0x002B	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	40	Data Type:	UInt16
Default:	32	Change:	At stop

Value Range:

0 to 40

Description

Defines the length of the data configured based on BiSS-C/SSI/EnDat2.2 protocol.

H00.44 **Number of BiSS-C/SSI fault bits**

Address:	0x002C	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0 to 31

Description

Defines the length of the fault configured based on BiSS-C/SSI protocol.

H00.54 BiSS-C/SSI CRC

Address:	0x0036	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0 to 1

Description

Defines the CRC polarity of the BiSS-C/SSI protocol.

0: Positive

1: Negative

H00.59 Encoder counting direction

Address:	0x003B	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Forward

1: Reverse

Description

Motor phase sequence:

0: Forward

1: Reverse

H00.65 Motor rated current

Address:	0x0041	Effective mode:	Upon the next power-on
Min.:	0.00	Unit:	A
Max.:	42949672.95	Data Type:	UInt32
Default:	1.00	Change:	At stop

Value Range:

0.00 A to 42949672.95 A

Description

Set the rated current.

H00.69 Linear back EMF coefficient

Address:	0x0045	Effective mode:	Upon the next power-on
Min.:	0.00	Unit:	[V/(m/s)]/[100mV/rpm]
Max.:	42949672.95	Data Type:	UInt32
Default:	33.00	Change:	At stop

Value Range:

0.00[V/(m/s)]/[100mV/rpm]–42949672.95[V/(m/s)]/[100mV/rpm]

Description

Set the Linear back EMF coefficient.

8.2 H01 Servo Drive Parameters

H01.00 MCU software version

Address:	0x0100	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Displays MCU software version (with one decimal place).

H01.01 FPGA software version

Address:	0x0101	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Displays the FPGA software version, with 1 decimal place.

H01.02 Servo drive series No.

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

Value Range:

0 to 65535

Description

Display servo drive serial number, with 0 decimal place.

H01.06 **Board software version**

Address:	0x0106	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Display board software version number, with 1 decimal place.

H01.10 **Drive series No.**

Address:	0x010A	Effective mode:	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**

Address:	0x010B	Effective mode:	-
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 **Drive rated power**

Address:	0x010C	Effective mode:	-
Min.:	0.00	Unit:	kW
Max.:	42949672.95	Data Type:	UInt32
Default:	0.40	Change:	Unchangeable

Value Range:

0.00 kW–42949672.95 kW

Description

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

H01.14 **Max. output power of the drive**

Address:	0x010E	Effective mode:	-
Min.:	0.00	Unit:	kW
Max.:	42949672.95	Data Type:	UInt32
Default:	0.40	Change:	Unchangeable

Value Range:

0.00 kW–42949672.95 kW

Description

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

H01.16 **Rated output current of the drive**

Address:	0x0110	Effective mode:	-
Min.:	0.00	Unit:	A
Max.:	42949672.95	Data Type:	UInt32
Default:	2.80	Change:	Unchangeable

Value Range:

0.00 A to 42949672.95 A

Description

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

H01.18 Max. output current of the drive

Address:	0x0112	Effective mode:	-
Min.:	0.00	Unit:	A
Max.:	42949672.95	Data Type:	UInt32
Default:	10.10	Change:	Unchangeable

Value Range:

0.00 A to 42949672.95 A

Description

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

H01.40 DC bus overvoltage protection threshold

Address:	0x0128	Effective mode:	Real-time
Min.:	0	Unit:	V
Max.:	2000	Data Type:	UInt16
Default:	420	Change:	Real-time

Value Range:

0 V to 2000 V

Description

Displays DC bus overvoltage protection threshold, with 0 decimal place.

H01.88 Junction temperature parameter version 1

Address:	0x0158	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Displays version 1 of the junction temperature parameter.

H01.89 Junction temperature parameter version 2

Address:	0x0159	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays version 2 of the junction temperature parameter.

8.3 H02 Basic Control Parameters

H02.00 **Control mode**

Address:	0x0200	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	11	Data Type:	UInt16
Default:	11	Change:	At stop

Value Range:

11: PN communication mode

Description

11: PN communication mode

H02.01 **Absolute system selection**

Address:	0x0201	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	5	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

5: Absolute position rotational mode, modal axis single modal revolution absolute command

Description

Absolute system mode 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
5: Absolute position rotational mode, modal axis single modal revolution absolute command

H02.02 **Rotation direction selection**

Address:	0x0202	Effective mode:	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.
0: Counterclockwise (CCW) as forward direction
1: Clockwise (CW) as forward direction

H02.03 **Output pulse phase**

Address:	0x0203	Effective mode:	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.
0: Phase A leads phase B
1: Phase A lags behind phase B

H02.05 **Stop mode at S-ON OFF**

Address:	0x0205	Effective mode:	At stop

Min.:	-5	Unit:	-
Max.:	3	Data Type:	Int16
Default:	3	Change:	Real-time

Value Range:

–5: Stop in PN communication state (ramp/quick/coast to stop), keeping DB state: ramp stop when OFF1 is active, coast to stop when OFF2 is active, quick stop when OFF3 is active, and coast to stop when all are inactive
-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, keeping dynamic braking state
3: Stop in PN communication state (ramp/quick/coast to stop), keeping de-energized state: ramp stop when OFF1 is active, coast to stop when OFF2 is active, quick stop when OFF3 is active, and coast to stop when all are inactive

Description

Defines the deceleration mode of the motor for stopping rotating upon S-ON OFF and the motor status after stop.
Set a proper stop mode according to the mechanical status and operation requirements.
-5: Stop in PN communication state (ramp/quick/coast to stop), keeping DB state: ramp stop when OFF1 is active, coast to stop when OFF2 is active, quick stop when OFF3 is active, and coast to stop when all are inactive
–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 by ramp 1, keeping de-energized state
2: Dynamic braking stop, keeping de-energized state
3: Stop in PN communication state (ramp/quick/coast to stop), keeping de-energized state: ramp stop when OFF1 is active, coast to stop when OFF2 is active, quick stop when OFF3 is active, and coast to stop when all are inactive
Note: After the brake is enabled, H02.05 will be forcibly set to "-4: Ramp to stop, keeping DB state".

H02.06 **Stop mode at No. 2 fault**

Address:	0x0206	Effective mode:	At stop

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

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.
Note: If the brake is enabled, H02.06 is forced to –3: Stop by ramp 2, keeping dynamic braking state.

H02.07 **Stop mode at overtravel**

Address:	0x0207	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1: Stop at zero speed, keeping position lock state
4: Stop at ramp 2, keeping position lock state
7: Not respond to overtravel

Description

Defines the deceleration mode of the motor for stopping rotating upon overtravel and the motor status after stop.
When the servo motor drives vertical axis, your setting must make the motor axis in position locking state after the limit switch signal is active to ensure safety.
1: Stop at zero speed, keeping position lock state
4: Stop at ramp 2, keeping position lock state
7: Not respond to overtravel
Note: After the brake function is enabled, H02.07 will be forcibly set to "4: Ramp to stop, keeping position lock state".

H02.08 Stop mode at No.1 fault

Address:	0x0208	Effective mode:	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.

0: Coast to stop, keeping de-energized state

1: Dynamic braking stop, keeping de-energized status

2: Dynamic braking stop, keeping de-energized state

Note: After the brake is enabled, H02.08 is forced to "2: Dynamic braking stop, keeping dynamic braking state".

H02.09 Delay from brake output ON to command received

Address:	0x0209	Effective mode:	At stop
Min.:	0	Unit:	ms
Max.:	500	Data Type:	UInt16
Default:	250	Change:	Real-time

Value Range:

0 ms–500 ms

Description

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

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

Address:	0x020A	Effective mode:	Real-time
Min.:	50	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	150	Change:	Real-time

Value Range:

50 ms–1000 ms

Description

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

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

Address:	0x020B	Effective mode:	Real-time
Min.:	20	Unit:	rpm
Max.:	3000	Data Type:	UInt16
Default:	30	Change:	Real-time

Value Range:

20 rpm to 3000 rpm

Description

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

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

Address:	0x020C	Effective mode:	Real-time
Min.:	1	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	500	Change:	Real-time

Value Range:

1 ms–65535 ms

Description

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

H02.15 LED Alarm Display

Address:	0x020F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output alarm information immediately

1: Not output alarm information

Description

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

0: Output alarm information immediately

1: Not output alarm information

H02.16 Brake enable switch

Address:	0x0210	Effective mode:	At stop

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

Value Range:

0: OFF

1: ON

Description

Turn on or off the brake function.

0: OFF

1: ON

H02.17 Stop mode upon main circuit power failure

Address:	0x0211	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	Real-time

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.

0: Keep current action

1: Stop upon fault as defined by H02.06

2: Stop at S-ON OFF as defined by H02.053: Stop quickly as defined by H02.18

H02.18 DI emergency stop mode

Address:	0x0212	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:

0: Coast to stop, keeping de-energized state

1: Ramp 1 stop, keeping de-energized state

2: Ramp 2 stop, keeping de-energized stat

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

Description

Defines the deceleration mode of the motor for stopping rotating upon quick stop and the motor status after stop.
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 stat
3: Stop at emergency stop torque, keeping de-energized state
Note: If the brake is enabled, H02.18 is forced to "3: Stop based on ramp 2, keeping de-energized state".

H02.21 **Permissible minimum resistance of braking resistor**

Address:	0x0215	Effective mode:	-
Min.:	1	Unit:	Ω
Max.:	1000	Data Type:	UInt16
Default:	40	Change:	Unchangeable

Value Range:
1Ω to 1000Ω
Description
The permissible minimum resistance of the braking resistor is only related to the servo drive model.

H02.22 **Power of built-in braking resistor**

Address:	0x0216	Effective mode:	-
Min.:	0	Unit:	W
Max.:	65535	Data Type:	UInt16
Default:	50	Change:	Unchangeable

Value Range:
0W–65535W
Description
The power of the built-in braking resistor is only related to the servo drive model, which is unmodifiable.

H02.23 **Resistance of built-in braking resistor**

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

Value Range:
0Ω to 65535Ω

Description

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

H02.24 Resistor heat dissipation coefficient

Address:	0x0218	Effective mode:	Real-time
Min.:	10	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	30	Change:	Real-time

Value Range:

10% to 100%

Description

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

Defines the heat dissipation coefficient of the braking resistor, which is applicable to both external and built-in braking 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 Braking resistor type

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

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.

0: Built-in

1: External, natural cooling

2: External, forced air cooling

3: No resistor needed

H02.26 Power of external braking resistor

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

Value Range:

1 W–65535 W

Description

Defines the power of external braking resistor.

H02.27 Resistance of external braking resistor

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

Value Range:

15Ω to 1000Ω

Description

Defines the resistance of the external braking resistor.

H02.30 User password

Address:	0x021E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

You can only set the user password through the keypad.

H02.31 System parameter initialization

Address:	0x021F	Effective mode:	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.
0: No operation
1: Restore default settings
2: Clear fault records

H02.32 **Selection of parameters in group H0b**

Address:	0x0220	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	50	Change:	Real-time

Value Range:

0 to 99

Description

Sets the offset of H0b parameters 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.

H02.33 **200P software version**

Address:	0x0221	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Displays 200P version number.

H02.35 **Keypad data update frequency**

Address:	0x0223	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	20	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 Hz–20 Hz

Description

Set the keypad data update frequency.

H02.38 Overload time of external resistor

Address:	0x0226	Effective mode:	Upon the next power-on
Min.:	0	Unit:	s
Max.:	200	Data Type:	UInt16
Default:	40	Change:	Real-time

Value Range:

0s to 200s

Description

Set the overload time threshold of the external braking resistor.

H02.41 Manufacturer password

Address:	0x0229	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 65535

Description

You need to input this manufacturer password to enable the access to protected manufacturer parameters.

H02.43 Dynamic braking resistor power

Address:	0x022B	Effective mode:	-
Min.:	0.0	Unit:	W
Max.:	6553.5	Data Type:	UInt16
Default:	20.0	Change:	Unchangeable

Value Range:

0.0 W–6553.5 W

Description

Read the power of the dynamic braking resistor.

H02.44 Dynamic braking resistor resistance

Address:	0x022C	Effective mode:	-
Min.:	0.0	Unit:	Ω

Max.:	1000.0	Data Type:	UInt16
Default:	3.6	Change:	Unchangeable

Value Range:

0.0Ω to 1000.0Ω

Description

Read the resistance of the dynamic braking resistor.

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

Address:	0x022F	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	10	Change:	Real-time

Value Range:

0 ms–1000 ms

Description

It is the same as H02.12. In case of power line breakage, this parameter is used instead of H02.12 to avoid the vertical axis falling.

H02.48 **Thermal capacity percentage of the dynamic braking resistor**

Address:	0x0230	Effective mode:	Real-time
Min.:	90.0	Unit:	%
Max.:	110.0	Data Type:	UInt16
Default:	100.0	Change:	Real-time

Value Range:

90.0% to 110.0%

Description

Defines the overload protection gain of the dynamic braking resistor.

8.4 H03 Terminal Input Parameters

H03.02 **DI1 function**

Address:	0x0302	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	14	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
38: Probe 1
39: Probe 2
56: External switch of the EEPOS program block

Description

Defines the function of DI1.

H03.03 **DI1 logic selection**

Address:	0x0303	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

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**

Address:	0x0304	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	15	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
38: Probe 1
39: Probe 2
56: External switch of the EEPOS program block

Description

Defines the function of DI2.

H03.05 **DI2 logic selection**

Address:	0x0305	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Normally open
1: Closed

Description

Set the DI2 logic when the DI function allocated to DI2 is enabled.

H03.06 **DI3 function**

Address:	0x0306	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	31	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
38: Probe 1
39: Probe 2
56: External switch of the EEPOS program block

Description

Defines the function of DI3.

H03.07 **DI3 logic selection**

Address:	0x0307	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Normally open
1: Closed

Description

Set the DI3 logic when the DI function allocated to DI3 is enabled.

H03.08 **DI4 function**

Address:	0x0308	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	34	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
38: Probe 1
39: Probe 2
56: External switch of the EEPOS program block

Description

Defines the function of DI4.

H03.09 DI4 logic selection

Address:	0x0309	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Normally open
1: Closed

Description

Set the DI4 logic when the DI function allocated to DI4 is enabled.

H03.10 DI5 function

Address:	0x030A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	38	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
38: Probe 1
39: Probe 2
56: External switch of the EEPOS program block

Description

Defines the function of DI5.

H03.11 DI5 logic selection

Address:	0x030B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Normally open
1: Closed

Description

Set the DI5 logic when the DI function allocated to DI5 is enabled.

H03.50 Voltage-type AI1 offset

Address:	0x0332	Effective mode:	Real-time
Min.:	-5000	Unit:	mV
Max.:	5000	Data Type:	Int16
Default:	0	Change:	Real-time

Value Range:

-5000 mV to 5000 mV

Description

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

H03.51 Voltage-type AI1 input filter time constant

Address:	0x0333	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	2.00	Change:	Real-time

Value Range:

0.00 ms–655.35 ms

Description

It sets the filter time constant of voltage signal input from AI1.

Set this parameter properly to avoid motor reference fluctuation caused by unstable analog voltage input and reduce motor misoperation caused by interference signals.

The filter function cannot eliminate or suppress zero drift or dead zone.

H03.53 Voltage-type AI1 dead zone

Address:	0x0335	Effective mode:	Real-time
Min.:	0.0	Unit:	mV
Max.:	1000.0	Data Type:	UInt16
Default:	10.0	Change:	Real-time

Value Range:

0.0 mV to 1000.0 mV

Description

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

H03.54 Voltage-type AI1 zero drift

Address:	0x0336	Effective mode:	Real-time
Min.:	-500.0	Unit:	mV
Max.:	500.0	Data Type:	Int16
Default:	0.0	Change:	Real-time

Value Range:

-500.0 mV–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.

H03.55 **Voltage-type AI2 offset**

Address:	0x0337	Effective mode:	Real-time
Min.:	-5000	Unit:	mV
Max.:	5000	Data Type:	Int16
Default:	0	Change:	Real-time

Value Range:

-5000 mV to 5000 mV

Description

Defines the actual AI2 input voltage when the drive sampling voltage is 0 after zero drift correction.

H03.56 **Voltage-type AI2 input filter time constant**

Address:	0x0338	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	2.00	Change:	Real-time

Value Range:

0.00 ms–655.35 ms

Description

It sets the filter time constant of voltage signal input from AI2.

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.

H03.58 **Voltage-type AI2 dead zone**

Address:	0x033A	Effective mode:	Real-time
Min.:	0.0	Unit:	mV
Max.:	1000.0	Data Type:	UInt16
Default:	10.0	Change:	Real-time

Value Range:

0.0 mV to 1000.0 mV

Description

Defines the AI2 input voltage range when the drive sampling voltage is 0.

H03.59 **Voltage-type AI2 zero drift**

Address:	0x033B	Effective mode:	Real-time

Min.:	-500.0	Unit:	mV
Max.:	500.0	Data Type:	Int16
Default:	0.0	Change:	Real-time

Value Range:

-500.0 mV–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 2 (AI2 adjustment) to perform automatic adjustment on AI2 zero drift. The AI1 zero drift after adjustment will be saved into H03.59.

H03.60 **DI1 filter time**

Address:	0x033C	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Real-time

Value Range:

0.00 ms–500.00 ms

Description

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

H03.61 **DI2 filter time**

Address:	0x033D	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Real-time

Value Range:

0.00 ms–500.00 ms

Description

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

H03.62 **DI3 filter time**

Address:	0x033E	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Real-time

Value Range:

0.00 ms–500.00 ms

Description

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

H03.63 DI4 filter time

Address:	0x033F	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Real-time

Value Range:

0.00 ms–500.00 ms

Description

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

H03.64 DI5 filter time

Address:	0x0340	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	500.00	Data Type:	UInt16
Default:	3.00	Change:	Real-time

Value Range:

0.00 ms–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.

H03.80 Speed corresponding to analog 10 V

Address:	0x0350	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	At stop

Value Range:

0[mm/s]/[rpm]–10000[mm/s]/[rpm]

Description

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

Speed value = Sampling voltage/10 x H03.80

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

Address:	0x0351	Effective mode:	Real-time
Min.:	0.00	Unit:	Multiplier
Max.:	8.00	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.00 to 8.00

Description

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

Torque value = Sampling voltage/10 × H03.81

8.5 H04 Terminal Output Parameters

H04.00 **DO1 function**

Address:	0x0400	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
25: Comparison output DO
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

Defines the function of DO1.

H04.01 **DO1 logic selection**

Address:	0x0401	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Normally open

1: Closed

Description

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

H04.02 **DO2 function**

Address:	0x0402	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	11	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

25: Comparison output DO

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

Defines the function of DO2.

H04.03 **DO2 logic selection**

Address:	0x0403	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Normally open

1: Closed

Description

Defines the level logic of DO2 when the function assigned to DO2 is active.

H04.22 **DO source selection**

Address:	0x0416	Effective mode:	Real-time

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

Value Range:

Bit0: DO1 output source

0: DO1 function output

1: Bit0 of H31.04

Bit1: DO2 output source

0: DO2 function output

1: Bit1 of H31.04

Description

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

H04.24 **DO brake enable**

Address:	0x0418	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

0: You can only control the motor brake through the built-in brake terminal even if the DO brake function is available.

1: The DO brake function must be available.

Note: This function is not available for functional safety models.

H04.50 **AO1 signal selection**

Address:	0x0432	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Motor speed (1 V/1000 [mm/s]/[rpm])
1: Speed reference (1 V/1000 [mm/s]/[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 [mm/s]/[rpm])
6: Positioning completed
8: AI1 voltage
9: AI2 voltage
10: Defined by H31.05

Description

Defines the physical value source of AO1.

H04.51 AO1 offset voltage

Address:	0x0433	Effective mode:	Real-time
Min.:	-10000	Unit:	mV
Max.:	10000	Data Type:	Int16
Default:	0	Change:	Real-time

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 ratio

Address:	0x0434	Effective mode:	Real-time
Min.:	-99.99	Unit:	-
Max.:	99.99	Data Type:	Int16
Default:	1.00	Change:	Real-time

Value Range:

-99.99 to 99.99

Description

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

8.6 H05 Position Control Parameters

H05.02 **Pulses per revolution**

Address:	0x0502	Effective mode:	Upon the next power-on
Min.:	0	Unit:	PPR
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	At stop

Value Range:

0 PPR to 4294967295 PPR

Description

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

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

Address:	0x0504	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 ms–6553.5 ms

Description

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

H05.06 **Moving average filter time constant 1**

Address:	0x0506	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	128.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 ms–128.0 ms

Description

Defines the moving average filter time constant of position references.

H05.07 **Electronic gear ratio 1 (numerator)**

Address:	0x0507	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	67108864	Change:	Real-time

Value Range:
1 to 1073741824
Description
Defines the numerator of electronic gear ratio 1. This parameter is recommended to be changed during disabling.

H05.09 Electronic gear ratio 1 (denominator)

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

Value Range:
1 to 1073741824
Description
Defines the denominator of electronic gear ratio 1. This parameter is recommended to be changed during disabling.

H05.11 Electronic gear ratio 2 (numerator)

Address:	0x050B	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	1073741824	Data Type:	UInt32
Default:	67108864	Change:	Real-time

Value Range:
1 to 1073741824
Description
Defines the numerator of electronic gear ratio 2. This parameter is recommended to be changed during disabling.

H05.13 Electronic gear ratio 2 (denominator)

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

Value Range:
1 to 1073741824
Description
Defines the denominator of electronic gear ratio 2. This parameter is recommended to be changed during disabling.

H05.16 **Clear action**

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

Value Range:

0: Clear the position deviation upon S-ON OFF or a fault

2: Clear the position deviation when the drive is in the non-RUN state or function DI35 is active.

Description

Defines the condition for clearing the position deviation.

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

Address:	0x0511	Effective mode:	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**

Address:	0x0513	Effective mode:	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

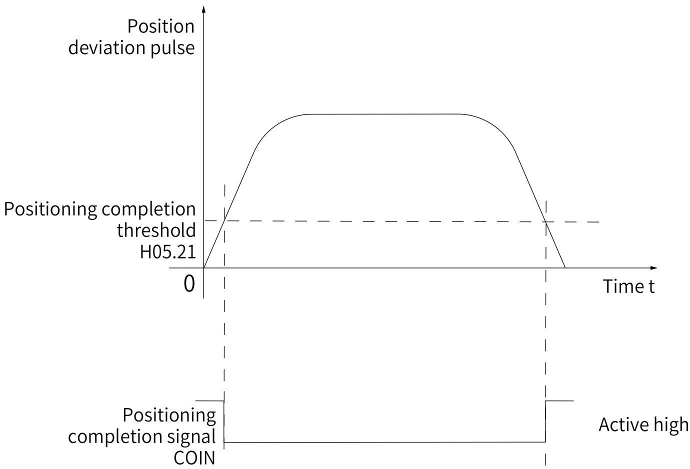
Defines the source of the speed loop feedforward signal.
0: No speed feedforward
1: Internal speed feedforward
2: H05.72

3: Zero phase
Note: If you select external speed feedforward, you must set the feedforward source through H05.72.

H05.21 **Positioning completed threshold**

Address:	0x0515	Effective mode:	Real-time
Min.:	1	Unit:	encoder unit
Max.:	65535	Data Type:	UInt16
Default:	46976	Change:	Real-time

Value Range:
1 to 65535
Description
Defines the threshold of the absolute value of position deviation when the drive outputs the positioning completed signal.
Positioning completed signal: DO function 5 (FunOUT.5: COIN).



Note: The parameter takes effect when H02.00 is not 9.

H05.30 **Homing enable selection**

Address:	0x051E	Effective mode:	Real-time

Min.:	0	Unit:	-
Max.:	6	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disabled

6: Current position as home

Description

Defines the homing mode and the trigger signal source.

When H05.30 = 6, position feedback is the setpoint of H05.36 regardless of the value of H05.40.

H05.35 **Home search time limit**

Address:	0x0523	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	10000	Change:	Real-time

Value Range:

0 to 65535

Description

Defines the maximum home searching time. The time unit is defined by H05.66.

H05.36 **Mechanical home offset**

Address:	0x0524	Effective mode:	Real-time
Min.:	-2147483648	Unit:	reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

Defines the absolute position of the motor after homing.

H05.38 **Frequency-division output source**

Address:	0x0526	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Encoder frequency-division 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.
0: Encoder frequency-division output
2: Frequency-division output inhibited
3: Second encoder frequency-division output
4: H31.01 reference frequency output

H05.39 Electronic gear ratio switchover condition

Address:	0x0527	Effective mode:	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. After the fully closed-loop function is enabled and H0F.00 is set to 2, the setpoint is forcibly set to 0.
When its value is 0: when H0F.00 = 2, the switching condition is that the position command is 0 and positioning is completed and lasts for 2.5 ms; when H0F.00 is not 2, the switching condition is that the position command keeps at 0 for 2.5 ms.

H05.40 Mechanical home offset and action upon overtravel

Address:	0x0528	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Mechanical home offset (H05.36) is the coordinate after homing
1: Mechanical home offset (H05.36) is the relative offset after homing

Description

Defines the offset relationship between the mechanical home and mechanical zero point, and the action upon overtravel during homing.
0: Mechanical home offset (H05.36) is the coordinate after homing
1: Mechanical home offset (H05.36) is the relative offset after homing

H05.41 Z pulse output polarity

Address:	0x0529	Effective mode:	Upon the next power-on
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x1	Change:	At stop

Value Range:
bit0: Frequency-division Z output polarity
0: Positive (high level upon active Z pulse)
1: Negative (low level upon active Z pulse)
bit1: OCZ 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

Description
Defines the output level when the Z pulse of pulse output terminal is active.
bit0: Frequency division Z output polarity
0: Positive (high level upon valid Z pulse)
1: Negative (low level upon valid Z pulse)
bit1: OCZ output polarity
0: Positive (high level upon valid Z pulse)
1: Negative (low level upon valid Z pulse)
bit2: Inner loop probe Z signal source
0: Motor Z signal
1: Frequency-division output Z signal

H05.44 Numerator of frequency-division output reduction ratio

Address:	0x052C	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	16383	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:
1 to 16383

Description

Defines the numerator of frequency-division output reduction ratio.

H05.45 Denominator of frequency-division output reduction ratio

Address:	0x052D	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	8191	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 8191

Description

Defines the denominator of frequency-division output reduction ratio.

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

Address:	0x052E	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No operation
1: DI1
2: DI2
3: DI3
4: DI4
5: DI5

Description

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

0: No operation
1: DI1
2: DI2
3: DI3
4: DI4
5: DI5

H05.47 Frequency-division Z pulse width

Address:	0x052F	Effective mode:	Real-time
Min.:	0	Unit:	μs

Max.:	400	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0μs to 400μs

Description

Defines the minimum output width (μs) of frequency-division output PZ. When the pulse signal is used as master encoder and fully closed-loop encoder, the setpoint 0 indicates the original Z signal will be outputted. Other setpoints indicate the frequency-division Z signal will be output.

H05.48 Frequency-division output dead zone setting threshold

Address:	0x0530	Effective mode:	Real-time
Min.:	0	Unit:	encoder unit
Max.:	255	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 255

Description

Defines the dead zone threshold of frequency-division output to prevent frequency-division output caused by encoder jitter.

Note: After this function is enabled, during uniform low-speed operation, intermittent frequency-division pulse output may occur. Set this parameter with caution.

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

Address:	0x0532	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 65535

Description

Defines the numerator of the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

H05.51 Mechanical gear ratio in absolute position rotation mode (denominator)

Address:	0x0533	Effective mode:	Real-time
Min.:	1	Unit:	-

Max.:	65535	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 65535

Description

Defines the denominator of the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

H05.52 Pulses per revolution of the load in absolute position rotation mode (low 32 bits)

Address:	0x0534	Effective mode:	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 (low 32 bits).

H05.54 Pulses per revolution of the load in absolute position rotation mode (high 32 bits)

Address:	0x0536	Effective mode:	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 (high 32 bits).

H05.58 Torque threshold in homing upon hit-and-stop

Address:	0x053A	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	100.0	Change:	Real-time

Value Range:

0.0% to 400.0%

Description

Defines the maximum positive/negative torque limit in homing upon hit-and-stop.

H05.66 Homing time unit

Address:	0x0542	Effective mode:	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

Select the unit of homing time.

0: 1ms

1: 10ms

2: 100ms

Note: The actual timeout is H05.35xH05.66ms

H05.70 Moving average filter time constant 2

Address:	0x0546	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	1000.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 ms–1000.0 ms

Description

-

H05.71 Motor Z signal width

Address:	0x0547	Effective mode:	Real-time
Min.:	1	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	4	Change:	Real-time

Value Range:

1 ms–100 ms

Description

Output pulse width when motor Z signal is active.

H05.72 External speed feedforward source selection

Address:	0x0548	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: AI1

2: AI2

Description

External speed feedforward source selection

0: No definition

1: AI1

2: AI2

H05.74 S-curve mode selection

Address:	0x054A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	6	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: 1 filter on

1: 2 filters on, filter time 5:1

2: 2 filters on, filter time 2:1

3: 2 filters on, filter time 1:1

4: 3 filters on, filter time 4:1:1

5: 3 filters on, filter time 2:1:1

6: 3 filters on, filter time 1:1:1

Description

S-curve mode selection

0: 1 filter

1: 2 filters, filter time 5:1

2: 2 filters, filter time 2:1

3: 2 filters, filter time 1:1

4: 3 filters, filter time 4:1:1

5: 3 filters, filter time 2:1:1

6: 3 filters, filter time 1:1:1

8.7 H06 Speed Control Parameters

H06.04 **DI jog speed reference**

Address:	0x0604	Effective mode:	Real-time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	150	Change:	Real-time

Value Range:

0 rpm to 10000 rpm

Description

Defines the DI jog speed reference.

H06.05 **Acc. ramp time of speed reference**

Address:	0x0605	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–65535 ms

Description

Sets acceleration ramp time of speed reference.

H06.05 defines the time for the speed reference to change from 0 rpm to 1000 rpm.

The formulas for calculating the actual acceleration and deceleration time are as follows:

Actual acceleration time t = Speed reference ÷ 1000 x Acceleration ramp time of speed reference

H06.06 **Dec. ramp time of speed reference**

Address:	0x0606	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–65535 ms

Description

Sets deceleration ramp time of speed reference.

H06.06 defines the time for the speed reference to change from 1000 rpm to 0 rpm.

The formulas for calculating the actual acceleration and deceleration time are as follows:
Actual deceleration time t = Speed reference ÷ 1000 x Deceleration ramp time of speed reference

H06.07 **Maximum speed limit**

Address:	0x0607	Effective mode:	Real-time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Real-time

Value Range:

0 rpm to 10000 rpm

Description

Defines the maximum speed limit.

H06.08 **Forward speed threshold**

Address:	0x0608	Effective mode:	Real-time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Real-time

Value Range:

0 rpm to 10000 rpm

Description

Defines the forward speed threshold.

H06.09 **Reverse speed threshold**

Address:	0x0609	Effective mode:	Real-time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	7000	Change:	Real-time

Value Range:

0 rpm to 10000 rpm

Description

Defines the reverse speed threshold.

H06.10 **Deceleration unit in emergency stop**

Address:	0x060A	Effective mode:	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.

0: Multiplied by 1

1: Multiplied by 10

2: Multiplied by 100

H06.11 Torque feedforward control

Address:	0x060B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

0: No torque feedforward

1: Internal torque feedforward

Description

Defines the source for torque feedforward control.

0: No torque feedforward

1: Internal torque feedforward

H06.12 Acceleration ramp time of jog speed

Address:	0x060C	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	10	Change:	Real-time

Value Range:

0 ms–65535 ms

Description

Sets the acceleration ramp time of jog speed.

Indicates the time for the speed reference to accelerate from 0 to 1000 rpm or the time for the speed reference to decelerate from 1000 rpm to 0.

The formulas for calculating the actual acceleration and deceleration time are as follows:

Actual acc./dec. time t = Speed reference ÷ 1000 x Acceleration ramp time of speed reference

H06.13 Speed feedforward smoothing filter

Address:	0x060D	Effective mode:	Real-time
Min.:	0	Unit:	μs
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0μs to 65535μs

Description

Defines the speed feedforward smoothing filter time.

H06.15 Zero clamp speed threshold

Address:	0x060F	Effective mode:	Real-time
Min.:	0	Unit:	rpm
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Real-time

Value Range:

0 rpm to 10000 rpm

Description

Defines the zero clamp speed threshold.

H06.16 Threshold of TGON (motor rotation) signal

Address:	0x0610	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]
Max.:	1000	Data Type:	UInt16
Default:	20	Change:	Real-time

Value Range:

0[mm/s]/[rpm]–1000[mm/s]/[rpm]

Description

Sets the threshold of TGON (motor rotation) signal.

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

Address:	0x0611	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]

Max.:	100	Data Type:	UInt16
Default:	10	Change:	Real-time

Value Range:

0[mm/s]/[rpm]–100[mm/s]/[rpm]

Description

Defines the threshold of speed match signal.

H06.18 Threshold of speed reach signal

Address:	0x0612	Effective mode:	Real-time
Min.:	20	Unit:	[mm/s]/[rpm]
Max.:	10000	Data Type:	UInt16
Default:	1000	Change:	Real-time

Value Range:

20[mm/s]/[rpm]–10000[mm/s]/[rpm]

Description

Defines the threshold of speed reached signal.

H06.19 Threshold of zero speed output signal

Address:	0x0613	Effective mode:	Real-time
Min.:	1	Unit:	[mm/s]/[rpm]
Max.:	10000	Data Type:	UInt16
Default:	10	Change:	Real-time

Value Range:

1[mm/s]/[rpm]–10000[mm/s]/[rpm]

Description

Defines the threshold of zero speed output signal.

H06.28 Cogging torque ripple compensation

Address:	0x061C	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Used to enable the cogging torque fluctuation compensation function.

0: Disabled

1: Enabled

H06.40 Ramp 1 deceleration time

Address:	0x0628	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–65535 ms

Description

Defines the deceleration time of ramp 1. The time from the rated speed to 0 rpm can be obtained through H06.40 x H06.42 ramp 1/PN ramp stop deceleration time override.

H06.41 Ramp 2 deceleration time

Address:	0x0629	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–65535 ms

Description

Defines the deceleration time of ramp 2. The time from the rated speed to 0 rpm can be obtained through H06.40 x H06.43 ramp 2/PN quick stop deceleration time override.

H06.42 Deceleration time override of ramp 1/PN ramp stop

Address:	0x062A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: 1 x 1 time unit

1: 10 x time unit

Description

Defines the override of H06.40 ramp 1 deceleration time.

H06.43 Ramp 2/PN quick stop deceleration time ratio

Address:	0x062B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: 1 x 1 time unit

1: 10 x time unit

Description

Defines the override of H06.41 ramp 2 deceleration time.

8.8 H07 Torque Control Parameters

H07.05 Torque reference filter time constant 1

Address:	0x0705	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	30.00	Data Type:	UInt16
Default:	0.50	Change:	Real-time

Value Range:

0.00 ms–30.00 ms

Description

Defines the torque reference filter time constant 1.

H07.06 Torque reference filter time constant 2

Address:	0x0706	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	30.00	Data Type:	UInt16
Default:	0.27	Change:	Real-time

Value Range:

0.00 ms–30.00 ms

Description

Defines the torque reference filter time constant 2.

H07.07 Torque Limit source

Address:	0x0707	Effective mode:	Real-time
Min.:	0	Unit:	-

Max.:	5	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Positive/Negative internal torque limit

2: T_LMT limit

5: PN torque limit

Description

Defines the torque reference source of torque limit source.

0: Positive/Negative internal torque limit

2: T_LMT limit

5: PN torque limit

H07.08 T-LMT selection

Address:	0x0708	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: AI1

2: AI2

Description

Sets the AI as the torque limit source.

1: AI1

2: AI2

H07.09 Positive internal torque limit

Address:	0x0709	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	350.0	Change:	Real-time

Value Range:

0.0% to 400.0%

Description

Sets the forward run internal torque limit.

H07.10 Negative internal torque limit

Address:	0x070A	Effective mode:	Real-time
Min.:	0.0	Unit:	%

Max.:	400.0	Data Type:	UInt16
Default:	350.0	Change:	Real-time

Value Range:

0.0% to 400.0%

Description

Sets the reverse run internal torque limit.

H07.15 Emergency-stop torque

Address:	0x070F	Effective mode:	At stop
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	100.0	Change:	Real-time

Value Range:

0.0% to 400.0%

Description

Set the torque for emergency stop.

H07.17 Speed limit source

Address:	0x0711	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Internal speed limit

1: V-LMT

Description

Defines the speed reference source of speed limit source.

0: Internal speed limit

1: V-LMT

H07.18 V-LMT selection

Address:	0x0712	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: AI1

2: AI2

Description

Sets the AI as the speed limit source.
1: AI1
2: AI2

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

Address:	0x0713	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	Real-time

Value Range:
0[mm/s]/[rpm]–10000[mm/s]/[rpm]
Description
Set the positive speed limit/Speed limit 1 in torque control.

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

Address:	0x0714	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]
Max.:	10000	Data Type:	UInt16
Default:	3000	Change:	Real-time

Value Range:
0[mm/s]/[rpm]–10000[mm/s]/[rpm]
Description
Set the negative speed limit/Speed limit 2 in torque control.

H07.24 **Field weakening depth**

Address:	0x0718	Effective mode:	Real-time
Min.:	60	Unit:	%
Max.:	115	Data Type:	UInt16
Default:	115	Change:	Real-time

Value Range:
60% to 115%
Description
Set the flux weakening depth.

H07.25 **Max. permissible demagnetizing current**

Address:	0x0719	Effective mode:	Real-time
Min.:	0	Unit:	%

Max.:	300	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:

0% to 300%

Description

Set the maximum allowable demagnetization current value.

H07.26 Field weakening selection

Address:	0x071A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Enable/disable field weakening.

0: Disabled

1: Enabled

H07.27 Flux weakening gain

Address:	0x071B	Effective mode:	Real-time
Min.:	0.001	Unit:	kHz
Max.:	1.000	Data Type:	UInt16
Default:	0.030	Change:	Real-time

Value Range:

0.001 kHz–1.000 kHz

Description

Set the gain of flux weakening.

H07.28 Speed of flux weakening point

Address:	0x071C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Set the speed of flux weakening point.

H07.35 Torque output correction enabled

Address:	0x0723	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 3

Description

Set the torque output correction function.

H07.36 Time constant of low-pass filter 2

Address:	0x0724	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	10.00	Data Type:	UInt16
Default:	0.00	Change:	Real-time

Value Range:

0.00 ms–10.00 ms

Description

Set the time constant of low-pass filter 2.

H07.37 Torque reference filter selection

Address:	0x0725	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: First-order filter

1: Biquad filter

Description

Select the torque reference filter.

0: First-order filter1: Biquad filter

When second-order filter is selected, the filter structure is biquad filter for ROT motors, and the filter parameters are set through H07.38. For DDR/DDL motors, the filter structure is biquad low-pass filter, and the filter parameters are set through H07.42.

H07.38 **Biquad filter attenuation ratio**

Address:	0x0726	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	50	Data Type:	UInt16
Default:	16	Change:	Real-time

Value Range:

0 to 50

Description

Defines the attenuation ratio of biquad filter.

H07.40 **Speed limit threshold in torque control mode**

Address:	0x0728	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	300	Data Type:	UInt16
Default:	10	Change:	Real-time

Value Range:

0 ms–300 ms

Description

Sets speed limit time window in the torque control mode.

H07.42 **Biquad low pass filter damping coefficient**

Address:	0x072A	Effective mode:	Real-time
Min.:	0.001	Unit:	-
Max.:	10.000	Data Type:	UInt16
Default:	1.000	Change:	Real-time

Value Range:

0.001 to 10.000

Description

Defines the damping coefficient of biquad low-pass filter.

8.9 H08 Gain Parameters

H08.00 **Speed loop gain**

Address:	0x0800	Effective mode:	Real-time
Min.:	0.0	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	40.0	Change:	Real-time

Value Range:

0.0 Hz–2000.0 Hz

Description

Defines the responsiveness of the speed loop. The higher the setpoint, the faster the speed loop response is. Note that an excessively high setpoint may cause vibration.

In the position control mode, the position loop gain must be increased together with the speed loop gain.

H08.01 **Speed loop integral time constant**

Address:	0x0801	Effective mode:	Real-time
Min.:	0.15	Unit:	ms
Max.:	512.00	Data Type:	UInt16
Default:	19.89	Change:	Real-time

Value Range:

0.15 ms–512.00 ms

Description

Defines the integral time constant of the speed loop.

The lower the setpoint, the better the integral action, and the quicker will the deviation value be close to 0.

Note:

There is no integral action when H08.01 is set to 512.00.

H08.02 **Position loop gain**

Address:	0x0802	Effective mode:	Real-time
Min.:	0.0	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	64.0	Change:	Real-time

Value Range:

0.0 Hz–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 1 of torque reference).

H08.03 2nd speed loop gain

Address:	0x0803	Effective mode:	Real-time
Min.:	0.1	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	75.0	Change:	Real-time

Value Range:

0.1 Hz–2000.0 Hz

Description

Set 2nd speed loop gain.

H08.04 2nd speed loop integral time constant

Address:	0x0804	Effective mode:	Real-time
Min.:	0.15	Unit:	ms
Max.:	512.00	Data Type:	UInt16
Default:	10.61	Change:	Real-time

Value Range:

0.15 ms–512.00 ms

Description

Set the 2nd speed loop integral time constant.

H08.05 2nd position loop gain

Address:	0x0805	Effective mode:	Real-time
Min.:	0.1	Unit:	Hz
Max.:	2000.0	Data Type:	UInt16
Default:	120.0	Change:	Real-time

Value Range:

0.1 Hz–2000.0 Hz

Description

Defines the second gain set of the position loop and speed loop. The 2nd group of gain parameters include H08.03 (Speed loop gain), H08.04 (Speed loop integral time constant), H08.05, and H07.06 (Torque reference filter time constant 2).

H08.08 2nd gain mode setting

Address:	0x0808	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16

Default:	1	Change:	Real-time

Value Range:

0: Fixed to the 1st group of gains, P/PI switched through external

DI1:Switched between the 1st and 2nd group of gains as defined by H08.09

Description

Defines the mode for switching to the 2nd gain set.

0: Fixed to the 1st group of gains, P/PI switched through external

DI1:Switched between the 1st and 2nd group of gains as defined by H08.09

H08.09 Gain switchover condition

Address:	0x0809	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Fixed to the 1st gain set (PS)
1: Switched as defined by Func3 of DI
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.

0: Fixed to the 1st gain set (PS)
1: Switched as defined by Func3 of DI
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)

H08.10 Gain switchover delay

Address:	0x080A	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	1000.0	Data Type:	UInt16
Default:	5.0	Change:	Real-time

Value Range:

0.0 ms–1000.0 ms

Description

Defines the delay when the drive switches from the 2nd gain set to the 1st gain set.

H08.11 Gain switchover level

Address:	0x080B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20000	Data Type:	UInt16
Default:	50	Change:	Real-time

Value Range:

0 to 20000

Description

Defines the gain switchover level.

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

H08.12 Gain switchover hysteresis

Address:	0x080C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20000	Data Type:	UInt16
Default:	30	Change:	Real-time

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

Address:	0x080D	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	1000.0	Data Type:	UInt16
Default:	3.0	Change:	Real-time

Value Range:

0.0 ms–1000.0 ms

Description

In position control, if H08.05 (2nd position loop gain) is much higher than H08.02 (Position loop gain), set the time for switching from H08.02 to H08.05. This parameter can be used to reduce the impact caused by an increase in the position loop gain.

H08.15 Load moment of inertia ratio

Address:	0x080F	Effective mode:	Real-time
Min.:	0.00	Unit:	-
Max.:	120.00	Data Type:	UInt16
Default:	1.00	Change:	Real-time

Value Range:

0.00 to 120.00

Description

Defines the mechanical load inertia ratio relative to the motor moment of inertia.

When H08.15 is set to 0, it indicates the motor carries no load; if it is set to 1.00, it indicates the mechanical load inertia is the same as the motor moment of inertia.

H08.17 Zero phase delay

Address:	0x0811	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	4.0	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0 ms–4.0 ms

Description

Set zero phase delay.

H08.18 **Time constant of speed feedforward filter**

Address:	0x0812	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	64.00	Data Type:	UInt16
Default:	0.50	Change:	Real-time

Value Range:

0.00 ms–64.00 ms

Description

Defines the filter time constant of speed feedforward.

H08.19 **Speed feedforward gain**

Address:	0x0813	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0% to 100.0%

Description

In position control and full closed-loop control, speed feedforward is the product of speed feedforwad signal multiplied by H08.19 and is part of the speed reference.

Increasing the setpoint improves the responsiveness to position references and reduces the position deviation during operation at a constant speed.

Set H08.18 to a fixed value first, and then increase the value of H08.19 gradually from 0 to a certain value at which speed feedforward achieves the desired effect.

Adjust H08.18 and H08.19 repeatedly until a balanced performance is achieved.

Note:

For how to enable the speed feedforward function and select the speed feedforward signal, see H05.19 (Speed feedforward control).

H08.20 **Torque feedforward filter time constant**

Address:	0x0814	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	64.00	Data Type:	UInt16
Default:	0.50	Change:	Real-time

Value Range:

0.00 ms–64.00 ms

Description

Defines the filter time constant of torque feedforward.

H08.21 Torque feedforward gain

Address:	0x0815	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	300.0	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0% to 300.0%

Description

In control modes other than torque control, torque feedforward is the product of torque feedforwad signal multiplied by H08.21 and is part of the torque reference.

Increasing the setpoint improves the responsiveness to variable speed references.

Increasing the setpoint improves the responsiveness to position references and reduces the position deviation during operation at a constant speed.

During parameter adjustment, set H08.20 (Torque feedforward filter time constant) to the default value first, and then increase H08.21 gradually to enhance the effect of torque feedforward. When speed overshoot occurs, keep H08.21 unchanged and increase the value of H08.20. Adjust H08.20 and H08.21 repeatedly until a balanced performance is achieved.

Note:

For how to enable the torque feedforward function and select the torque feedforward signal, see H06.11 (Torque feedforward control).

H08.22 Speed feedback filtering option

Address:	0x0816	Effective mode:	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.
0: Inhibited
1: 2 times

2: 4 times
3: 8 times
4: 16 times
Note: The larger the parameter value, the smaller the speed feedback ripple, but the larger the feedback delay.

H08.23 **Cutoff frequency of speed feedback low-pass filter**

Address:	0x0817	Effective mode:	Real-time
Min.:	100	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:
100 Hz–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 8000 Hz negates the filtering effect.

H08.24 **PDFF control coefficient**

Address:	0x0818	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	200.0	Data Type:	UInt16
Default:	100.0	Change:	Real-time

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.

H08.25 **Speed measurement method**

Address:	0x0819	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: M-method
1: MT-method
Description
Speed measurement method
Activated only when it is set to 1 and a pulse encoder is used.

H08.27 **Speed observer cutoff frequency**

Address:	0x081B	Effective mode:	Real-time
Min.:	50	Unit:	Hz
Max.:	600	Data Type:	UInt16
Default:	170	Change:	Real-time

Value Range:
50 Hz–600 Hz
Description
Defines the cutoff frequency of the speed observer. Note that an excessively high setpoint may incur resonance. Decrease the setpoint properly in case of large speed feedback noise.

H08.28 **Speed observer inertia correction coefficient**

Address:	0x081C	Effective mode:	Real-time
Min.:	1	Unit:	%
Max.:	1600	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:
1% to 1600%

Description

Defines the speed observer inertia correction coefficient. If H08.15 is set based on the actual inertia, there is no need to adjust this parameter.

H08.29 Speed observer filter time

Address:	0x081D	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	10.00	Data Type:	UInt16
Default:	0.80	Change:	Real-time

Value Range:

0.00 ms–10.00 ms

Description

Defines the speed observer filter time. It is recommended to set this parameter to a value equal to the sum of H07.05 plus 0.2 ms.

H08.31 Disturbance cutoff frequency

Address:	0x081F	Effective mode:	Real-time
Min.:	1	Unit:	Hz
Max.:	4000	Data Type:	UInt16
Default:	600	Change:	Real-time

Value Range:

1 Hz–4000 Hz

Description

Defines the cutoff frequency of the disturbance observer. Increasing the setpoint improves the responsiveness of the disturbance observer and the compensation effect. Note that an excessively high setpoint may incur resonance.

H08.32 Disturbance compensation gain

Address:	0x0820	Effective mode:	Real-time
Min.:	0	Unit:	%
Max.:	100	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0% to 100%

Description

Defines the compensation gain of the disturbance observer. The setpoint 100% indicates full compensation.

H08.33 **Disturbance observer inertia correction coefficient**

Address:	0x0821	Effective mode:	Real-time
Min.:	1	Unit:	%
Max.:	1600	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:

1% to 1600%

Description

Defines the disturbance observer inertia correction coefficient. If H08.15 is set based on the actual inertia, there is no need to adjust this parameter.

H08.37 **Phase modulation for medium-frequency jitter suppression 2**

Address:	0x0825	Effective mode:	Real-time
Min.:	-90	Unit:	°
Max.:	90	Data Type:	Int16
Default:	0	Change:	Real-time

Value Range:

-90° to 90°

Description

Defines the compensation phase of medium-frequency jitter suppression 2.

H08.38 **Medium-frequency suppression 2 frequency**

Address:	0x0826	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	1000	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 Hz–1000 Hz

Description

Set this parameter based on actual resonance frequency. The valid suppression frequency range for medium-frequency jitter suppression 2 is 100 Hz to 1000 Hz.

H08.39 **Compensation gain of medium-frequency jitter suppression 2**

Address:	0x0827	Effective mode:	Real-time
Min.:	0	Unit:	%
Max.:	300	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0% to 300%

Description

Defines the compensation gain for medium-frequency jitter suppression 2. Set this parameter to 40%...55% in general cases. Setting this parameter to 0 negates the effect of medium-frequency jitter suppression 2.

H08.40 Speed observer selection

Address:	0x0828	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disabled

1: Enabled

Description

Used to set the enable bit for speed observer.

0: Disabled

1: Enabled

H08.42 Model control selection

Address:	0x082A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disabled

1: Enabled

2: Reserved

Description

Used to enable model tracking control.

0: Disabled

1: Enabled

2: Reserved

H08.43 Model gain

Address:	0x082B	Effective mode:	Real-time
Min.:	0.1	Unit:	-
Max.:	2000.0	Data Type:	UInt16

Default:	40.0	Change:	Real-time

Value Range:

0.1 to 2000.0

Description

Defines the single inertia model gain. The higher the gain, the faster the position response. Note that an excessively high setpoint may incur excessive overshoot.

H08.46 Feedforward value

Address:	0x082E	Effective mode:	Real-time
Min.:	0.0	Unit:	-
Max.:	102.4	Data Type:	UInt16
Default:	95.0	Change:	Real-time

Value Range:

0.0 to 102.4

Description

Defines the speed feedforward gain for single inertia model control. If overshoot occurs, reduce the setpoint properly.

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

Address:	0x0835	Effective mode:	Real-time
Min.:	0.0	Unit:	Hz
Max.:	300.0	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0 Hz–300.0 Hz

Description

Set this parameter based on actual resonance frequency. The resonance suppression range is 100 Hz to 300 Hz.

H08.54 Medium- and low-frequency jitter suppression compensation 3

Address:	0x0836	Effective mode:	Real-time
Min.:	0	Unit:	%
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0% to 200%

Description

Defines the compensation gain for medium- and low-frequency suppression compensation 3. The setpoint 200% indicates full compensation.

H08.56 **Medium- and low-frequency jitter suppression phase modulation 3**

Address:	0x0838	Effective mode:	Real-time
Min.:	0	Unit:	%
Max.:	600	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:

0% to 600%

Description

Adjust this parameter based on the actual compensation effect.

H08.59 **Medium- and low-frequency jitter suppression frequency 4**

Address:	0x083B	Effective mode:	Real-time
Min.:	0.0	Unit:	Hz
Max.:	300.0	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0 Hz–300.0 Hz

Description

Set this parameter based on actual resonance frequency. The resonance suppression range is 100 Hz to 300 Hz.

H08.60 **Medium- and low-frequency jitter suppression compensation 4**

Address:	0x083C	Effective mode:	Real-time
Min.:	0	Unit:	%
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0% to 200%

Description

Defines the compensation gain for medium- and low-frequency suppression compensation 4. The setpoint 200% indicates full compensation.

H08.61 **Medium- and low-frequency jitter suppression phase modulation 4**

Address:	0x083D	Effective mode:	Real-time
Min.:	0	Unit:	%
Max.:	600	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:

0% to 600%

Description

Adjust this parameter based on the actual compensation effect.

H08.62 **Position loop integral time constant**

Address:	0x083E	Effective mode:	Real-time
Min.:	0.15	Unit:	-
Max.:	512.00	Data Type:	UInt16
Default:	512.00	Change:	Real-time

Value Range:

0.15 to 512.00

Description

Defines the position loop integral time constant.

H08.63 **2nd position loop integral time constant**

Address:	0x083F	Effective mode:	Real-time
Min.:	0.15	Unit:	-
Max.:	512.00	Data Type:	UInt16
Default:	512.00	Change:	Real-time

Value Range:

0.15 to 512.00

Description

Defines the 2nd position loop integral time constant.

H08.64 **Speed observer feedback source**

Address:	0x0840	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Observer output speed

1: Observer observed speed

Description

Select the speed observer feedback source.

0: Observer output speed

1: Observer observed speed

H08.65 Zero deviation control selection

Address:	0x0841	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disabled

1: Enabled

Description

Used to enable/disable zero deviation control.

0: Disabled

1: Enabled

H08.66 Zero deviation control position average filter

Address:	0x0842	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	320.0	Data Type:	UInt16
Default:	5.0	Change:	At stop

Value Range:

0.0 ms–320.0 ms

Description

Defines the average filter time of zero deviation control position. It is recommended to increase the setpoint in case of large noise caused by low command resolution.

H08.68 Speed feedforward of zero deviation control

Address:	0x0844	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	100.0	Change:	Real-time

Value Range:

0.0% to 100.0%

Description

Defines the speed feedforward of zero deviation control.

H08.69 Torque feedforward of zero deviation control

Address:	0x0845	Effective mode:	Real-time
Min.:	0.0	Unit:	%

Max.:	100.0	Data Type:	UInt16
Default:	100.0	Change:	Real-time

Value Range:

0.0% to 100.0%

Description

Defines the torque feedforward of zero deviation control.

8.10 H09 Auto-tuning Parameters

H09.00 Auto-adjustment mode

Address:	0x0900	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	4	Change:	Real-time

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.

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-tuning6: Quick positioning mode+Inertia auto-tuning

H09.01 Stiffness level selection

Address:	0x0901	Effective mode:	Real-time

Min.:	0	Unit:	-
Max.:	41	Data Type:	UInt16
Default:	15	Change:	Real-time

Value Range:

0 to 41

Description

Defines the stiffness level of the servo system. The higher the stiffness level, the stronger the gains and the quicker the response will be. But an excessively high stiffness level will cause vibration.

The setpoint 0 indicates the weakest stiffness and 41 indicates the strongest stiffness.

H09.02 Mode selection of adaptive notch

Address:	0x0902	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	Real-time

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.

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

H09.03 Online inertia auto-tuning mode

Address:	0x0903	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Real-time

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.

0: Disabled
1: Enabled, changing slowly
2: Enabled, changing normally
3: Enabled, changing quickly

H09.05 **Offline inertia auto-tuning mode**

Address:	0x0905	Effective mode:	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.

0: Bi-directional
1: Unidirectional

H09.06 **Max. speed of inertia auto-tuning**

Address:	0x0906	Effective mode:	Real-time
Min.:	100	Unit:	[mm/s]/[rpm]
Max.:	1000	Data Type:	UInt16
Default:	500	Change:	At stop

Value Range:

100[mm/s]/[rpm]–1000[mm/s]/[rpm]

Description

Defines the maximum permissible speed reference in offline inertia auto-tuning mode.

During inertia auto-tuning, the higher the speed, the more accurate the auto-tuned values. Use the default setpoint in general cases.

H09.07 Time constant for accelerating to max. speed during inertia auto-tuning

Address:	0x0907	Effective mode:	Real-time
Min.:	10	Unit:	ms
Max.:	5000	Data Type:	UInt16
Default:	125	Change:	At stop

Value Range:

10 ms–5000 ms

Description

Defines the time for the motor to accelerate from 0 [mm/s]/[rpm] to the maximum speed of inertia auto-tuning (H09.06) during offline inertia auto-tuning.

H09.08 Interval time after an individual inertia auto-tuning

Address:	0x0908	Effective mode:	Real-time
Min.:	50	Unit:	ms
Max.:	10000	Data Type:	UInt16
Default:	800	Change:	At stop

Value Range:

50 ms–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 Motor rotating distance per inertia auto-tuning

Address:	0x0909	Effective mode:	Real-time
Min.:	0.00	Unit:	[mm]/[Rev]
Max.:	100.00	Data Type:	UInt16
Default:	1.00	Change:	Real-time

Value Range:

0.00[mm]/[Rev]–100.00[mm]/[Rev]

Description

Defines the motor revolutions per inertia auto-tuning when H09.05 (Offline inertia auto-tuning mode) is set to 1 (Positive/Negative triangular wave mode).

Note:
When using the offline inertia auto-tuning function, check that the travel distance of the motor at the stop position is larger than the value of H09.09. If not, decrease the value of H09.06 (Maximum speed for inertia auto-tuning) or H09.07 (Time constant of accelerating to max. speed during inertia auto-tuning) properly until the motor travel distance fulfills the requirement.

H09.11 **Vibration threshold**

Address:	0x090B	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	5.0	Change:	Real-time

Value Range:
0.0% to 100.0%
Description
Defines the alarm threshold for current feedback vibration.

H09.12 **Frequency of the 1st notch**

Address:	0x090C	Effective mode:	Real-time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:
50 Hz–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 8000 Hz deactivates the notch function.

H09.13 **Width level of the 1st notch**

Address:	0x090D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:
0 to 20
Description

Defines the width level of the notch. Use the default setpoint in general cases. Width level is the ratio of the notch width to the notch center frequency.

H09.14 **Depth level of the 1st notch**

Address:	0x090E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 99

Description

Defines the depth level of the notch.

The depth level of the notch is the ratio between the input to the output at the notch center frequency.

The higher the setpoint, the lower the notch depth and the weaker the mechanical resonance suppression will be. Note that an excessively high setpoint may cause system instability.

H09.15 **Frequency of the 2nd notch**

Address:	0x090F	Effective mode:	Real-time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

50 Hz–8000 Hz

Description

Set the frequency of the 2nd notch.

H09.16 **Width level of the 2nd notch**

Address:	0x0910	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:

0 to 20

Description

Set the width level of the 2nd notch.

H09.17 Depth level of the 2nd notch

Address:	0x0911	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 99

Description

Set the depth level of the 2nd notch.

H09.18 Frequency of the 3rd notch

Address:	0x0912	Effective mode:	Real-time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

50 Hz–8000 Hz

Description

Set the frequency of the 3rd notch.

H09.19 Width level of the 3rd notch

Address:	0x0913	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:

0 to 20

Description

Set the width level of the 3rd notch.

H09.20 Depth level of the 3rd notch

Address:	0x0914	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 99

Description

Set the depth level of the 3rd notch.

H09.21 Frequency of the 4th notch

Address:	0x0915	Effective mode:	Real-time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

50 Hz–8000 Hz

Description

Set the frequency of the 4th notch.

H09.22 Width level of the 4th notch

Address:	0x0916	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:

0 to 20

Description

Set the width level of the 4th notch.

H09.23 Depth level of the 4th notch

Address:	0x0917	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 99

Description

Set the depth level of the 4th notch.

H09.24 Auto-tuned resonance frequency

Address:	0x0918	Effective mode:	-
Min.:	0	Unit:	Hz
Max.:	5000	Data Type:	UInt16

Default:	0	Change:	Unchangeable

Value Range:

0 Hz–5000 Hz

Description

When H09.02 (Adaptive notch mode) is set to 3, the current mechanical resonance frequency is displayed.

H09.32 **Gravity compensation value**

Address:	0x0920	Effective mode:	Real-time
Min.:	-100.0	Unit:	%
Max.:	100.0	Data Type:	Int16
Default:	0.0	Change:	Real-time

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**

Address:	0x0921	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0% to 100.0%

Description

Defines the forward friction compensation value.

H09.34 **Negative friction compensation value**

Address:	0x0922	Effective mode:	Real-time
Min.:	-100.0	Unit:	%
Max.:	0.0	Data Type:	Int16
Default:	0.0	Change:	Real-time

Value Range:

-100.0% to 0.0%

Description

Defines the reverse direction friction compensation value.

H09.35 Friction compensation speed

Address:	0x0923	Effective mode:	Real-time
Min.:	0.0	Unit:	-
Max.:	20.0	Data Type:	UInt16
Default:	2.0	Change:	Real-time

Value Range:

0.0 to 20.0

Description

Defines the friction compensation speed.

H09.36 Friction compensation speed

Address:	0x0924	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0x13	Data Type:	UInt16
Default:	0x0	Change:	Real-time

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

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

H09.37 Vibration monitoring time

Address:	0x0925	Effective mode:	Real-time
Min.:	0	Unit:	s

Max.:	65535	Data Type:	UInt16
Default:	300	Change:	Real-time

Value Range:

0s to 65535s

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 (in seconds).

H09.38 Frequency of low-frequency resonance suppression 1 at the mechanical end

Address:	0x0926	Effective mode:	Real-time
Min.:	1.0	Unit:	Hz
Max.:	100.0	Data Type:	UInt16
Default:	100.0	Change:	At stop

Value Range:

1.0 Hz–100.0 Hz

Description

Set this parameter based on the actual jitter frequency.

H09.39 Low-frequency resonance suppression 1 at the mechanical end

Address:	0x0927	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0 to 3

Description

Defines different low-frequency resonance suppression types at the mechanical load. Type 1 features the shortest delay.

H09.41 Frequency of the 5th notch

Address:	0x0929	Effective mode:	Real-time
Min.:	50	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

50 Hz–8000 Hz

Description

Sets the frequency of the 5th notch.

H09.42 Width level of the 5th notch

Address:	0x092A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	20	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:

0 to 20

Description

Set the width level of the 5th notch.

H09.43 Depth level of the 5th notch

Address:	0x092B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 99

Description

Set the depth level of the 5th notch.

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

Address:	0x092C	Effective mode:	Real-time
Min.:	0.0	Unit:	Hz
Max.:	200.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 Hz–200.0 Hz

Description

Set this parameter based on the actual jitter frequency.

H09.45 Responsiveness of low-frequency resonance suppression 2 at mechanical load end

Address:	0x092D	Effective mode:	Real-time

Min.:	0.01	Unit:	-
Max.:	10.00	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.01 to 10.00

Description

Use the default setpoint in general cases. To increase the setpoint, reduce the delay time.

H09.47 Width of low-frequency resonance suppression 2 at mechanical load end

Address:	0x092F	Effective mode:	Real-time
Min.:	0.00	Unit:	-
Max.:	2.00	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.00 to 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 the mechanical end

Address:	0x0931	Effective mode:	Real-time
Min.:	0.0	Unit:	Hz
Max.:	200.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 Hz–200.0 Hz

Description

Set the frequency of low-frequency resonance suppression 3 at mechanical load end.

H09.50 Responsiveness of low-frequency resonance suppression 3 at mechanical load end

Address:	0x0932	Effective mode:	Real-time
Min.:	0.01	Unit:	-
Max.:	10.00	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.01 to 10.00

Description

Set the responsiveness of low-frequency resonance suppression 3 at mechanical load end.

H09.52 **Width of low-frequency resonance suppression 3 at mechanical load end**

Address:	0x0934	Effective mode:	Real-time
Min.:	0.00	Unit:	-
Max.:	2.00	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.00 to 2.00

Description

Set the width of low-frequency resonance suppression 3 at mechanical load end.

H09.54 **Resonance detection torque threshold**

Address:	0x0936	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	300.0	Data Type:	UInt16
Default:	50.0	Change:	Real-time

Value Range:

0.0% to 300.0%

Description

If the torque fluctuation exceeds the setpoint, an error will be reported. Setting this parameter to 0 hides the resonance detection function.

H09.56 **Max. overshoot allowed by ETune**

Address:	0x0938	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	2936	Change:	Real-time

Value Range:

0 to 65535

Description

Defines the maximum overshoot value allowed during ETune adjustment.

H09.57 STune resonance suppression switchover frequency

Address:	0x0939	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	4000	Data Type:	UInt16
Default:	650	Change:	Real-time

Value Range:

0 Hz–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. When the setpoint of 09.57 exceeds the upper limit of the medium-frequency suppression frequency 2 (1000 Hz), the medium-frequency suppression does not take effect.

H09.58 STune resonance suppression reset selection

Address:	0x093A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

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.

0: Disabled

1: Enabled

H09.62 Stune stop delay judgment

Address:	0x093E	Effective mode:	Real-time
Min.:	0.00	Unit:	ms
Max.:	50.00	Data Type:	UInt16
Default:	1.00	Change:	Real-time

Value Range:

0.00 ms–50.00 ms

Description

Set Stune stop delay threshold.

H09.63 **STune quick convergence speed**

Address:	0x093F	Effective mode:	Real-time
Min.:	0.00	Unit:	-
Max.:	50.00	Data Type:	UInt16
Default:	1.00	Change:	Real-time

Value Range:

0.00 to 50.00

Description

Set STune quick convergence speed.

H09.71 **Starting frequency**

Address:	0x0947	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	15	Change:	Real-time

Value Range:

0 Hz–8000 Hz

Description

Set the starting frequency for high-performance auto-tuning sweep frequency.

H09.72 **End frequency**

Address:	0x0948	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

0 Hz–8000 Hz

Description

Set the end frequency for high-performance auto-tuning sweep frequency.

H09.73 **Frequency subdivision**

Address:	0x0949	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	500	Data Type:	UInt16
Default:	50	Change:	Real-time

Value Range:

0 to 500

Description

Set the frequency resolution for high-performance auto-tuning low frequency band (start frequency–start frequency 2). The larger the setting, the smaller the resolution.

H09.74 Excitation amplitude

Address:	0x094A	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	15.0	Change:	Real-time

Value Range:

0.0% to 400.0%

Description

Set the excitation amplitude for high-performance auto-tuning sweep frequency.

H09.75 Starting frequency 2

Address:	0x094B	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	8000	Data Type:	UInt16
Default:	500	Change:	Real-time

Value Range:

0 Hz–8000 Hz

Description

Set the starting frequency for medium and high frequency in high-performance auto-tuning.

H09.76 Frequency subdivision 2

Address:	0x094C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1000	Data Type:	UInt16
Default:	500	Change:	Real-time

Value Range:

0 to 1000

Description

Set the frequency resolution for high-performance auto-tuning low frequency band (start frequency 2–end frequency). The larger the setting, the smaller the resolution.

H09.77 Biquad filter mode

Address:	0x094D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	6	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disabled

1: First-order low-pass

2: Second-order low-pass

3: Notch

4: Lead-lag

5: User-defined

Description

Used to select biquad filter mode.

0: Disabled

1: First-order low-pass

2: Second-order low-pass

3: Notch

4: Lead-lag

5: User-defined

H09.78 Biquad filter numerator frequency

Address:	0x094E	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	16000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

0 Hz–16000 Hz

Description

Set the biquad filter numerator frequency.

H09.79 Biquad filter numerator damping coefficient

Address:	0x094F	Effective mode:	Real-time
Min.:	0.001	Unit:	-
Max.:	10.000	Data Type:	UInt16
Default:	1.000	Change:	Real-time

Value Range:

0.001 to 10.000

Description

Set the biquad filter numerator damping coefficient.

H09.80 **Biquad filter denominator frequency**

Address:	0x0950	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	16000	Data Type:	UInt16
Default:	8000	Change:	Real-time

Value Range:

0 Hz–16000 Hz

Description

Set the biquad filter denominator frequency.

H09.81 **Biquad filter denominator damping coefficient**

Address:	0x0951	Effective mode:	Real-time
Min.:	0.001	Unit:	-
Max.:	10.000	Data Type:	UInt16
Default:	1.000	Change:	Real-time

Value Range:

0.001 to 10.000

Description

Set the biquad filter denominator damping coefficient.

8.11 H0A Fault and Protection Parameters

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

Address:	0x0A00	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Enable

1: Disable

Description

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

H0A.01 **Absolute position limit**

Address:	0x0A01	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

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.
0: Disabled
1: Enabled
2: Enabled after homing

H0A.04 **Motor overload protection gain**

Address:	0x0A04	Effective mode:	Real-time
Min.:	50	Unit:	-
Max.:	300	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:
50 to 300

Description

When the internal overload curve is used (H32.70 = 0), set E620.0 (Motor overload fault) by H0A.04.
You can change the setpoint to advance or delay the time when overload protection is triggered based on the motor temperature. The setpoint 50% indicates the time is cut by half; 150% indicates the time is increased by 50%. Set this parameter based on the actual temperature of the motor.

H0A.08 Overspeed threshold

Address:	0x0A08	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]
Max.:	20000	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0[mm/s]/[rpm]–20000[mm/s]/[rpm]

Description

Defines the overspeed threshold of the motor.

H0A.10 Threshold of excessive local position deviation

Address:	0x0A0A	Effective mode:	Real-time
Min.:	0	Unit:	encoder unit
Max.:	4294967295	Data Type:	UInt32
Default:	219895614	Change:	Real-time

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 enable

Address:	0x0A0C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time

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.13 **Angle auto-tuning mode**

Address:	0x0A0D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	10	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: pre-positioning
1: Inching
2: Voltage injection
8: Closed-loop pre-positioning
9: Position locking

Description

Selects the motor angle auto-tuning mode:
0: pre-positioning

1: Inching
2: Voltage injection
8: Closed-loop pre-positioning9: Position locking
Limitation for method 2:
1. It is only applicable to motors with iron cores, like ROT motors.
2. If other auto-tuning methods fail, you can use method 2 after performing the following test. Without power-off and without a software reset, perform angle auto-tuning with method 2 at five different positions and record the results (H00.28). If the maximum deviation among the five results is within 5400, you can use method 2 on the motor.

H0A.18 **IGBT over-temperature threshold**

Address:	0x0A12	Effective mode:	Real-time
Min.:	120	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	140	Change:	Real-time

Value Range:

120°C–175°C

Description

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

H0A.19 **Filter time constant of touch probe 1**

Address:	0x0A13	Effective mode:	Real-time

Min.:	0.00	Unit:	μs
Max.:	6.30	Data Type:	UInt16
Default:	2.00	Change:	Real-time

Value Range:

0.00μs to 6.30μs

Description

Defines the filter time of touch probe 1. An active input must last for the time defined by H0A.19.

H0A.20 **Filter time constant of touch probe 2**

Address:	0x0A14	Effective mode:	Real-time
Min.:	0.00	Unit:	μs
Max.:	6.30	Data Type:	UInt16
Default:	2.00	Change:	Real-time

Value Range:

0.00μs to 6.30μs

Description

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

H0A.21 **STO function display selection**

Address:	0x0A15	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	5	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 5

Description

Defines whether to display the STO status or report E150.0 after the STO function is triggered.

Bit0 = 0: Displays the STO status. The keypad displays "sto_" after the STO function is triggered. In this case, no fault is reported and no output is generated from the fault DO.

Bit0 = 1: Displays the STO fault. The keypad displays "E150.0" after the STO function is triggered. In this case, the servo drive reports E150.0 and the fault DO generates output.

Bit1 is disabled.

Bit2 = 0: Performs STO noise diagnosis, and displays E150.5.

Bit2 = 1: Hides STO noise diagnosis, and does not display E150.5.

H0A.23 **TZ signal filter time**

Address:	0x0A17	Effective mode:	Upon the next power-on
Min.:	0	Unit:	25ns
Max.:	31	Data Type:	UInt16
Default:	15	Change:	At stop

Value Range:

0 ns–31 ns

Description

Set TZ signal filter time.

H0A.25 **Speed display DO low-pass filter time**

Address:	0x0A19	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	5000	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms–5000 ms

Description

Defines the low-pass filter time constant of the speed information for speed feedback and position references.

H0A.26 **Motor overload detection**

Address:	0x0A1A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Show motor overload alarm (A909.0) and fault (E620.0)

1: Hide motor overload alarm (E909.0) and fault (E620.0)

Description

Defines whether to enable motor overload detection.

0: Show motor overload alarm (A909.0) and fault (E620.0)

1: Hide motor overload alarm (E909.0) and fault (E620.0)

H0A.27 **Average filter time for speed display DO**

Address:	0x0A1B	Effective mode:	Real-time
Min.:	0	Unit:	ms

Max.:	100	Data Type:	UInt16
Default:	50	Change:	At stop

Value Range:

0 ms–100 ms

Description

Defines the average filter time constant of the speed information for speed feedback and position references.

H0A.28 Quadrature encoder filter time

Address:	0x0A1C	Effective mode:	Upon the next power-on
Min.:	0	Unit:	25ns
Max.:	255	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0 ns–255 ns

Description

Defines the quadrature encoder feedback filter time.

H0A.29 Fully closed-loop encoder (ABZ) filter time

Address:	0x0A1D	Effective mode:	Upon the next power-on
Min.:	0	Unit:	25ns
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

Bit0–bit7: Fully closed-loop encoder (ABZ) pulse signal filter time

Bit8–bit15: Fully closed-loop encoder (ABZ) wire breakage filter time

H0A.32 Time threshold for locked motor overheat protection

Address:	0x0A20	Effective mode:	Real-time
Min.:	10	Unit:	ms
Max.:	65535	Data Type:	UInt16
Default:	200	Change:	Real-time

Value Range:

10 ms–65535 ms

Description

Defines the overtemperature duration before E630.0 (Motor stall) is detected by the servo drive.
H0A.32 can be used to adjust the sensitivity of motor stall over-temperature detection.

H0A.33 **Locked motor overheat protection**

Address:	0x0A21	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

0: Disabled

1: Enabled

Description

Enables or disables the detection for E630.0 (Motor stall overtemperature protection).

0: Disabled

1: Enabled

H0A.36 **Encoder multi-turn overflow fault selection**

Address:	0x0A24	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

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).

0: Not hide

1: Hide

H0A.40 **Compensation function selection**

Address:	0x0A28	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0x1F	Data Type:	UInt16
Default:	0x6	Change:	At stop

Value Range:

bit0: Overtravel compensation
0: Enabled
1: Disabled
bit1: Touch probe rising edge compensation
0: Disabled
1: Enabled
bit2: Touch probe falling edge compensation
0: Disabled
1: Enabled
bit3: Touch probe scheme
0: New scheme
1: Old scheme (same as SV660N)
bit4: Probe 2 separate compensation time enable
0: Disabled
1: Enabled

Description

Select compensation.
Bit0: Overtravel compensation
0: Enabled
1: Disabled
bit1: Probe rising edge compensation
0: Disabled
1: Enabled
bit2: Probe falling edge compensation
0: Disabled
1: Enabled
bit3: Probe scheme
0: New scheme
1: Old scheme (same as SV660N)
bit4: Probe 2 separate compensation time
0: Disabled
1: Enabled

H0A.41 Forward position of software position limit

Address:	0x0A29	Effective mode:	Real-time
Min.:	-2147483648	Unit:	reference 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/A950.0 and executes stop at forward limit.

H0A.43 **Reverse position of software position limit**

Address:	0x0A2B	Effective mode:	Real-time
Min.:	-2147483648	Unit:	reference unit
Max.:	2147483647	Data Type:	Int32
Default:	-2147483648	Change:	At stop

Value Range:

-2147483648 to 2147483647

Description

When the absolute position counter (H0b.07) is smaller than H0A.43, the servo drive reports E952.0/A952.0 and executes stop at reverse limit.

H0A.50 **Encoder communication fault tolerance threshold**

Address:	0x0A32	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	31	Change:	Real-time

Value Range:

0 to 31

Description

When the communication between the encoder and the drive fails continuously for more than H0A.50 times, it is considered as a communication failure with the encoder. When overspeed point mask is enabled, if the number of consecutive overspeed points exceed H0A.50, it is considered as a communication failure with the encoder.

H0A.51 **Phase loss detection filter times**

Address:	0x0A33	Effective mode:	Real-time
Min.:	3	Unit:	55ms
Max.:	36	Data Type:	UInt16
Default:	20	Change:	Real-time

Value Range:

3 ms–36 ms

Description

Phase loss fault is reported when phase loss keeps active for a period longer than H0A.51.

H0A.52 **Encoder temperature protection threshold**

Address:	0x0A34	Effective mode:	Real-time
Min.:	0	Unit:	°C
Max.:	175	Data Type:	UInt16
Default:	120	Change:	Real-time

Value Range:

0°C–175°C

Description

Defines the temperature threshold for encoder overtemperature protection.

H0A.53 **Probe DI ON compensation time**

Address:	0x0A35	Effective mode:	Real-time
Min.:	-3000	Unit:	25ns
Max.:	3000	Data Type:	Int16
Default:	200	Change:	Real-time

Value Range:

-3000 ns–3000 ns

Description

Used to compensate for the action time when the touch probe is switched on.

H0A.54 **Probe DI OFF compensation time**

Address:	0x0A36	Effective mode:	Real-time
Min.:	-3000	Unit:	25ns
Max.:	3000	Data Type:	Int16
Default:	1512	Change:	Real-time

Value Range:

-3000 ns–3000 ns

Description

Used to compensate for the action time when the touch probe is switched off.

H0A.55 **Runaway current threshold**

Address:	0x0A37	Effective mode:	Real-time
Min.:	100.0	Unit:	%
Max.:	400.0	Data Type:	UInt16
Default:	200.0	Change:	Real-time

Value Range:

100.0% to 400.0%

Description

Defines the current threshold for runaway protection detection.

H0A.56 **Fault reset delay**

Address:	0x0A38	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	60000	Data Type:	UInt16
Default:	10000	Change:	Real-time

Value Range:

0 ms–60000 ms

Description

Set the fault reset delay.

H0A.57 **Runaway speed threshold**

Address:	0x0A39	Effective mode:	Real-time
Min.:	1	Unit:	[mm/s]/[rpm]
Max.:	1000	Data Type:	UInt16
Default:	50	Change:	Real-time

Value Range:

1[mm/s]/[rpm]–1000[mm/s]/[rpm]

Description

Defines the overspeed threshold for runaway protection detection.

H0A.58 **Runaway speed filter time**

Address:	0x0A3A	Effective mode:	Upon the next power-on
Min.:	0.1	Unit:	ms
Max.:	100.0	Data Type:	UInt16
Default:	2.0	Change:	Real-time

Value Range:

0.1 ms–100.0 ms

Description

Defines the speed feedback filter time for runaway protection detection.

H0A.59 **Runaway protection detection time**

Address:	0x0A3B	Effective mode:	Real-time
Min.:	10	Unit:	ms
Max.:	1000	Data Type:	UInt16

Default:	30	Change:	Real-time

Value Range:

10 ms–1000 ms

Description

The runaway fault will be reported when runaway keeps active for a period longer than H0A.59.

H0A.60 Black box function mode

Address:	0x0A3C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	1	Change:	Real-time

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.

0: Disable

1: Any fault

2: Designated fault

3: Triggered based on designated condition

H0A.61 Designated fault code

Address:	0x0A3D	Effective mode:	Real-time
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Real-time

Value Range:

0.0 to 6553.5

Description

Defines the fault code for triggering the black box function.

H0A.62 Trigger source

Address:	0x0A3E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16

Default:	0	Change:	Real-time

Value Range:

0 to 31

Description

Defines the fault code for triggering the black box function through designated channel.

H0A.63 **Trigger level**

Address:	0x0A3F	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

Defines the trigger level for triggering the black box function through designated channel.

H0A.65 **Trigger level**

Address:	0x0A41	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Real-time

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.

0: Rising edge
1: Equal
2: Falling edge
3: Edge-triggered

H0A.66 **Trigger position**

Address:	0x0A42	Effective mode:	Real-time
Min.:	0	Unit:	%

Max.:	100	Data Type:	UInt16
Default:	75	Change:	Real-time

Value Range:

0% to 100%

Description

Defines the pre-trigger position for triggering black box sampling.

H0A.67 Sampling frequency

Address:	0x0A43	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Current loop

1: Position loop

2: Main cycle

Description

Defines the frequency sampling mode during black box sampling.

0: Current loop

1: Position loop

2: Main cycle

H0A.70 Overspeed threshold 2

Address:	0x0A46	Effective mode:	Real-time
Min.:	0	Unit:	[mm/s]/[rpm]
Max.:	20000	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0[mm/s]/[rpm]–20000[mm/s]/[rpm]

Description

Defines the speed threshold for reporting E500.2 (Position feedback pulse overspeed).

H0A.71 Internal function switch

Address:	0x0A47	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	4098	Change:	Real-time

Value Range:
0 to 65535
Description

bit	Function	Description
0	MS1 overload curve selection	0: New 1: Old
1	Power failure bleeder switch	0: Enabled 1: Hide
2	Forced brake motor stop mode	0: Forced stop 1: Non-forced stop
3	New external characteristics switch of multi-speed DI mode	0: Old characteristics 1: New characteristics
4	A120.3 hide switch	0: Hide 1: Not hide
5	Prohibit software reading parameters	0: Disabled 1: Enabled
6	A108.4 hide switch	0: Not hide 1: Hide
7	CSV command interpolation	0: Sync interrupt interpolation 1: IRQ interrupt interpolation
8	Data type of motor rated current, inertia and back EMF coefficient	0: 16-bit 1: 32-bit
9	Wire breakage detection	0: Enabled 1: Disabled
10	Torque limit source	0: Auto switch acc. to H02.00 1: H07.09 and H07.10
11	Ultra-accurate speed feedback switch	0: Disable 1: Enabled
12	Power failure retention of homing completion flag	0: Disabled 1: Enabled
13	STO status word fallback switch	0: Switch on disable 1: Fault
14	Encoder adaptive function switch	0: Enabled 1: Disable
15	Interrupt positioning external characteristics	0: Old external characteristics, follows motor operation direction 1: New external characteristics, direction set by parameter

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

Address:	0x0A48	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	65535	Data Type:	UInt16

Default:	10000	Change:	At stop

Value Range:

0 ms–65535 ms

Description

Defines the time for the motor to decelerate from the maximum speed to 0 [mm/s]/[rpm] during ramp-to-stop.

H0A.73 STO 24 V disconnection filter time

Address:	0x0A49	Effective mode:	Real-time
Min.:	1	Unit:	ms
Max.:	5	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1 ms–5 ms

Description

Defines the delay from the moment when 24V is disconnected to the moment when the STO state applies.

H0A.74 Filter time for two inconsistent STO channels

Address:	0x0A4A	Effective mode:	Real-time
Min.:	1	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:

1 ms–1000 ms

Description

Defines the delay from the moment the inconsistent 24V is input to the drive through two channels to the moment when the STO state applies.

H0A.75 Servo OFF delay after STO triggered

Address:	0x0A4B	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	25	Data Type:	UInt16
Default:	20	Change:	Real-time

Value Range:

0 ms–25 ms

Description

Defines the delay from the moment the STO state is triggered to the moment the S-ON signal is switched off.

H0A.81 Voltage drop protection enable

Address:	0x0A51	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Host controller executes torque limit

2: Servo executes torque limit

Description

Set the voltage drop protection selection.

0: No operation

1: Host controller executes torque limit

2: Servo executes torque limit

H0A.82 Voltage drop torque limit

Address:	0x0A52	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	100.0	Data Type:	UInt16
Default:	50.0	Change:	Real-time

Value Range:

0.0% to 100.0%

Description

Set the voltage drop torque limit.

H0A.83 Torque limit cancel time

Address:	0x0A53	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	1000	Data Type:	UInt16
Default:	100	Change:	Real-time

Value Range:

0 ms–1000 ms

Description

Set the torque limit cancel time.

H0A.84 Instantaneous power failure holding time

Address:	0x0A54	Effective mode:	Real-time

Min.:	20	Unit:	ms
Max.:	50000	Data Type:	UInt16
Default:	1000	Change:	Real-time

Value Range:

20 ms–50000 ms

Description

Set the instantaneous power failure holding time.

H0A.88 **BiSS-C data alarm enabled**

Address:	0x0A58	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 1

Description

Used to enable original BiSS-C data alarm function, which is only applicable to the encoder that adopts BiSS-C protocol.

H0A.89 **Correct state of BiSS-C data**

Address:	0x0A59	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0 to 31

Description

Defines the fault bit state during normal operation of BiSS-C.

H0A.90 **Speed display low-pass filter time**

Address:	0x0A5A	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms–100 ms

Description

Defines the low-pass filter time constant for displayed speed values.

H0A.91 **Moving average filter time for torque display values**

Address:	0x0A5B	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms–100 ms

Description

Defines the moving average filter time constant for torque display values.

H0A.92 **Moving average filter time for position display values**

Address:	0x0A5C	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	100	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms–100 ms

Description

Defines the moving average filter time constant for position display values.

H0A.93 **Low-pass filter time for voltage display values**

Address:	0x0A5D	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms–250 ms

Description

Defines the low-pass filter time constant for voltage display values.

H0A.94 **Low-pass filter time for thermal display values**

Address:	0x0A5E	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	250	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 ms–250 ms

Description

Defines the filter time constant for thermal display values.

8.12 H0b Monitoring Parameters

H0b.00 **Motor speed actual value**

Address:	0x0B00	Effective mode:	-
Min.:	-32767	Unit:	[mm/s]/[rpm]
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767[mm/s]/[rpm]–32767[mm/s]/[rpm]

Description

Indicates the actual motor speed after round-off, which is accurate to 1 [mm/s]/[rpm].

Set in H0A.25 (Filter time constant of speed feedback display) the filter time constant for H0b.00.

H0b.01 **Speed reference**

Address:	0x0B01	Effective mode:	-
Min.:	-32767	Unit:	[mm/s]/[rpm]
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767[mm/s]/[rpm]–32767[mm/s]/[rpm]

Description

Indicates the present speed reference (accurate to 1 [mm/s]/[rpm]) of the drive in the position and speed control modes.

H0b.02 **Internal torque reference**

Address:	0x0B02	Effective mode:	-
Min.:	-3276.7	Unit:	%
Max.:	3276.7	Data Type:	Int16
Default:	0.0	Change:	Unchangeable

Value Range:

-3276.7% to 3276.7%

Description

Displays present torque reference (accurate to 0.1%). The value 100.0% corresponds to the rated torque of the motor.

H0b.03 Input (DI) signal monitoring

Address:	0x0B03	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the level status of 5 DI terminals without filtering.

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

H0b.05 Output (DO) signal monitoring

Address:	0x0B05	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the level status of 2 DO terminals without filtering.

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

H0b.07 Absolute position counter

Address:	0x0B07	Effective mode:	-
Min.:	-2147483648	Unit:	reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Displays current absolute position of the motor (reference unit).
This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0b.09 Mechanical angle

Address:	0x0B09	Effective mode:	-
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 is 65535.

H0b.10 Electrical angle

Address:	0x0B0A	Effective mode:	-
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 ratio

Address:	0x0B0C	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	800.0	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0% to 800.0%

Description

Displays the percentage of the average load torque to the rated torque of the motor, which is accurate to 0.1%. The value 100.0% corresponds to the rated torque of the motor.

H0b.15 Position following error (encoder unit)

Address:	0x0B0F	Effective mode:	-
Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Used to count and display the position deviation value after being divided or multiplied by the electronic gear ratio in the position control mode.

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

Note:

H0b.15 can be clear when the condition defined in H05.16 (Clear action) is met.

H0b.17 Feedback pulse counter

Address:	0x0B11	Effective mode:	-
Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Used to count the position pulses fed back by the encoder in any control mode.

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

H0b.19 Total power-on time

Address:	0x0B13	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0.0	Change:	Unchangeable

Value Range:

0.0s–429496729.5s

Description

Used to record the total operating time of the servo drive.

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

Note:

If the servo drive is switched on and off repeatedly within a short period of time, a deviation within 1h may be present in the total power-on time record.

H0b.21 Displayed AI1 voltage

Address:	0x0B15	Effective mode:	-
Min.:	-327.67	Unit:	V
Max.:	327.67	Data Type:	Int16
Default:	0.00	Change:	Unchangeable

Value Range:

-327.67 V to 327.67 V

Description

Displays the actual sampling voltage of AI1.

H0b.22 Displayed AI2 voltage

Address:	0x0B16	Effective mode:	-
Min.:	-327.67	Unit:	V
Max.:	327.67	Data Type:	Int16
Default:	0.00	Change:	Unchangeable

Value Range:

-327.67 V to 327.67 V

Description

Displays the actual sampling voltage of AI2.

H0b.24 Phase current RMS value

Address:	0x0B18	Effective mode:	-
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 0.1 A.

H0b.25 Angle obtained upon voltage injection auto-tuning

Address:	0x0B19	Effective mode:	-
Min.:	0.0	Unit:	°
Max.:	360.0	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0° to 360.0°

Description

Display the angle obtained upon voltage injection auto-tuning.

H0b.26 Bus voltage

Address:	0x0B1A	Effective mode:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 V to 6553.5 V

Description

Displays the DC bus voltage of the main circuit input voltage after rectification, which is accurate to 0.01 V.

H0b.27 Module temperature

Address:	0x0B1B	Effective mode:	-
Min.:	-20	Unit:	°C
Max.:	200	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-20°C–200°C

Description

Indicates the temperature of the module inside the servo drive, which can be used as a reference for estimating the actual temperature of the drive.

H0b.28 Absolute encoder fault information given by FPGA

Address:	0x0B1C	Effective mode:	-

Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display the absolute encoder fault information given by FPGA.

H0b.29 Axis status information given by FPGA

Address:	0x0B1D	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display axis status information given by FPGA.

H0b.30 Axis fault information given by FPGA

Address:	0x0B1E	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display axis fault information given by FPGA.

H0b.31 Encoder fault information

Address:	0x0B1F	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display encoder internal fault information.

H0b.33 Fault log

Address:	0x0B21	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	19	Data Type:	UInt16
Default:	0	Change:	Real-time

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 latest 20 faults of the drive.
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

H0b.34 Fault code of the selected fault

Address:	0x0B22	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFF
Description
Display the fault code of the selected fault.

H0b.35 Timestamp of the selected fault

Address:	0x0B23	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32
Default:	0.0	Change:	Unchangeable

Value Range:
0.0s–429496729.5s
Description
Display timestamp of the selected fault.

H0b.37 Motor speed upon occurrence of the selected fault

Address:	0x0B25	Effective mode:	-
Min.:	-32767	Unit:	[mm/s]/[rpm]
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32767[mm/s]/[rpm]–32767[mm/s]/[rpm]

Description

Display motor speed upon occurrence of the selected fault.

H0b.38 Motor phase U current upon occurrence of the selected fault

Address:	0x0B26	Effective mode:	-
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

Display the motor phase U current upon occurrence of the selected fault.

H0b.39 Motor phase V current upon occurrence of the selected fault

Address:	0x0B27	Effective mode:	-
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

Display the motor phase V current upon occurrence of the selected fault.

H0b.40 Bus voltage upon occurrence of the selected fault

Address:	0x0B28	Effective mode:	-
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

Display the bus voltage upon occurrence of the selected fault.

H0b.41 Input terminal state on selected fault

Address:	0x0B29	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Display input terminal state on selected fault.

H0b.43 Output terminal status upon occurrence of the selected fault

Address:	0x0B2B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Display output terminal status upon occurrence of the selected fault.

H0b.45 Internal fault code

Address:	0x0B2D	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display the internal fault code.

H0b.46 Absolute encoder fault information given by FPGA upon occurrence of the selected fault

Address:	0x0B2E	Effective mode:	-
Min.:	0x0	Unit:	-

Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFF
Description
Display the absolute encoder fault information given by FPGA upon occurrence of the selected fault.

H0b.47 System status information given by FPGA upon occurrence of the selected fault

Address:	0x0B2F	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFF
Description
Display the system status information given by FPGA upon occurrence of the selected fault.

H0b.48 System fault information given by FPGA upon occurrence of the selected fault

Address:	0x0B30	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFF
Description
Display the system fault information given by FPGA upon occurrence of the selected fault.

H0b.49 Encoder fault information upon occurrence of the selected fault

Address:	0x0B31	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFF

Description

Display the encoder fault information upon occurrence of the selected fault.

H0b.51 **Internal fault code upon occurrence of the selected fault**

Address:	0x0B33	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display internal fault code upon occurrence of the selected fault.

H0b.52 **FPGA timeout fault standard bit upon occurrence of the selected fault**

Address:	0x0B34	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display the FPGA timeout fault standard bit upon occurrence of the selected fault.

H0b.53 **Position following error (reference unit)**

Address:	0x0B35	Effective mode:	-
Min.:	-2147483648	Unit:	reference unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

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 encoder 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 Actual motor speed 2

Address:	0x0B37	Effective mode:	-
Min.:	-214748364.8	Unit:	[mm/s]/[rpm]
Max.:	214748364.7	Data Type:	Int32
Default:	0.0	Change:	Unchangeable

Value Range:

-214748364.8[mm/s]/[rpm]–214748364.7[mm/s]/[rpm]

Description

Displays the actual motor speed, accurate to 0.1 [mm/s]/[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 Control circuit bus voltage

Address:	0x0B39	Effective mode:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 V to 6553.5 V

Description

Displays the bus voltage of the control circuit.

H0b.58 Mechanical absolute position (low 32 bits)

Address:	0x0B3A	Effective mode:	-
Min.:	0	Unit:	encoder unit
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the low 32-bit value (encoder unit) of the mechanical position feedback when the absolute encoder is used.

H0b.60 Mechanical absolute position (high 32 bits)

Address:	0x0B3C	Effective mode:	-

Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Displays the high 32-bit value (encoder unit) of the mechanical position feedback when the absolute encoder is used.

H0b.63 NotRdy state

Address:	0x0B3F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9	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

9: Fully closed-loop encoder initialization not completed

Description

Displays the reason for the NRD 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

9: Fully closed-loop encoder initialization not completed

H0b.66 Encoder temperature

Address:	0x0B42	Effective mode:	-

Min.:	-32768	Unit:	°C
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32768°C–32767°C

Description

Indicates the encoder temperature value.

H0b.67 Load rate of braking resistor

Address:	0x0B43	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	200.0	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0% to 200.0%

Description

Display load rate of the braking resistor.

H0b.70 Number of absolute encoder revolutions

Address:	0x0B46	Effective mode:	-
Min.:	-32768	Unit:	Rev
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32768Rev to 32767Rev

Description

Indicates the number of revolutions of the absolute encoder.

H0b.71 Single-turn position fed back by the absolute encoder

Address:	0x0B47	Effective mode:	-
Min.:	0	Unit:	encoder unit
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 2147483647

Description

Displays the position feedback of the absolute encoder within one turn.

H0b.74 **System fault information given by FPGA**

Address:	0x0B4A	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display system fault information given by FPGA.

H0b.77 **Encoder position (low 32 bits)**

Address:	0x0B4D	Effective mode:	-
Min.:	0	Unit:	encoder unit
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the low 32-bit value of the position feedback of the absolute encoder.

H0b.79 **Encoder position (high 32 bits)**

Address:	0x0B4F	Effective mode:	-
Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Displays the high 32-bit value of the position feedback of the absolute encoder.

H0b.81 **Single-turn position of the rotary load (low 32 bits)**

Address:	0x0B51	Effective mode:	-
Min.:	0	Unit:	encoder unit
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the low 32-bit value of the position feedback of the rotary load when the absolute system works in the rotation mode.

H0b.83 Single-turn position of the rotary load (high 32 bits)

Address:	0x0B53	Effective mode:	-
Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Displays the high 32-bit value of the position feedback of the rotary load when the absolute system works the rotation mode.

H0b.85 Single-turn position of the rotary load (reference unit)

Address:	0x0B55	Effective mode:	-
Min.:	0	Unit:	reference unit
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the high 32-bit value of the position feedback of the rotary load when the absolute system works the rotation mode.

H0b.87 IGBT junction temperature

Address:	0x0B57	Effective mode:	-
Min.:	0	Unit:	°C
Max.:	200	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0°C–200°C

Description

Display IGBT junction temperature.

H0b.90 Group No. of the abnormal parameter

Address:	0x0B5A	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Set the group number of the abnormal parameter.

H0b.91 Offset within the group of the abnormal parameter

Address:	0x0B5B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Display offset within the group of the abnormal parameter.

H0b.93 Closed loop state

Address:	0x0B5D	Effective mode:	-
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.

0: Half closed loop

1: Fully closed loop

H0b.94 Individual power-on time

Address:	0x0B5E	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	429496729.5	Data Type:	UInt32

Default:	0.0	Change:	Unchangeable

Value Range:

0.0s–429496729.5s

Description

Display the individual power-on time of the drive.

H0b.96 Individual power-on time upon occurrence of the selected fault

Address:	0x0B60	Effective mode:	-
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 upon occurrence of the selected fault.

H0b.98 Dynamic braking resistor load rate

Address:	0x0B62	Effective mode:	-
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.

8.13 H0C Fault and Protection Parameters 2

H0C.53 Probe DI ON compensation time 2

Address:	0x0C35	Effective mode:	Real-time
Min.:	-3000	Unit:	25ns
Max.:	3000	Data Type:	Int16
Default:	200	Change:	Real-time

Value Range:

-3000 ns–3000 ns

Description

Used to compensate for the action time when touch probe 2 is switched on. (Effective when H0A_40 bit4 = 1)

H0C.54 Probe DI OFF compensation time 2

Address:	0x0C36	Effective mode:	Real-time
Min.:	-3000	Unit:	25ns
Max.:	3000	Data Type:	Int16
Default:	1512	Change:	Real-time

Value Range:

-3000 ns–3000 ns

Description

Used to compensate for the action time when touch probe 2 is switched off. (Effective when H0A_40 bit4 = 1)

H0C.71 Internal function switch

Address:	0x0C47	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	520	Change:	Real-time

Value Range:

0 to 65535

Description

Bit 3: AC3 software limit pre-planning switch

bit9: FPGA encoder feedback overspeed point hide switch

H0C.73 Servo function switchover switch 3

Address:	0x0C49	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit1: Switch encoder communication baud rate to 2M upon power-on

0: Enabled

1: Disabled

Bit6: Prohibit soft/hard limit under AC4

0: Prohibited

1: Not prohibited

Bit9: Prohibit ramp generation time under AC4

0: Prohibited

1: Not prohibited

Description

Bit1: Switch encoder communication baud rate to 2M upon power-on.

Bit6: When this bit is set to 0 and H02.07 is not 8, the DI limit and soft limit function is prohibited under AC4.

Bit9: Whether to prohibit homing and whether the ramp generation time is non-zero under AC4.

8.14 H0d Auxiliary Parameters

H0d.00 Software Reset

Address:	0x0D00	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Enable

Description

0: No operation

1: Enabled

Programs in the drive are reset automatically (similar to the program reset upon power-on) after the software reset function is enabled, without the need for a power cycle.

H0d.01 Fault reset

Address:	0x0D01	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Enable

Description

0: No operation
1: Enable
Resettable faults of Level 1 and level 2 can be reset only when the servo drive is not in running state after the fault causes are eliminated. Then, the servo drive do not display the faults and enters the "rdy" state.
When a No. 3 alarm occurs, you can enable the fault reset function directly, regardless of the servo drive status.

H0d.02 **Inertia auto-tuning enable**

Address:	0x0D02	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:
0 to 65
Description
Used to enable offline inertia auto-tuning through the keypad. In the parameter display mode, switch to H0d.02 and press the SET key to enable offline inertia auto-tuning.

H0d.04 **Read/write in encoder ROM**

Address:	0x0D04	Effective mode:	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
For Inovance encoders, the USB and control circuit need to be disconnected after writing in ROM to activate parameters. Also ensure that the drive is powered on during parameter writing.
0: No operation
1: Write ROM
2: Read ROM
3: ROM failure

H0d.05 **Emergency stop**

Address:	0x0D05	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No operation

1: Emergency stop

Description

Trigger emergency stop.

Note: The emergency stop mode corresponding to H0D.05 is defined by H02.05.

H0d.06 **Current loop auto-tuning test**

Address:	0x0D06	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	6	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Enable current loop auto-tuning

2: Enable current loop step test (static)

3: Enable current loop step test

Description

0: No operation

1: Enable current loop auto-tuning

2: Enable current loop step test (static)

3: Enable current loop step test

H0d.10 **Analog channel auto adjusting**

Address:	0x0D0A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Adjusted through AI1

2: Adjusted through AI2

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.
0: No operation
1: Adjusted through AI1
2: Adjusted through AI2

H0d.12 **Phase U/V current balance correction**

Address:	0x0D0C	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Disabled
1: Enabled
Description
Enable/disable phase U/V current balance correction.
0: Disabled
1: Enabled

H0d.17 **Forced DI/DO enable switch**

Address:	0x0D11	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Real-time

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.
Bit0: Forced DI enable switch
0: Disabled
1: Enabled
bit1: Forced DO enable switch
0: Disabled1: Enabled

H0d.18 **Forced DI value**

Address:	0x0D12	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0x1F	Data Type:	UInt16
Default:	0x1F	Change:	Real-time

Value Range:

0x0 to 0x1F

Description

Defines whether the DI functions set in group H03 is active when forced DI is activated (H0d.17 = 1 or 3).

The value of H0d.18 is displayed as a hexadecimal on the keypad. When it is converted to a binary value, "bit(n) = 1" indicates the level logic of DI function is high level; "bit(n) = 0" indicates the level logic of the DI function is low level.

H0d.19 **Forced DO value**

Address:	0x0D13	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0x3	Data Type:	UInt16
Default:	0x0	Change:	Real-time

Value Range:

0x0 to 0x3

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**

Address:	0x0D14	Effective mode:	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.

0: No operation

1: Reset fault

2: Reset fault and multi-turn data3: Reset Inovance 2nd encoder fault

4: Reset Inovance 2nd encoder fault and multi-turn data

Note: Fault reset is only available for the Inovance communication encoder.

H0d.21 Read error status bit of EnDat2.2 encoders

Address:	0x0D15	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Reading error status bit

Description

Read error status bit of EnDat2.2 encoders.

0: No operation

1: Reading error status bit

H0d.29 Motor parameter auto-tuning

Address:	0x0D1D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: No operation

1: Enabled

Description

Resistor inductance auto-tuning.

0: No operation

1: Enabled

8.15 H0E Communication Function Parameters

H0E.01 **Save objects written through communication to EEPROM**

Address:	0x0E01	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

0: Do not save

1: Save upon parameter writing

Description

Save/do not save settings during parameter writing through serial port or aperiodic communication.

0: Do not save

1: Save upon parameter writing

H0E.80 **Modbus baud rate**

Address:	0x0E50	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	9	Data Type:	UInt16
Default:	9	Change:	Real-time

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.

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

H0E.81 **Modbus data format**

Address:	0x0E51	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	3	Change:	Real-time

Value Range:

0: No parity, 2 stop bits (N-2)

1: Even parity, 1 stop bit (E-1)

2: Odd parity, 1 stop bit (O-1)

3: No parity, 1 stop bit (N-1)

Description

Defines the data check mode between the servo drive and the host controller during communication.

0: No parity, 2 stop bits

1: Even parity, 1 stop bit

2: Odd parity, 1 stop bit

3: No parity, 1 stop bit

The data format of the servo drive must be the same as that of the host controller. Otherwise, communication will fail.

H0E.82 **Modbus response delay**

Address:	0x0E52	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	20	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–20 ms

Description

Defines the delay from the moment when the slave receives a command from the host controller to the moment when the slave returns a response.

H0E.83 Modbus communication timeout

Address:	0x0E53	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	600	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–600 ms

Description

Set the Modbus communication timeout time.

H0E.84 Sequence of Modbus communication data bits

Address:	0x0E54	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time

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 Communication version

Address:	0x0E5A	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

Display the communication version.

8.16 H0F Fully Closed-Loop

H0F.00 **Encoder feedback mode**

Address:	0x0F00	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

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 and electronic gear ratio 1 are used.

DI function enabled: external encoder feedback and electronic gear ratio 2 are used.

H0F.01 **Fully closed-loop encoder application mode**

Address:	0x0F01	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

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 **Fully closed-loop encoder absolute value**

Address:	0x0F02	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Incremental mode
1: Absolute linear mode
Description
Set fully closed-loop encoder absolute value
0: Incremental mode
1: Absolute linear mode

H0F.03 **Fully closed-loop encoder feedback type**

Address:	0x0F03	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	4	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Quadrature pulse
1: Inovance
2: BiSS-C
3: EnDat2.2
4: SSI
Description
Set the fully closed-loop encoder feedback type
0: Quadrature pulse
1: Inovance
2: BiSS-C
3: EnDat2.2
4: SSI

H0F.04 **Number of fully closed-loop encoder pulses per revolution**

Address:	0x0F04	Effective mode:	Upon the next power-on
Min.:	1	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	10000	Change:	At stop

Value Range:

1 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.06 **Fully closed-loop encoder interface**

Address:	0x0F06	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: CN2

1: CN7

Description

Used to set the drive interface used by the fully closed-loop encoder.

0: CN2

1: CN7

H0F.08 Excessive deviation threshold in compound control mode

Address:	0x0F08	Effective mode:	Real-time
Min.:	0	Unit:	encoder unit
Max.:	2147483647	Data Type:	UInt32
Default:	1000	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the position deviation threshold at which the servo drive reports EB02.0 (Position deviation too large in fully closed-loop mode).

When H0F.08 is set to 0, the drive does not detect EB02.0 and always clears the fully closed-loop position deviation.

H0F.10 Clear deviation in compound control mode

Address:	0x0F0A	Effective mode:	Real-time
Min.:	0	Unit:	Rev
Max.:	100	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

0 Rev–100 Rev

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 operational state.

H0F.13 Compound vibration suppression filter time

Address:	0x0F0D	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 ms–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**

Address:	0x0F10	Effective mode:	-
Min.:	-2147483648	Unit:	encoder 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.
The alignment of inner and outer loop feedbacks is performed each time the deviation is cleared.

H0F.18 **Internal position pulse feedback display**

Address:	0x0F12	Effective mode:	-
Min.:	-2147483648	Unit:	encoder 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 **Fully closed-loop encoder position pulse feedback display**

Address:	0x0F14	Effective mode:	-
Min.:	-2147483648	Unit:	encoder 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 Quadrature pulse phase Z detection invalid in fully closed-loop mode

Address:	0x0F16	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Detected

1: Not detected

Description

Quadrature pulse phase Z detection in fully closed-loop mode

0: Detected

1: Not detected

H0F.23 BiSS-C/SSI/EDNAT2.2 fully closed-loop encoder absolute homing offset

Address:	0x0F17	Effective mode:	Real-time
Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

The homing offset is updated automatically after homing is done. It is only necessary to write this value manually when you replace the drive. When the full closed-loop encoder is in absolute linear mode, the power-on initial position = Encoder position feedback original value + Homing offset – Absolute feedback offset.

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

Address:	0x0F19	Effective mode:	Real-time
Min.:	0	Unit:	-

Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Motor Z signal

1: External feedback Z signal

Description

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

0: Motor Z signal

1: External feedback Z signal

H0F.26 BiSS-C/SSI/EDNAT2.2 fully closed-loop encoder absolute feedback offset

Address:	0x0F1A	Effective mode:	Real-time
Min.:	-2147483648	Unit:	encoder unit
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

When the full closed-loop encoder is in absolute linear mode, the absolute feedback offset is updated after homing is completed. It is only necessary to write this value manually when you replace the drive.

H0F.28 Index value of BiSS-C/SSI communication alarm

Address:	0x0F1C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Set the index value of BiSS-C/SSI communication alarm.

H0F.29 CRC of BiSS-C/SSI fully closed-loop encoder feedback

Address:	0x0F1D	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

0: Positive

1: Negative

Description

Set the CRC of BiSS-C/SSI fully closed-loop encoder feedback.

0: Positive

1: Negative

H0F.30 BiSS-C/SSl/EDNAT2.2 valid bits of encoder communication position feedback in full closed-loop mode

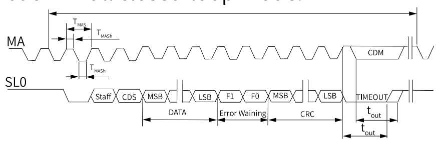
Address:	0x0F1E	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	127	Data Type:	UInt16
Default:	29	Change:	At stop

Value Range:

0 to 127

Description

Set the BiSS-C/SSl/EDNAT2.2 valid bits of encoder communication position feedback in full closed-loop mode.



- DATA: Position data, CRC: 6-digit CRC check code
- $100ns \leqslant T_{MAS} \leqslant 2t_{out} 25ns \leqslant T_{MASh} \leqslant t_{out} 25ns \leqslant T_{MASh} \leqslant t_{out}$
- t_{out}= 1.5 MA clock cycle
- MA: master clock output; SL0: slave data output Transmission speed up to 10 Mbps
- CDM: register communication master transmit bit; CDS: register communication slave return bit.
- Error Warning: Error bit and alarm bit index (F1 low level indicates an error, and F0 low level indicates an alarm)
- The input and output of the optical scale comply with the standard RS-422A interface. Differential line drive and line receiver are required.
- CRC generator polynomial: X6 + X1 + 1, initial value 0, check range "DATA", "Error Warning". In the figure, MA SL0 is not displayed.

H0F.30 is the valid bits of position feedback. For details, see the user manual of any third-party BiSS-C encoder.

H0F.31 Valid bit of BiSS-C/SSl encoder communication alarm index in full closed-loop mode

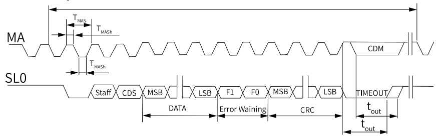
Address:	0x0F1F	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	31	Data Type:	UInt16
Default:	2	Change:	At stop

Value Range:

0 to 31

Description

Set the valid bit of BiSS-C/SSl encoder communication alarm index in full closed-loop mode.



- DATA: Position data, CRC: 6-digit CRC check code
- $100ns \leqslant T_{MAS} \leqslant 2t_{out} 25ns \leqslant T_{MASh} \leqslant t_{out} 25ns \leqslant T_{MASh} \leqslant t_{out}$
- t_{out}= 1.5 MA clock cycle
- MA: master clock output; SL0: slave data output Transmission speed up to 10 Mbps
- CDM: register communication master transmit bit; CDS: register communication slave return bit.
- Error Warning: Error bit and alarm bit index (F1 low level indicates an error, and F0 low level indicates an alarm)
- The input and output of the optical scale comply with the standard RS-422A interface. Differential line drive and line receiver are required.
- CRC generator polynomial: X6 + X1 + 1, initial value 0, check range "DATA", "Error Warning".

In the figure, MA SL0 is not displayed.

H0F.31: Error alarm set bit, error and alarm bit index. Its value is the difference between DATA and CRC.

H0F.32 BiSS-C/SSl/ENDAT encoder communication frequency in fully closed-loop mode

Address:	0x0F20	Effective mode:	Upon the next power-on
Min.:	0	Unit:	kHz
Max.:	10000	Data Type:	UInt16
Default:	2000	Change:	Real-time

Value Range:

0 kHz–10000 kHz

Description

Set the BiSS-C/SSl/ENDAT encoder communication frequency in fully closed-loop mode.

H0F.33 SSl/ENDAT encoder recovery time in fully closed-loop mode

Address:	0x0F21	Effective mode:	Upon the next power-on
Min.:	0.000	Unit:	μs
Max.:	40.000	Data Type:	UInt16
Default:	0.500	Change:	Real-time

Value Range:

0.000μs to 40.000μs

Description

Set the SSl/ENDAT encoder recovery time in fully closed-loop mode.

H0F.35 BiSS-C error detection enable in fully closed-loop mode

Address:	0x0F23	Effective mode:	Upon the next power-on

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

Value Range:

0: Disabled

1: Enabled

Description

Detection on error bits of BiSS-C protocol by FPGA software.

0: Disabled

1: Enabled

H0F.36 BiSS-C error bit polarity in fully closed-loop mode

Address:	0x0F24	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Positive

1: Negative

Description

BiSS-C error bit polarity

0: Positive

1: Negative

H0F.40 Fully closed-loop communication encoder fault info

Address:	0x0F28	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Display fault information of the fully closed-loop communication encoder.

Table 8–1 Inovance encoder

bit	Name
0	Full closed-loop serial encoder communication timeout (RX side[1])
1	Full closed-loop serial encoder frame stop bit error (RX side)
2	Full closed-loop serial encoder CRC error (RX side)[2]

bit	Name
3	Full closed-loop serial encoder data field error (RX side)
4	Full closed-loop serial encoder position count error (TX side[1])
5	Full closed-loop serial encoder frame overspeed (TX side)
6	Full closed-loop serial encoder over-temperature (TX side)
7	Full closed-loop serial encoder single-turn count error (TX side)
8	Full closed-loop serial encoder multi-turn count error (TX side)
9	Full closed-loop serial encoder battery alarm (TX side)
10	Full closed-loop serial encoder battery failure (TX side)
11 to 12	Undefined
13[3]	Full closed-loop serial encoder count increment error (algorithm[1])
14 to 15	Undefined
16 to 23	Full closed-loop serial encoder expansion data 1
24 to 31	Full closed-loop serial encoder expansion data 2

Table 8–2 EnDat encoder

bit	Name
0	EnDat encoder communication timeout (RX side)
1	EnDat level 1 fault (RX side)
2	EnDat encoder CRC error (RX side)[2]
3	EnDat level 2 fault (RX side)
4	EnDat fault information 1 (TX side)
5	EnDat fault information 2 (TX side)
6 to 8	Undefined
9	EnDat additional data 1 CRC error
10	EnDat additional data 2 CRC error
11 to 12	Undefined
13[3]	Full closed-loop serial encoder count increment error (algorithm)
14	EnDat level 3 fault (RX side)
15	EnDat level 3 fault (RX side)
16 to 23	Full closed-loop serial encoder expansion data 1
24 to 31	Full closed-loop serial encoder expansion data 2

Table 8–3 BiSS-C and SSI encoders

bit	Name
0	Full closed-loop serial encoder communication timeout (RX side)
1	Undefined
2	Full closed-loop serial encoder CRC error (RX side)[2]

bit	Name
3 to 10	Undefined
7	Full closed-loop serial encoder single-turn count error (TX side)
11 to 12	Undefined
13[3]	Full closed-loop serial encoder count increment error (algorithm)
14 to 15	Undefined
16 to 23[4]	Full closed-loop serial encoder expansion data 1
24 to 31[4]	Full closed-loop serial encoder expansion data 2

Note

[1]: In the above table, the RX side refers to the drive and the TX side refers to the motor encoder. The algorithm refers to the type of the indirect error caused by a direct error on the RX or TX side.

[2]: When a BiSS-C encoder is used: 1-CRC error; 0-CRC is normal. When an SSI encoder is used: 1-Parity error; 0-Parity is normal.

[3]: When H0A.50 or more data transmission errors occur continuously, bit13 will be set to 1 and the drive must be stopped. For other error types, you can stop the drive as needed.

[4]: Full closed-loop serial encoder extended data 1/2 (when a BiSS-C encoder is used): This part is the status word of BiSS-C and SSI encoders.

H0F.41 Inovance fully closed-loop encoder version

Address:	0x0F29	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Display the version number of the Inovance fully closed-loop encoder.

H0F.42 Inovance fully closed-loop encoder resolution

Address:	0x0F2A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Display the resolution of the Inovance fully closed-loop encoder.

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

Address:	0x0F2D	Effective mode:	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: Fully closed-loop positioning completed threshold 6067/Excessive position deviation threshold 6065 (scaled to outer loop unit)

1: Same threshold used for inner and outer loops

H0F.51 SSI encoder check bit selection in fully closed-loop mode

Address:	0x0F33	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: No check

1: Check applied

Description

Select the SSI encoder check bit in full closed-loop mode.

0: No check

1: Check applied

H0F.52 SSI encoder code system in full closed-loop mode

Address:	0x0F34	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Binary
1: Gray code

Description

Select the SSI encoder code system in full closed-loop mode.
0: Binary
1: Gray code

H0F.53 SSI encoder state word code system in fully closed-loop mode

Address:	0x0F35	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Binary
1: Gray code

Description

Select the SSI encoder status word code system in full closed-loop mode.
0: Binary
1: Gray code

H0F.54 SSI encoder parity check in fully closed-loop mode

Address:	0x0F36	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled
1: Enabled

Description

Enable/disable the SSI encoder parity check in fully closed-loop mode.
0: Disabled
1: Enabled

H0F.55 Fully closed-loop encoder communication timeout error count

Address:	0x0F37	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
Fully closed-loop encoder communication timeout error count

H0F.56 Encoder CRC error count in fully closed-loop mode

Address:	0x0F38	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
Encoder CRC error count in fully closed-loop mode

H0F.57 Fully closed-loop encoder communication frame stop bit error count.

Address:	0x0F39	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
Fully closed-loop encoder communication frame stop bit error count.

8.17 H17 Virtual DI/DO

H17.00 VDI1 function

Address:	0x1700	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI1.

H17.01 **VDI1 logic level selection**

Address:	0x1701	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI1 active level

H17.02 **VDI2 function**

Address:	0x1702	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI2.

H17.03 VDI2 logic level selection

Address:	0x1703	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI2 active level

H17.04 VDI3 function

Address:	0x1704	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI3.

H17.05 **VDI3 logic level selection**

Address:	0x1705	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI3 active level

H17.06 **VDI4 function**

Address:	0x1706	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI4.

H17.07 VDI4 logic level selection

Address:	0x1707	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI4 active level

H17.08 VDI5 function

Address:	0x1708	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI5.

H17.09 VDI5 logic level selection

Address:	0x1709	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI5 active level

H17.10 VDI6 function

Address:	0x170A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI6.

H17.11 VDI6 logic level selection

Address:	0x170B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI6 active level

H17.12 VDI7 function

Address:	0x170C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI7.

H17.13 VDI7 logic level selection

Address:	0x170D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI7 active level

H17.14 VDI8 function

Address:	0x170E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI8.

H17.15 VDI8 logic level selection

Address:	0x170F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI8 active level

H17.16 VDI9 function

Address:	0x1710	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI9.

H17.17 VDI9 logic level selection

Address:	0x1711	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI9 active level

H17.18 VDI10 function

Address:	0x1712	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI10.

H17.19 VDI10 logic level selection

Address:	0x1713	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI10 active level

H17.20 VDI11 function

Address:	0x1714	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI11.

H17.21 VDI11 logic level selection

Address:	0x1715	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI11 active level

H17.22 VDI12 function

Address:	0x1716	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI12.

H17.23 VDI12 logic level selection

Address:	0x1717	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI12 active level

H17.24 VDI13 function

Address:	0x1718	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI13.

H17.25 VDI13 logic level selection

Address:	0x1719	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI13 active level

H17.26 VDI14 function

Address:	0x171A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI14.

H17.27 VDI14 logic level selection

Address:	0x171B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI14 active level

H17.28 VDI15 function

Address:	0x171C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI15.

H17.29 VDI15 logic level selection

Address:	0x171D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI15 active level

H17.30 VDI16 function

Address:	0x171E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	56	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
3: Gain switchover
14: Positive limit switch
15: Negative limit switch
18: Forward jog
19: Reverse jog
24: Electronic gear Gear selection
31: Home switch
34: Emergency stop
35: Clear position deviation
56: External switch of the EEPOS program block

Description

Defines the function of VDI16.

H17.31 VDI16 logic level selection

Address:	0x171F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Active when the written value is 1
1: Active when the written value changes from 0 to 1

Description

Set VDI16 active level

H17.32 VDO virtual level

Address:	0x1720	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Display the VDO virtual level.

H17.33 VDO1 function

Address:	0x1721	Effective mode:	Real-time
Min.:	0	Unit:	-

Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

Set the function of VDO1.

H17.34 VDO1 logic level selection

Address:	0x1722	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

Set VDO1 active level.

H17.35 VDO2 function

Address:	0x1723	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

See H17.33.

H17.36 **VDO2 logic level selection**

Address:	0x1724	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

See H17.34.

H17.37 **VDO3 function**

Address:	0x1725	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

See H17.33.

H17.38 VDO3 logic level selection

Address:	0x1726	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.39 VDO4 function

Address:	0x1727	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.40 VDO4 logic level selection

Address:	0x1728	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.41 VDO5 function

Address:	0x1729	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.42 VDO5 logic level selection

Address:	0x172A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.43 VDO6 function

Address:	0x172B	Effective mode:	Real-time

Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.44 VDO6 logic level selection

Address:	0x172C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.45 VDO7 function

Address:	0x172D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

See H17.33.

H17.46 **VDO7 logic level selection**

Address:	0x172E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

See H17.34.

H17.47 **VDO8 function**

Address:	0x172F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

See H17.33.

H17.48 VDO8 logic level selection

Address:	0x1730	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.49 VDO9 function

Address:	0x1731	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.50 VDO9 logic level selection

Address:	0x1732	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:
0: Output 1 upon active logic
1: Output 0 upon active logic
Description
See H17.34.

H17.51 VDO10 function

Address:	0x1733	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:
0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output
Description
See H17.33.

H17.52 VDO10 logic level selection

Address:	0x1734	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:
0: Output 1 upon active logic
1: Output 0 upon active logic
Description
See H17.34.

H17.53 VDO11 function

Address:	0x1735	Effective mode:	Real-time

Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.54 VDO11 logic level selection

Address:	0x1736	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.55 VDO12 function

Address:	0x1737	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

See H17.33.

H17.56 VDO12 logic level selection

Address:	0x1738	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic
1: Output 0 upon active logic

Description

See H17.34.

H17.57 VDO13 function

Address:	0x1739	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition
1: Servo ready
9: Brake output signal
10: Warning
11: Fault
16: Homing completed
21: Enabled
26: Fully closed-lo op state
30: Alarm or fault output
32: EDM output

Description

See H17.33.

H17.58 VDO13 logic level selection

Address:	0x173A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.59 VDO14 function

Address:	0x173B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.60 VDO14 logic level selection

Address:	0x173C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.61 VDO15 function

Address:	0x173D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.62 VDO15 logic level selection

Address:	0x173E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.63 VDO16 function

Address:	0x173F	Effective mode:	Real-time

Min.:	0	Unit:	-
Max.:	32	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No definition

1: Servo ready

9: Brake output signal

10: Warning

11: Fault

16: Homing completed

21: Enabled

26: Fully closed-lo op state

30: Alarm or fault output

32: EDM output

Description

See H17.33.

H17.64 VDO16 logic level selection

Address:	0x1740	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Output 1 upon active logic

1: Output 0 upon active logic

Description

See H17.34.

H17.90 Communication VDI enable

Address:	0x175A	Effective mode:	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 after power-on**

Address:	0x175B	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:
bit0: VDI1
bit1: VDI2
bit2: VDI3
bit3: VDI4
bit4: VDI5
bit5: VDI6
bit6: VDI7
bit7: VDI8
bit8: VDI9
bit9: VDI10
bit10: VDI11
bit11: VDI12
bit12: VDI13
bit13: VDI14
bit14: VDI15
bit15: VDI16

Description
Configures the initial value of VDI upon power-on.
Bit 0 corresponds to VDI1.
Bit 1 corresponds to VDI2.
…
Bit 15 corresponds to VDI16.

H17.92 **Communication VDO enable**

Address:	0x175C	Effective mode:	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. Set H17.92 to enable VDO.
2. Set the default level after power-on through H17.93.
3. Set the DO function of the VDO terminal through parameters in group H17.

4: Read the output level of the VDO in H17.32.

H17.93 **VDO default value after power-on**

Address:	0x175D	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	At stop

Value Range:

bit0: VDO1

bit1: VDO2

bit2: VDO3

bit3: VDO4

bit4: VDO5

bit5: VDO6

bit6: VDO7

bit7: VDO8

bit8: VDO9

bit9: VDO10

bit10: VDO11

bit11: VDO12

bit12: VDO13

bit13: VDO14

bit14: VDO15

bit15: VDO16

Description

Configures the initial value of VDO upon power-on.

Bit 0 corresponds to VDO1.

Bit 1 corresponds to VDO2.

…

Bit 15 corresponds to VDO16.

8.18 H18 Position Comparison Output

H18.00 **Position comparison output selection**

Address:	0x1800	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disable

1: Enable (rising edge-triggered)

Description

0: Disable

1: Enable (rising edge-triggered)

H18.01 **Position comparison output feedback source**

Address:	0x1801	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Motor encoder feedback

1: Fully closed-loop position feedback

Description

Select position comparison output feedback source.

0: Motor encoder feedback

1: Fully closed-loop position feedback

H18.02 **Position comparison resolution**

Address:	0x1802	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	7	Data Type:	UInt16
Default:	1	Change:	Real-time

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

Set 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

H18.03 Position comparison mode

Address:	0x1803	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Individual comparison mode
1: Cyclic comparison mode
2: Fixed cyclic comparison mode

Description

Set position comparison mode
0: Individual comparison mode
1: Cyclic comparison mode
2: Fixed cyclic comparison mode

H18.04 Current position as zero

Address:	0x1804	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: Disable
1: Enable (rising edge-triggered)
Description
Current position as zero

H18.05 **Position comparison output width**

Address:	0x1805	Effective mode:	Real-time
Min.:	0.1	Unit:	ms
Max.:	204.7	Data Type:	UInt16
Default:	0.1	Change:	Real-time

Value Range:
0.1 ms–204.7 ms
Description
Defines the active pulse width of the DO when the comparison point is reached. The value range is 0 to 204.7 (unit: 1 ms).

H18.06 **Position comparison output ABZ port polarity**

Address:	0x1806	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:
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
Description
0: Positive (output high level upon active logic) 1: Negative (output high level upon active logic)
bit0: OCZ output logic
Bit1: Z output logic
Bit2: A/B output logic

H18.07 Position comparison start point

Address:	0x1807	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	40	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1 to 40

Description

Set position comparison start point.

H18.08 Position comparison end point

Address:	0x1808	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	40	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1 to 40

Description

Set position comparison end point.

H18.09 Current state of position comparison

Address:	0x1809	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1024	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 1024

Description

Display current state of position comparison.

H18.10 Real-time position of position comparison

Address:	0x180A	Effective mode:	-
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Display the real-time position of position comparison.

H18.12 Zero offset of position comparison

Address:	0x180C	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

Set the zero offset of position comparison.

H18.14 Position comparison output delay compensation

Address:	0x180E	Effective mode:	Upon the next power-on
Min.:	-12.00	Unit:	μs
Max.:	12.00	Data Type:	Int16
Default:	0.00	Change:	Real-time

Value Range:

-12.00μs to 12.00μs

Description

Compensates the delay caused by hardware signal output.

H18.15 Fixed cyclic comparison

Address:	0x180F	Effective mode:	Real-time
Min.:	1	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1 to 65535

Description

Set fixed cyclic comparison.

H18.16 ABZ output function setting

Address:	0x1810	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Real-time

Value Range:

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

Description

Set ABZ output function.

bit0: OCZ (0: Frequency-division output; 1: Position comparison)

bit1: Z (0: Frequency-division output; 1: Position comparison)

bit2: A/B (0: Frequency-division output; 1: Position comparison)

H18.17 **Number of fixed mode cycles**

Address:	0x1811	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Set the number of fixed mode cycles.

8.19 H19 Target Position Parameters

H19.00 **Target value of position comparison 1**

Address:	0x1900	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

Set the target value of position comparison 1.

H19.02 Attribute value of position comparison 1

Address:	0x1902	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

Attribute setting of position comparison point 1
Bit0: 1: Current position changes from "less than" to "more than" the comparison point; 0: N/A
Bit0: 1: Current position changes from "more than" to "less than" the comparison point; 0: N/A
Bit2 to bit6: NA
Bit7: 1: DO1 output enabled; 0: N/A
Bit8: 1: DO2 output enabled; 0: N/A
Bit9 to bit11: N/A
Bit12: 1: Frequency-division A output enabled; 0: N/A
Bit13: 1: Frequency-division B output enabled; 0: N/A
Bit14: 1: Frequency-division C output enabled; 0: N/A
Bit15: 1: Frequency-division OCZ output enabled; 0: N/A

H19.03 **Target value of position comparison 2**

Address:	0x1903	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.05 **Attribute value of position comparison 2**

Address:	0x1905	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.06 **Target value of position comparison 3**

Address:	0x1906	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.08 **Attribute value of position comparison 3**

Address:	0x1908	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.09 Target value of position comparison 4

Address:	0x1909	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.11 Attribute value of position comparison 4

Address:	0x190B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

See H19.02.

H19.12 Target value of position comparison 5

Address:	0x190C	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.14 Attribute value of position comparison 5

Address:	0x190E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

See H19.02.

H19.15 **Target value of position comparison 6**

Address:	0x190F	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.17 **Attribute value of position comparison 6**

Address:	0x1911	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.18 **Target value of position comparison 7**

Address:	0x1912	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.20 **Attribute value of position comparison 7**

Address:	0x1914	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.21 Target value of position comparison 8

Address:	0x1915	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.23 Attribute value of position comparison 8

Address:	0x1917	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.24 Target value of position comparison 9

Address:	0x1918	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.26 Attribute value of position comparison 9

Address:	0x191A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.27 Target value of position comparison 10

Address:	0x191B	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.29 Attribute value of position comparison 10

Address:	0x191D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.30 **Target value of position comparison 11**

Address:	0x191E	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.32 **Attribute value of position comparison 11**

Address:	0x1920	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.33 Target value of position comparison 12

Address:	0x1921	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.35 Attribute value of position comparison 12

Address:	0x1923	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

See H19.02.

H19.36 Target value of position comparison 13

Address:	0x1924	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.38 Attribute value of position comparison 13

Address:	0x1926	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.39 **Target value of position comparison 14**

Address:	0x1927	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.41 **Attribute value of position comparison 14**

Address:	0x1929	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

See H19.02.

H19.42 Target value of position comparison 15

Address:	0x192A	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.44 Attribute value of position comparison 15

Address:	0x192C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.45 Target value of position comparison 16

Address:	0x192D	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.47 Attribute value of position comparison 16

Address:	0x192F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.48 **Target value of position comparison 17**

Address:	0x1930	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.50 **Attribute value of position comparison 17**

Address:	0x1932	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.51 **Target value of position comparison 18**

Address:	0x1933	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.53 **Attribute value of position comparison 18**

Address:	0x1935	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.54 Target value of position comparison 19

Address:	0x1936	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.56 Attribute value of position comparison 19

Address:	0x1938	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.57 Target value of position comparison 20

Address:	0x1939	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.59 Attribute value of position comparison 20

Address:	0x193B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

See H19.02.

H19.60 Target value of position comparison 21

Address:	0x193C	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.62 Attribute value of position comparison 21

Address:	0x193E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.63 Target value of position comparison 22

Address:	0x193F	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.65 Attribute value of position comparison 22

Address:	0x1941	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.66 Target value of position comparison 23

Address:	0x1942	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.68 Attribute value of position comparison 23

Address:	0x1944	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.69 **Target value of position comparison 24**

Address:	0x1945	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.71 **Attribute value of position comparison 24**

Address:	0x1947	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.72 Target value of position comparison 25

Address:	0x1948	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.74 Attribute value of position comparison 25

Address:	0x194A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.75 Target value of position comparison 26

Address:	0x194B	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.77 Attribute value of position comparison 26

Address:	0x194D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point
bit1: Current position changes from "more than" to "less than" the comparison point
bit2: N/A
bit3: N/A
bit4: N/A
bit5: N/A
bit6: N/A
bit7: DO1 output
bit8: DO2 output
bit9: N/A
bit10:
bit10: N/A
bit11: N/A
bit12: Frequency-division A output
bit13: Frequency-division B output
bit14: Frequency-division Z output
bit15: Frequency-division OCZ output

Description

See H19.02.

H19.78 Target value of position comparison 27

Address:	0x194E	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.80 Attribute value of position comparison 27

Address:	0x1950	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.81 Target value of position comparison 28

Address:	0x1951	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.83 Attribute value of position comparison 28

Address:	0x1953	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.84 Target value of position comparison 29

Address:	0x1954	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.86 Attribute value of position comparison 29

Address:	0x1956	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.87 Target value of position comparison 30

Address:	0x1957	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.89 Attribute value of position comparison 30

Address:	0x1959	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.90 Target value of position comparison 31

Address:	0x195A	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.92 Attribute value of position comparison 31

Address:	0x195C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.93 **Target value of position comparison 32**

Address:	0x195D	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.95 **Attribute value of position comparison 32**

Address:	0x195F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.96 **Target value of position comparison 33**

Address:	0x1960	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.98 **Attribute value of position comparison 33**

Address:	0x1962	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.99 **Target value of position comparison 34**

Address:	0x1963	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.101 **Attribute value of position comparison 34**

Address:	0x1965	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.102 Target value of position comparison 35

Address:	0x1966	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.104 Attribute value of position comparison 35

Address:	0x1968	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.105 Target value of position comparison 36

Address:	0x1969	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.107 Attribute value of position comparison 36

Address:	0x196B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.108 Target value of position comparison 37

Address:	0x196C	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.110 Attribute value of position comparison 37

Address:	0x196E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.111 Target value of position comparison 38

Address:	0x196F	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.113 Attribute value of position comparison 38

Address:	0x1971	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.114 Target value of position comparison 39

Address:	0x1972	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.116 Attribute value of position comparison 39

Address:	0x1974	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

H19.117 Target value of position comparison 40

Address:	0x1975	Effective mode:	Real-time
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648 to 2147483647

Description

See H19.00.

H19.119 Attribute value of position comparison 40

Address:	0x1977	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Current position changes from "less than" to "more than" the comparison point

bit1: Current position changes from "more than" to "less than" the comparison point

bit2: N/A

bit3: N/A

bit4: N/A

bit5: N/A

bit6: N/A

bit7: DO1 output

bit8: DO2 output

bit9: N/A

bit10:

bit10: N/A

bit11: N/A

bit12: Frequency-division A output

bit13: Frequency-division B output

bit14: Frequency-division Z output

bit15: Frequency-division OCZ output

Description

See H19.02.

8.20 H21 Current Loop Gain Switchover Parameters

H21.00 **Current loop gain switchover**

Address:	0x2100	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No operation

1: Enabled

Description

Used to enable or disable the current loop gain switchover function.

0: No operation, turned off

1: Enabled, turned on

8.21 H24 PN Bus Communication Parameters

H24.00 **Telegram number selection [PN922]**

Address:	0x2400	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	3	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the telegram sent and received and receives the telegram set by the host controller.

H24.01 **Heartbeat warning threshold [PN925]**

Address:	0x2401	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	5	Change:	At stop

Value Range:

0 to 65535

Description

Defines the number of heartbeat errors that can occur continuously on the isochronous real-time master station.

H24.02 **Fault message counter [PN944]**

Address:	0x2402	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the counter of the fault buffer.

H24.03 **Fault code [PN947]**

Address:	0x2403	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Displays the number of the fault.

H24.04 **Fault No.**

Address:	0x2404	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	63	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 63

Description

Displays the fault serial number.

H24.05 **Fault condition counter [PN952]**

Address:	0x2405	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Number of faults after the last reset.

H24.06 Sensor header [PN979[0]]

Address:	0x2406	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x5112	Change:	Unchangeable

Value Range:

0x0 to 0xFFFFFFFF

Description

Displays the sensor header [PN979[0]].

H24.08 Sensor type [PN979[1]]

Address:	0x2408	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x80000002	Change:	Unchangeable

Value Range:

0x0 to 0xFFFFFFFF

Description

Displays the sensor type [PN979[1]].

H24.10 Sensor resolution [PN979[2]]

Address:	0x240A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	256	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the sensor resolution [PN979[2]].

H24.12 Sensor G1_X1ST1 displacement factor [PN979[3]]

Address:	0x240C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32

Default:	15	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the Sensor G1_X1ST1 displacement factor [PN979[3]].

H24.14 Sensor G1_X1ST2 displacement factor [PN979[4]]

Address:	0x240E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	15	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the Sensor G1_X1ST2 displacement factor [PN979[4]].

H24.16 Sensor multi-turn number [PN979[5]]

Address:	0x2410	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	512	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Displays the sensor multi-turn number [PN979[5]].

H24.19 Synchronization cycle

Address:	0x2413	Effective mode:	-
Min.:	0.000	Unit:	ms
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 ms–65.535 ms

Description

Displays the synchronization period.

H24.22 IP address

Address:	0x2416	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0xC0A80002	Change:	Unchangeable

Value Range:

0x0 to 0xFFFFFFFF

Description

Displays the IP address.

H24.24 Subnet mask

Address:	0x2418	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0xFFFFFF00	Change:	Unchangeable

Value Range:

0x0 to 0xFFFFFFFF

Description

Displays the subnet mask.

H24.26 Default gateway

Address:	0x241A	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFFFFFF

Description

Displays the default gateway.

H24.32 Telegram 105 configuration

Address:	0x2420	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0x3	Data Type:	UInt16
Default:	0x3	Change:	At stop

Value Range:

Bit0: Enable PLC position loop gain when DSC is on	Bit0 = 0: Local gain enabled Bit0 = 1: PLC gain enabled
Bit1: NSOLL_B enabled	Bit1 = 0: Disabled Bit1 = 1: Enabled

Description

Telegram 105 configuration

bit0: Enable PLC position loop gain when DSC is on

Bit1: NSOLL_B enabled

Note: When DSC is enabled in Telegram 105, NSOLL_B is used as the speed feedforward; when DSC is not enabled, NSOLL_B is used as the speed reference.

H24.33 Number of Sync with advanced DSC position feedback

Address:	0x2421	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	16	Data Type:	UInt16
Default:	2	Change:	Real-time

Value Range:

0 to 16

Description

Set the number of Sync with advanced DSC position feedback.

H24.34 DSC control word (DSC_STW)

Address:	0x2422	Effective mode:	Real-time
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Real-time

Value Range:

Bit0: DSC with spline enabled	Bit0 = 0: Disabled Bit0 = 1: Enabled
Bit4: Speed feedforward enabled in DSC with spline	Bit0 = 0: Disabled Bit4 = 1: Enabled
Bit5: Torque feedforward enabled in DSC with spline	Bit5 = 0: Disabled Bit5 = 1: Enabled

Description

DSC control word, setting the DSC interpolation mode
Bit0: DSC with spline enabled
Bit4: Speed feedforward enabled in DSC with spline
Bit5: Torque feedforward enabled in DSC with spline
Note: When spline interpolation is enabled, check that the following conditions are fulfilled. Failure to comply will result in vibration and runaway.
1. Process object configuration: Position control in the drive device is enabled (DSC is enabled), PLC pre-control is set to 100%, and the revolution number control circuit substitution time is set to 0.
2. MC_POWER and MC_MOVEJOG are configured to the position control mode (position controlled axis).
3. H24.33 is configured properly.

H24.35 Customized telegram 850 transmission

Address:	0x2423	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No assignment
1: VDO
2: External DI state

Description

Select the data sent by the servo drive to the PLC by means of additive telegram 850.
0: No assignment
1: VDO
2: External DI state

H24.36 Customized receive of telegram 850

Address:	0x2424	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No assignment
1: VDI
2: External DO state

Description

Select the data sent by the PLC to the servo drive by means of additive telegram 850.

0: No assignment

1: VDI

2: External DO state

H24.37 **Extra telegram**

Address:	0x2425	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	999	Data Type:	UInt16
Default:	999	Change:	At stop

Value Range:

0 to 999

Description

Displays the current additive telegram symbol. 999 indicates that there is no additive telegram.

H24.38 **Customized receive word**

Address:	0x2426	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No function

1: Additive torque

2: Forced DO

Description

It is the user-defined data sent by the PLC to the servo drive through telegram 111.

H24.39 **Customized transmit word**

Address:	0x2427	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0: No function
1: Actual torque
2: Actual current
3: DI state

Description

It is the user-defined data sent by the servo drive to the PLC through telegram 111.

H24.41 Device name loss warning selection

Address:	0x2429	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 1

Description

When it is enabled and if the device name is lost, E18.0 is reported.

H24.42 Number of consecutive loss detections

Address:	0x242A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	8	Change:	At stop

Value Range:

0 to 65535

Description

Set the number of consecutive loss detections.

H24.44 FPGA synchronous detection deviation threshold

Address:	0x242C	Effective mode:	Real-time
Min.:	0	Unit:	ns
Max.:	65535	Data Type:	UInt16
Default:	3000	Change:	At stop

Value Range:

0 ns–65535 ns

Description

Set the FPGA synchronous detection deviation threshold.

H24.45 **MAC address**

Address:	0x242D	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Displays the MAC address.

H24.46 **MAC address**

Address:	0x242E	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Displays the MAC address.

H24.47 **MAC address**

Address:	0x242F	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Displays the MAC address.

H24.49 **PN disconnection fault code**

Address:	0x2431	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the PN disconnection fault code.

H24.50 Acceleration time of AC1AC4 ramp generator

Address:	0x2432	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	655350	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 ms–655350 ms

Description

AC1AC4, the ramp time for speed reference to accelerate from 0 rpm to the rated speed. It is recommended to set it to 0 when the AC4 and PLC are closed-looped.

H24.52 Deceleration time of AC1AC4 ramp generator

Address:	0x2434	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	655350	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 ms–655350 ms

Description

AC1AC4, indicates the ramp time for the speed reference to decelerate from the rated speed to 0 rpm. It is recommended to set it to 0 when the AC4 and PLC are closed-looped.

H24.54 Speed reference filter time

Address:	0x2436	Effective mode:	Real-time
Min.:	0.0	Unit:	ms
Max.:	100.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0 ms–100.0 ms

Description

Defines the speed reference average filter time.

H24.55 **DSC maximum Kv coefficient estimation**

Address:	0x2437	Effective mode:	-
Min.:	0.0	Unit:	1/s
Max.:	6553.5	Data Type:	UInt16
Default:	0.0	Change:	Unchangeable

Value Range:

0.0/s to 6553.5/s

Description

It is recommended that the KV gain be set for the PLC in the DSC average interpolation mode.

Note: The gain Kv (factor) of the process object is H24.55.

H24.56 **DSC symmetrical time constant estimation**

Address:	0x2438	Effective mode:	-
Min.:	0.00	Unit:	ms
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 ms–655.35 ms

Description

It is recommended to set the revolution control substitution time for the PLC in the DSC average interpolation mode.

Note: The revolution control substitution time for the process object is H24.56 × 0.001 (s).

H24.57 **Ti**

Address:	0x2439	Effective mode:	-
Min.:	0.000	Unit:	ms
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 ms–65.535 ms

Description

Displays the Ti time of synchronization mode.

H24.58 **To**

Address:	0x243A	Effective mode:	-
Min.:	0.000	Unit:	ms

Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 ms–65.535 ms

Description

Displays the To time of synchronization mode.

H24.59 **Safety telegram No. selection**

Address:	0x243B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the safety telegram sent and received and receives the safety telegram set by the host controller.

H24.60 **PN Function Selection**

Address:	0x243C	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

Bit0-1: PN fault channel upload scheme

0: Upload drive local fault code to host controller

1: Upload by 20 fault types according to PN rules

2: Do not upload

Bit2: Internal switch

0: Internal switch

1: Internal switch

Bit 3: Customized PN reference speed switch

0: H24.64 and H00.14 are forcibly bound

1: H24.64 can be customized

Bit4: Hide AE19.7 unsupported overtravel stop

0: Not hide

1: Hide

Description

Defines the PN function.

Bit0-1: PN fault channel upload scheme

0: Upload drive local fault code to host controller

1: Upload by 20 fault types according to PN rules

2: Do not upload

Bit2: Internal switch

0: Internal switch

1: Internal switch

Bit 3: Customized PN reference speed switch

0: H24.64 and H00.14 are forcibly bound

1: H24.64 can be customized

Bit4: Hide AE19.7 unsupported overtravel stop

0: Not hide

1: Hide

H24.64 **Reference speed**

Address:	0x2440	Effective mode:	Real-time
Min.:	1.000	Unit:	rpm
Max.:	10000.000	Data Type:	UInt32
Default:	3000.000	Change:	At stop

Value Range:

1.000rpm to 10000.000rpm

Description

The speed parameter of PN telegram exchange is a percentage of reference speed. Telegram 1 uses 0x4000 as 100% and other telegrams use 0x40000000 as 100%. The maximum value is 200%. The percentage multiplied by the reference speed is the speed setpoint or feedback speed. When bit3 of H24.60 is set to 0, this parameter is forcibly written as the value of H00.14. When bit3 of H24.60 is set to 1, it can be modified freely.

8.22 H25 AC3 Control Parameters

H25.00 **EPOS max. speed**

Address:	0x2500	Effective mode:	Real-time
Min.:	0	Unit:	1000 LU/min
Max.:	40000000	Data Type:	UInt32
Default:	30000	Change:	Real-time

Value Range:

0 LU/min.–40000000 LU/min.

Description

AC1AC4, indicates the ramp time for the speed reference to decelerate from the rated speed to 0 rpm. It is recommended to set it to 0 when the AC4 and PLC are closed-looped.

H25.02 EPOS max. acceleration

Address:	0x2502	Effective mode:	Real-time
Min.:	1	Unit:	1000 LU/s/s
Max.:	2000000	Data Type:	UInt32
Default:	100	Change:	Real-time

Value Range:

1 LU/s/s–2000000 LU/s/s

Description

EPOS max. acceleration.

"Running program block" operation mode:

The acceleration override (H27.81 to H27.96) set by the program block is coupled with this parameter to make the acceleration effective.

"MDI" operation mode:

Acceleration override effective (H29.16, 0x4000 = 100%) is coupled with this parameter to make the acceleration effective.

"Jog" running mode:

No acceleration override effective. The axis is started with the maximum acceleration.

"Return to reference point" operation mode:

The homing acceleration/deceleration override (H25.27) is coupled to this parameter to make the acceleration effective.

H25.04 EPOS max. deceleration

Address:	0x2504	Effective mode:	Real-time
Min.:	1	Unit:	1000 LU/s/s
Max.:	2000000	Data Type:	UInt32
Default:	100	Change:	Real-time

Value Range:

1 LU/s/s–2000000 LU/s/s

Description

EPOS max. deceleration.

"Running program block" operation mode:

The deceleration override (H28.00 to H28.15) set by the program block is coupled with this parameter to make the deceleration effective.

"MDI" operation mode:

Acceleration override effective (H29.17, 0x4000 = 100%) is coupled with this parameter to make the deceleration effective.

"Jog" running mode:

No acceleration override effective. The axis is started with the minimum acceleration.

"Return to reference point" operation mode:

The homing acceleration/deceleration override (H25.27) is coupled to this parameter to make the deceleration effective.

H25.06 EPOS ramp deceleration

Address:	0x2506	Effective mode:	Real-time
Min.:	1	Unit:	1000 LU/s/s
Max.:	2000000	Data Type:	UInt32
Default:	100	Change:	Real-time

Value Range:

1 LU/s/s–2000000 LU/s/s

Description

During EPOS running, it triggers the negative task to take effect.

H25.10 EPOS positioning reach threshold

Address:	0x250A	Effective mode:	Real-time
Min.:	0	Unit:	LU
Max.:	2147483647	Data Type:	UInt32
Default:	7	Change:	Real-time

Value Range:

0LU to 2147483647LU

Description

Position reach threshold in EPOS relative or absolute positioning mode.

H25.12 EPOS positioning reached window time

Address:	0x250C	Effective mode:	Real-time
Min.:	0	Unit:	ms

Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 ms–2147483647 ms

Description

Indicates the positioning window time of the relative or absolute positioning mode.

H25.14 EPOS-Jog1 speed

Address:	0x250E	Effective mode:	Real-time
Min.:	-40000000	Unit:	1000 LU/min
Max.:	40000000	Data Type:	Int32
Default:	-300	Change:	Real-time

Value Range:

-40000000 Lu/min to 40000000 LU/min

Description

Jog1 speed setpoint of EEPOS mode 7 or modes 8.

H25.16 EPOS-Jog2 speed

Address:	0x2510	Effective mode:	Real-time
Min.:	-40000000	Unit:	1000 LU/min
Max.:	40000000	Data Type:	Int32
Default:	300	Change:	Real-time

Value Range:

-40000000 Lu/min to 40000000 LU/min

Description

Jog2 speed setpoint of EEPOS mode 7 or modes 8.

H25.18 EPOS-JOG1 position increment

Address:	0x2512	Effective mode:	Real-time
Min.:	0	Unit:	LU
Max.:	2147483647	Data Type:	UInt32
Default:	1000	Change:	Real-time

Value Range:

0LU to 2147483647LU

Description

Jog1 position increment setpoint of EEPOS mode 8.

H25.20 EPOS-JOG2 position increment

Address:	0x2514	Effective mode:	Real-time
Min.:	0	Unit:	LU
Max.:	2147483647	Data Type:	UInt32
Default:	1000	Change:	Real-time

Value Range:

0LU to 2147483647LU

Description

Jog2 position increment setpoint of EEPOS mode 8.

H25.22 Homing type

Address:	0x2516	Effective mode:	Real-time
Min.:	-2	Unit:	-
Max.:	35	Data Type:	Int16
Default:	0	Change:	Real-time

Value Range:

-2 to 35

Description

Homing trajectory selection.

H25.23 Homing high speed

Address:	0x2517	Effective mode:	Real-time
Min.:	0	Unit:	1000 LU/min
Max.:	40000000	Data Type:	UInt32
Default:	5000	Change:	Real-time

Value Range:

0 LU/min.–40000000 LU/min.

Description

Indicates the speed setpoint during high-speed running.

H25.25 Homing low speed

Address:	0x2519	Effective mode:	Real-time
Min.:	0	Unit:	1000 LU/min
Max.:	40000000	Data Type:	UInt32
Default:	300	Change:	Real-time

Value Range:

0 LU/min.–40000000 LU/min.

Description

Indicates the speed setpoint during low-speed running.

H25.27 Homing acceleration/deceleration override

Address:	0x251B	Effective mode:	Real-time
Min.:	0.01	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

0.01% to 100.00%

Description

Indicates the acceleration/deceleration override for homing.

H25.28 EPOS acceleration/deceleration determination sampling interval

Address:	0x251C	Effective mode:	Real-time
Min.:	0	Unit:	ms
Max.:	1500	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 ms–1500 ms

Description

Increasing the interval prevents the acceleration and deceleration flag in the status word from being abnormal, but also causes delay.

8.23 H27 Program Block Parameters

H27.00 Current block

Address:	0x2700	Effective mode:	-
Min.:	0	Unit:	-
Max.:	15	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 15

Description

Indicates the block number of the currently running block. It is displayed as 0 when no block is running.

H27.01 **Block 0 task**

Address:	0x2701	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.02 **Block 1 task**

Address:	0x2702	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.03 **Block 2 task**

Address:	0x2703	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:
1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O
Description
Select the task type of the program block.

H27.04 **Block 3 task**

Address:	0x2704	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:
1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O
Description
Select the task type of the program block.

H27.05 **Block 4 task**

Address:	0x2705	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.06 **Block 5 task**

Address:	0x2706	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.07 **Block 6 task**

Address:	0x2707	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.08 **Block 7 task**

Address:	0x2708	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.09 **Block 8 task**

Address:	0x2709	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.10 **Block 9 task**

Address:	0x270A	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.11 **Block 10 task**

Address:	0x270B	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.12 **Block 11 task**

Address:	0x270C	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.13 **Block 12 task**

Address:	0x270D	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.14 **Block 13 task**

Address:	0x270E	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.15 **Block 14 task**

Address:	0x270F	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.16 Block 15 task

Address:	0x2710	Effective mode:	At stop
Min.:	1	Unit:	-
Max.:	8	Data Type:	UInt16
Default:	1	Change:	Real-time

Value Range:

1: Positioning
2: Fixed stopper
3: Forward cycle
4: Reverse cycle
5: Waiting
6: Switching
7: Setting O
8: Resetting O

Description

Select the task type of the program block.

H27.17 Position of block 0

Address:	0x2711	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.19 **Position of block 1**

Address:	0x2713	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.21 **Position of block 2**

Address:	0x2715	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.23 **Position of block 3**

Address:	0x2717	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.25 **Position of block 4**

Address:	0x2719	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.27 Position of block 5

Address:	0x271B	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.29 Position of block 6

Address:	0x271D	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.31 Position of block 7

Address:	0x271F	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.33 **Position of block 8**

Address:	0x2721	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.35 **Position of block 9**

Address:	0x2723	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.37 **Position of block 10**

Address:	0x2725	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.39 **Position of block 11**

Address:	0x2727	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.41 **Position of block 12**

Address:	0x2729	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.43 **Position of block 13**

Address:	0x272B	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.45 **Position of block 14**

Address:	0x272D	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.47 Position of block 15

Address:	0x272F	Effective mode:	At stop
Min.:	-2147483648	Unit:	LU
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Real-time

Value Range:

-2147483648LU to 2147483647LU

Description

Defines the position setting value of the program block positioning or stopper fixing task.

H27.49 Block 0 speed

Address:	0x2731	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.51 Block 1 speed

Address:	0x2733	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.53 Block 2 speed

Address:	0x2735	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32

Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.55 Block 3 speed

Address:	0x2737	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.57 Block 4 speed

Address:	0x2739	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.59 Block 5 speed

Address:	0x273B	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.61 **Block 6 speed**

Address:	0x273D	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.63 **Block 7 speed**

Address:	0x273F	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.65 **Block 8 speed**

Address:	0x2741	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.67 Block 9 speed

Address:	0x2743	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.69 Block 10 speed

Address:	0x2745	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.71 Block 11 speed

Address:	0x2747	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.73 Block 12 speed

Address:	0x2749	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32

Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.75 Block 13 speed

Address:	0x274B	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.77 Block 14 speed

Address:	0x274D	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.79 Block 15 speed

Address:	0x274F	Effective mode:	At stop
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	600	Change:	Real-time

Value Range:

0 Lu/min–4294967295 LU/min

Description

Defines the speed setpoint of the program block positioning, looping, and fixed stopper tasks.

H27.81 **Block 0 acc. override**

Address:	0x2751	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.82 **Block 1 acc. override**

Address:	0x2752	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

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H27.83 **Block 2 acc. override**

Address:	0x2753	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.84 **Block 3 acc. override**

Address:	0x2754	Effective mode:	At stop

Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:
1.00% to 100.00%

Description
Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.85 **Block 4 acc. override**

Address:	0x2755	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:
1.00% to 100.00%

Description
Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.86 **Block 5 acc. override**

Address:	0x2756	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:
1.00% to 100.00%

Description
Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.87 **Block 6 acc. override**

Address:	0x2757	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:
1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.88 **Block 7 acc. override**

Address:	0x2758	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.89 **Block 8 acc. override**

Address:	0x2759	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.90 **Block 9 acc. override**

Address:	0x275A	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.91 **Block 10 acc. override**

Address:	0x275B	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.92 **Block 11 acc. override**

Address:	0x275C	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.93 **Block 12 acc. override**

Address:	0x275D	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.94 **Block 13 acc. override**

Address:	0x275E	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.95 **Block 14 acc. override**

Address:	0x275F	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H27.96 **Block 15 acc. override**

Address:	0x2760	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the acceleration ratio of the program block positioning, looping, and fixed stopper tasks.

8.24 H28 Program Block Parameters

H28.00 **Block 0 dec. override**

Address:	0x2800	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.01 **Block 1 dec. override**

Address:	0x2801	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.02 **Block 2 dec. override**

Address:	0x2802	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.03 **Block 3 dec. override**

Address:	0x2803	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.04 Block 4 dec. override

Address:	0x2804	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.05 Block 5 dec. override

Address:	0x2805	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.06 Block 6 dec. override

Address:	0x2806	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.07 Block 7 dec. override

Address:	0x2807	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.08 **Block 8 dec. override**

Address:	0x2808	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.09 **Block 9 dec. override**

Address:	0x2809	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.10 **Block 10 dec. override**

Address:	0x280A	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.11 **Block 11 dec. override**

Address:	0x280B	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.12 **Block 12 dec. override**

Address:	0x280C	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.13 **Block 13 dec. override**

Address:	0x280D	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.14 **Block 14 dec. override**

Address:	0x280E	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.15 **Block 15 dec. override**

Address:	0x280F	Effective mode:	At stop
Min.:	1.00	Unit:	%
Max.:	100.00	Data Type:	UInt16
Default:	100.00	Change:	Real-time

Value Range:

1.00% to 100.00%

Description

Defines the deceleration ratio of the program block positioning, looping, and fixed stopper tasks.

H28.16 **Task mode of block 0**

Address:	0x2810	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier

0: Task execution

1: Task hiding

bit4-7: Subsequent condition

0: END

1: CONTINUE_WITH_STOP

2: CONTINUE_ON_THE_FLY

3: CONTINUE_EXTERNAL

4: CONTINUE_EXTERNAL_WAIT

5: CONTINUE_EXTERNAL_ALARM

bit8-11: Positioning mode

0: Absolute positioning

1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.17 Task mode of block 1

Address:	0x2811	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier0: Task execution1: Task hidingbit4-7: Subsequent condition0: END1: CONTINUE_WITH_STOP2: CONTINUE_ON_THE_FLY3: CONTINUE_EXTERNAL4: CONTINUE_EXTERNAL_WAIT 5: CONTINUE_EXTERNAL_ALARMbit8-11: Positioning mode0: Absolute positioning 1: Relative positioning

H28.18 **Task mode of block 2**

Address:	0x2812	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.19 **Task mode of block 3**

Address:	0x2813	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.20 Task mode of block 4

Address:	0x2814	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.21 **Task mode of block 5**

Address:	0x2815	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.22 Task mode of block 6

Address:	0x2816	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.23 **Task mode of block 7**

Address:	0x2817	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.24 Task mode of block 8

Address:	0x2818	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.25 Task mode of block 9

Address:	0x2819	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier0: Task execution1: Task hidingbit4-7: Subsequent condition0: END1: CONTINUE_WITH_STOP2: CONTINUE_ON_THE_FLY3: CONTINUE_EXTERNAL4: CONTINUE_EXTERNAL_WAIT 5: CONTINUE_EXTERNAL_ALARMbit8-11: Positioning mode0: Absolute positioning 1: Relative positioning

H28.26 Task mode of block 10

Address:	0x281A	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.27 Task mode of block 11

Address:	0x281B	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.28 Task mode of block 12

Address:	0x281C	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.29 Task mode of block 13

Address:	0x281D	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.30 Task mode of block 14

Address:	0x281E	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier0: Task execution1: Task hidingbit4-7: Subsequent condition0: END1: CONTINUE_WITH_STOP2: CONTINUE_ON_THE_FLY3: CONTINUE_EXTERNAL4: CONTINUE_EXTERNAL_WAIT 5: CONTINUE_EXTERNAL_ALARMbit8-11: Positioning mode0: Absolute positioning 1: Relative positioning

H28.31 Task mode of block 15

Address:	0x281F	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

Description

Bit0: Task identifier
0: Task execution
1: Task hiding
bit4-7: Subsequent condition
0: END
1: CONTINUE_WITH_STOP
2: CONTINUE_ON_THE_FLY
3: CONTINUE_EXTERNAL
4: CONTINUE_EXTERNAL_WAIT
5: CONTINUE_EXTERNAL_ALARM
bit8-11: Positioning mode
0: Absolute positioning
1: Relative positioning

H28.32 Block 0 task parameter

Address:	0x2820	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.34 **Block 1 task parameter**

Address:	0x2822	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.36 **Block 2 task parameter**

Address:	0x2824	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.38 **Block 3 task parameter**

Address:	0x2826	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.40 **Block 4 task parameter**

Address:	0x2828	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.42 Block 5 task parameter

Address:	0x282A	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.44 Block 6 task parameter

Address:	0x282C	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.46 Block 7 task parameter

Address:	0x282E	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.
Defines the waiting time setpoint (ms) of the program block wait task.
Defines the target segment number of the program block jump task.
Defines the operand bit (0 to 3) of the program block set O or reset O task.
Bit0 = 1: output signal 1, EPOS_ZSW2.bit10
Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.48 **Block 8 task parameter**

Address:	0x2830	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:
0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.
Defines the waiting time setpoint (ms) of the program block wait task.
Defines the target segment number of the program block jump task.
Defines the operand bit (0 to 3) of the program block set O or reset O task.
Bit0 = 1: output signal 1, EPOS_ZSW2.bit10
Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.50 **Block 9 task parameter**

Address:	0x2832	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:
0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.
Defines the waiting time setpoint (ms) of the program block wait task.
Defines the target segment number of the program block jump task.
Defines the operand bit (0 to 3) of the program block set O or reset O task.
Bit0 = 1: output signal 1, EPOS_ZSW2.bit10
Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.52 Block 10 task parameter

Address:	0x2834	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.54 Block 11 task parameter

Address:	0x2836	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.56 Block 12 task parameter

Address:	0x2838	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.58 **Block 13 task parameter**

Address:	0x283A	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.60 **Block 14 task parameter**

Address:	0x283C	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.62 Block 15 task parameter

Address:	0x283E	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 to 2147483647

Description

Defines the torque limit setpoint (0.01 N·m) of the program block fixed stopper task.

Defines the waiting time setpoint (ms) of the program block wait task.

Defines the target segment number of the program block jump task.

Defines the operand bit (0 to 3) of the program block set O or reset O task.

Bit0 = 1: output signal 1, EPOS_ZSW2.bit10

Bit1 = 1: output signal 2, EPOS_ZSW2.bit11

H28.64 Fixed stopper monitoring window

Address:	0x2840	Effective mode:	At stop
Min.:	0	Unit:	LU
Max.:	4294967295	Data Type:	UInt32
Default:	100	Change:	Real-time

Value Range:

0LU to 4294967295LU

Description

If the motor rotating position exceeds this parameter value after the program block fixture task is reached, E550.9 is reported.

H28.66 Max. following error of fixed stopper

Address:	0x2842	Effective mode:	At stop
Min.:	0	Unit:	LU
Max.:	4294967295	Data Type:	UInt32
Default:	1000	Change:	Real-time

Value Range:

0LU to 4294967295LU

Description

Defines the threshold for determining the position deviation of the fixed block.

H28.68 **External trigger source**

Address:	0x2844	Effective mode:	At stop
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Triggered by STW1.bit13

1: Triggered by DI

Description

Used to trigger the external switchover signal of the program block.

8.25 H29 PN Message Value

H29.00 **Control word 1 (STW1)**

Address:	0x2900	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

Bit0: 1 = Pulse enable allowed; 0 = OFF1, ramp to stop, pulse cleared, ready to switch on
bit1: 1 = No OFF2 (pulse enable allowed); 0 = OFF2, coast to stop, pulse cleared immediately, switch-on inhibited
bit2: 1 = No OFF3 (pulse enable allowed); 0 = OFF3 quick stop, P1135 brake, pulse cleared, switch-on inhibited
bit3: 1 = Enable allowed; 0 = Operation inhibited (pulse cleared)
bit4: 1 = Ramp function generator available; 0 = Ramp function generator inhibited
bit5:1 = Ramp function generator continued; 0 = Ramp function generator output frozen
bit6:1 = Setpoint enabled; 0 = Setpoint inhibited (ramp function generator input being zero)
bit7: Rising edge-triggered, response fault
bit8: JOG1
bit9: JOG2
bit10: 1 = PLC controlled
bit11: Reserved
bit12: Reserved
bit13: Reserved
bit14: Reserved
bit15: Reserved

Description

Indicates the real-time value of the control word 1 (STW1).

H29.01 **Control word 2 (STW2)**

Address:	0x2901	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Indicates the real-time value of the control word 2 (STW-2).

H29.02 **Speed setpoint A (VEL_NSOLL_A)**

Address:	0x2902	Effective mode:	-
Min.:	-32768	Unit:	-
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:
-32768 to 32767
Description
The real-time value of speed setpoint A (VEL_NSOLL_A).

H29.04 **Speed setpoint B (VEL_NSOLL_B)**

Address:	0x2904	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFFFFFF
Description
The real-time value of speed setpoint B (VEL_NSOLL_B).

H29.06 **Encoder control word (G1_STW)**

Address:	0x2906	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

bit0: bit7 = 0, searching for reference point 1; bit7 = 1, measure the pointer 1
bit1: bit7 = 0, searching for reference point 2; bit7 = 1, measure the pointer 2
bit2: bit7 = 0, searching for reference point 3; bit7 = 1, measure the pointer 3
bit3: bit7 = 0, searching for reference point 4; bit7 = 1, measuring pointer 4
bit4: bit4–bit6 000b = Not activated; 001b = Selected functions activated; 010b = Read value; 011b = Cancel
bit5: bit4–bit6 000b = Not activated; 001b = Selected functions activated; 010b = Read value; 011b = Cancel
bit6: bit4–bit6 000b = Not activated; 001b = Selected functions activated; 010b = Read value; 011b = Cancel
bit7: Mode selection; 1 = Real-time measurement; 0 = Searching for the reference point
bit8: Reserved
bit9: Reserved
bit10: Reserved
bit11: Zero setting mode; 0 = Absolute position; 1 = Relative position
bit12: Rising edge-triggered; request for setting the zero bit
bit13: Rising edge-triggered; request for cyclic transmission of absolute position in G1_XIST2
bit14: Parking encoder
bit15: Rising-edge triggered Response encoder fault

Description

Indicates the real-time value of the encoder control word (G1_STW).

H29.07 Position deviation (XERR)

Address:	0x2907	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFFFFFF

Description

Indicates the real-time value of the position deviation (XERR).

H29.09 Position loop gain (KPC)

Address:	0x2909	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x0	Change:	Unchangeable

Value Range:
0x0 to 0xFFFFFFFF
Description
Indicates the real-time value of the position loop gain (KPC).

H29.11 **Position control word 1 (POS_STW1)**

Address:	0x290B	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:
Bit0: bit0–bit5 block selection supports up to 16 blocks
bit1: bit0–bit5 block selection supports up to 16 blocks
bit2: bit0–bit5 block selection supports up to 16 blocks
bit3: bit0–bit5 block selection supports up to 16 blocks
bit4: bit0–bit5 block selection supports up to 16 blocks
bit5: bit0–bit5 block selection supports up to 16 blocks
bit6: Reserved
bit7: Reserved
bit8: 1 = Absolute positioning 0 = Relative positioning
bit9: 1 = Forward
bit10: 1 = Reverse
bit11: Reserved
bit12: 1 = Continuous transmission 0 = MDI block modification activated by running the rising edge of the program segment (STW1.6)
bit13: Reserved
bit14: 1 = Setting signal selected 0 = Positioning signal selected
bit15: 1= MDI sub-mode 0 = Program segment sub-mode
Description
Indicates the real-time value of position control word 1 (POS_STW1).

H29.12 **MDI position setting (EPOS)**

Address:	0x290C	Effective mode:	-
Min.:	0	Unit:	LU
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:
0LU to 4294967295LU

Description

Indicates the real-time value of MDI position setting (EPOS).

H29.14 MDI speed setting (EPOS)

Address:	0x290E	Effective mode:	-
Min.:	0	Unit:	1000 LU/min
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 Lu/min–4294967295 LU/min

Description

Indicates the real-time value of MDI speed reference (EPOS).

H29.16 MDI acceleration override (EPOS)

Address:	0x2910	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the real-time value of the MDI acceleration override (EPOS).

H29.17 MDI deceleration override (EPOS)

Address:	0x2911	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the real-time value of the MDI deceleration override (EPOS).

H29.18 MDI mode (EPOS)

Address:	0x2912	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	Unchangeable

Value Range:

bit0: 1 = Absolute positioning 0 = Relative positioning
bit1: 1 = Forward
bit2: 1 = Reverse
bit3: Reserved
bit4: Reserved
bit5: Reserved
bit6: Reserved
bit7: Reserved
bit8: Reserved
bit9: Reserved
bit10: Reserved
bit11: Reserved
bit12: Reserved
bit13: Reserved
bit14: Reserved
bit15: Reserved

Description

Indicates the real-time value of the MDI mode (EPOS).

H29.19 Position control word 2 (POS_STW2)

Address:	0x2913	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

bit0: 1 = Tracking mode activated
bit1: 1 = Set reference point
bit2: 1 = Reference point stopper activated
bit3: Reserved
bit4: Reserved
bit5: 1 = JOG incremental positioning activated 0 = Speed activated
bit6: Reserved
bit7: Reserved
bit8: Reserved
bit9: 1 = Searching for the reference point in the reverse direction 0 = Start searching for the reference point in the forward direction
bit10: Reserved
bit11: Reserved
bit12: Reserved
bit13: Reserved
bit14: 1 = Software limit switch activated
bit15: 1 = Stopper activated

Description

Indicates the real-time value of position control word 2 (POS_STW2).

H29.20 **Position speed override (EPOS)**

Address:	0x2914	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

Indicates the real-time value of the position speed override (EPOS).

H29.21 **Customized receive word for telegram 111**

Address:	0x2915	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

The real-time value of the customized receive word for telegram 111.

H29.22 Torque reduction (MOMRED)

Address:	0x2916	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the real-time value of the torque reduction value (MOMRED).

H29.23 Torque reference (AdditiveTorque)

Address:	0x2917	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of the torque reference (AdditiveTorque).

H29.24 Torque upper limit

Address:	0x2918	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of the torque upper limit.

H29.25 Torque lower limit

Address:	0x2919	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of the torque lower limit.

H29.26 Customized receive word for 850 additive telegram

Address:	0x291A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of the customized receive word for 850 additive telegram.

H29.27 Message word (MELDW)

Address:	0x291B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the real-time value of the message word (MELDW).

H29.28 Safety control word 1 (S_STW1)

Address:	0x291C	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

Bit0: 1 = Cancel STO, 0 = Select STO
bit1 1: Cancel SS1, 0 = Select SS1
bit2: 1 = Cancel SS2, 0 = Select SS2
bit3 1: Cancel SOS, 0 = Select SOS
bit4 1: Cancel SLS, 0 = Select SLS
bit5: Reserved
bit6: Reserved
bit7: 1 -> 0: Respond to safety failure
bit8: Reserved
bit9: SLS limit value 0
bit10: SLS limit value 1
bit11: Reserved
bit12: 1 = Cancel SDI+, 0 = Select SDI+
bit13 1 = Cancel SDI-, 0 = Select SDI-
bit14: Reserved

bit15: 1= Cancel SSM, 0 = Select SSM

Description

Indicates the real-time value of safety control word 1 (S_STW1).

H29.29 **Safety control word 2 (S_STW2)**

Address:	0x291D	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x0	Change:	Unchangeable

Value Range:

bit0: 1 = Cancel STO, 0 = Select STO
bit1: 1 = Cancel SS1, 0 = Select SS1
bit2: 1 = Cancel SS2, 0 = Select SS2
bit3: 1 = Cancel SOS, 0 = Select SOS
bit4: 1 = Cancel SLS, 0 = Select SLS
bit5: Reserved
bit6: Reserved
bit7: 1-> 0 respond to safety failure
bit8: Reserved
bit9: SLS limit value 0
bit10: SLS limit value 1
bit11: Reserved
bit12: 1 = Cancel SDI+, 0 = Select SDI+
bit13: 1 = Cancel SDI-, 0 = Select SDI-
bit14: Reserved
bit15: 1 = Cancel SSM, 0 = Select SSM
bit16: Reserved
bit17: Reserved
bit18: 1 = Cancel SS1E, 0 = Select SS1E
bit19: Reserved
bit20: Reserved
bit21: Reserved
bit22: Reserved
bit23: Reserved
bit24: Reserved
bit25: Reserved
bit26: Reserved
bit27: Reserved
bit28: 1 = Cancel SS2E, 0 = Select SS2E
bit29: Reserved
bit30: Reserved
bit31: Reserved

Description

Indicates the real-time value of safety control word 2 (S_STW2).

H29.31 Variable SLS limit

Address:	0x291F	Effective mode:	-
Min.:	-32768	Unit:	-
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32768 to 32767

Description

Indicates the real-time value of the variable SLS limit.

H29.50 **Status word 1 (ZSW1)**

Address:	0x2932	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

bit0: 1 = Ready to switch on, control circuit switched on, initialization done
bit1: 1 = Ready to run, main circuit switched on
bit2: 1 = Run enable
bit3: 1 = Fault
bit4: 1 = Coast to stop deactivated (OFF2 deactivated) 0 = Cost to stop activated (OFF2 activated)
bit5: 1 = Quick stop deactivated (OFF2 deactivated) 0 = Quick stop activated (OFF2 activated)
bit6: 1 = Switch-on inhibited
bit7: 1 = Warning existed
bit8: Reserved
bit9: 1 = PLC control request
bit10: Reserved
bit11: Reserved
bit12: Reserved
bit13: Reserved
bit14: Reserved
bit15: Reserved

Description

Indicates the real-time value of status word 1 (ZSW1).

H29.51 **Status word 2 (ZSW2)**

Address:	0x2933	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

bit0: Reserved
bit1: Reserved
bit2: Reserved
bit3: Reserved
bit4: Reserved
bit5: Reserved
bit6: Reserved
bit7: Reserved
bit8: Reserved
bit9: Reserved
bit10: Reserved
bit11: Reserved
bit12: bit12–bit15 drive heartbeat count value, uploaded to PLC
bit13: bit12–bit15 drive heartbeat count value, uploaded to PLC
bit14: bit12–bit15 drive heartbeat count value, uploaded to PLC
bit15: bit12–bit15 drive heartbeat count value, uploaded to PLC

Description

Indicates the real-time value of status word 2 (ZSW2).

H29.52 Speed actual value A (VEL_NIST_A)

Address:	0x2934	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of speed actual value A (VEL_NIST_A).

H29.53 Speed actual value B (VEL_NIST_B)

Address:	0x2935	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

The real-time value of speed actual value B (VEL_NIST_B).

H29.55 Encoder status word (G1_ZSW)

Address:	0x2937	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

bit0: 1 = Function 1 activated
bit1: 1 = Function 2 activated
bit2: 1 = Function 3 activated
bit3: 1 = Function 4 activated
bit4: 1 = Actual value 1 readable
bit5: 1 = Actual value 2 readable
bit6: 1 = Actual value 3 readable
bit7: 1 = Actual value 4 readable
bit8: Touch probe 1
bit9:Touch probe 2
bit10: Reserved
bit11: Response encoder fault
bit12: Set zero response
bit13: Cyclic transmission of the absolute position in G1_XIST2
bit14: Parking encoder activated
bit15: The encoder is faulty.

Description

Indicates the real-time value of the encoder status word (G1_ZSW).

H29.56 Encoder 1 position actual value 1 (G1_XIST1)

Address:	0x2938	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Indicates the real-time value of position actual value 1 of encoder 1 (G1_XIST1).

H29.58 Encoder 1 position actual value 2 (G1_XIST2)

Address:	0x293A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	4294967295	Data Type:	UInt32

Default:	0	Change:	Unchangeable

Value Range:

0 to 4294967295

Description

Indicates the real-time value of position actual value 2 of encoder 1 (G1_XIST2).

H29.60 **Position status word 1 (POS_ZSW1)**

Address:	0x293C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

Bit0: bit0–bit5 effective traversing block supports up to 16 blocks
bit1: bit0–bit5 effective traversing block supports up to 16 blocks
bit2 :bit0–bit5 effective traversing block supports up to 16 blocks
bit3 :bit0–bit5 effective traversing block supports up to 16 blocks
bit4: bit0–bit5 effective traversing block supports up to 16 blocks
bit5: bit0–bit5 effective traversing block supports up to 16 blocks
bit6: Reservedbit7: Reserved

bit8: 1 = Reverse stopper activated
bit9: 1 = Forward stopper activated
bit10: 1 = JOG activated
bit11: 1 = Proactive reference point approach activated
bit12: Reserved
bit13: 1 = Running block activated
bit14: 1 = Setting activated
bit15: 1 = MDI activated
0 = MDI deactivated

Description

Indicates the real-time value of the position status word 1 (POS_ZSW1).

H29.61 **Position status word 2 (POS_ZSW2)**

Address:	0x293D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

bit0:1 = Tracking mode activated
bit1:1 = Speed limit activated
bit2:1 = Setpoint available
bit3: Reserved
bit4:1= Axis moving forwardly
bit5:1 = Axis moving reversely
bit6:1 = Negative software limit switch reached
bit7:1 = Positive software limit switch reached
bit8: 1 = Position actual value < = Limit switch position 1
bit9:1 = Position actual value < = Limit switch position 2
bit10:1 = Direct output 1 through running block setting
bit11:1 = Direct output 2 through running block setting
bit12:1 = Fixed stop point reached
bit13: 1 = Fixed stop point fastening torque reached
bit14: 1 = Running to the fixed stop point activated
bit15: 1 = RUN command activated

Description

Indicates the real-time value of the position status word 2 (POS_SW2).

H29.63 Customized send word for telegram 111

Address:	0x293F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of the user-defined sending word of telegram 111.

H29.65 Fault code (FaultCode)

Address:	0x2941	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the real-time value of the fault code.

H29.66 Warning code

Address:	0x2942	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Indicates the real-time value of the warning code (WarnCode).

H29.67 Actual torque

Address:	0x2943	Effective mode:	-
Min.:	-32768	Unit:	-
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32768 to 32767

Description

The real-time value of the actual torque.

H29.68 User-defined send word for 850 additive telegram

Address:	0x2944	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

The real-time value of the user-defined sending word of additive telegram 850.

H29.69 XIST_A position feedback

Address:	0x2945	Effective mode:	-
Min.:	-2147483648	Unit:	-
Max.:	2147483647	Data Type:	Int32
Default:	0	Change:	Unchangeable

Value Range:

-2147483648 to 2147483647

Description

Indicates the real-time value of the XIST_A position feedback.

H29.71 Safety status word 1 (S_ZSW1)

Address:	0x2947	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

bit0: 1 = STO activated, 0 = STO not activated
bit1: 1 = SS1 not activated, 0 = SS1 not activated
bit2: 1 = SS2 not activated, 0 = SS2 not activated
bit3: 1 = SOS activated, 0 = SOS not activated
bit4: 1 = SLS activated, 0 = SLS not activated
bit5: Reserved
bit6: Reserved
bit7: 1 = Safety failure, 0 = Normal operation
bit8: Reserved
bit9: SLS limit value 0
bit10: SLS limit value 1
bit11: SOS selected
bit12: 1 = SDI+ activated, 0 = SDI+ not activated
bit13: 1 = SDI- activated, 0 = SDI- not activated
bit14: Reserved
bit15: 1 = speed smaller than or equal to SSM threshold, 0 = current speed exceeds the SSM threshold

Description

Indicates the real-time value of safety status word 1 (S_ZSW1).

H29.72 Safety status word 2 (S_ZSW2)

Address:	0x2948	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFFFFFF	Data Type:	UInt32
Default:	0x0	Change:	Unchangeable

Value Range:

Bit0: 1 = STO active, 0 = STO not active
bit1: 1 = SS1 active, 0 = SS1 not active
bit2: 1 = SS2 active, 0 = SS2 not active
bit3: 1 = SOS active, 0 = SOS not active
bit4: 1 = SLS active, 0 = SLS not active
bit5: Reserved
bit6: Reserved
bit7: 1 = safety failure, 0 = normal operation
bit8: Reserved
bit9: SLS limit value 0
bit10: SLS limit value 1
bit11: Reserved
bit12: 1 = SDI + active, 0 = SDI + not active
bit13: 1 = SDI- active, 0 = SDI- not active
bit14: Reserved
bit15: 1 = speed is less than or equal to SSM threshold, 0 = current speed is greater than SSM threshold
bit16: Reserved
bit17: reserved
bit18: 1 = SS1E active, 0 = SS1E not active
bit19: reserved
bit20: Reserved
bit21: Reserved
bit22: Reserved
bit23: Reserved
bit24: 1 = F-DI1 is 1 signal, 0 = F-DI1 is 0 signal
bit25: 1 = F-DI2 is 1 signal, 0 = F-DI2 is 0 signal
bit26: 1 = F-DI3 is 1 signal, 0 = F-DI3 is 0 signal
bit27: 1 = F-DI4 is 1 signal, 0 = F-DI4 is 0 signal
bit28: 1 = SS2E active, 0 = SS2E not active
bit29: 1 = SOS selected, 0 = SOS revoked
bit30: 1 = F-DI5 is 1 signal, 0 = F-DI5 is 0 signal
bit31: Reserved

Description

Indicates the real-time value of safety status word 2 (S_ZSW2).

H29.74 Variable SLS limit state

Address:	0x294A	Effective mode:	-
Min.:	-32768	Unit:	-
Max.:	32767	Data Type:	Int16
Default:	0	Change:	Unchangeable

Value Range:

-32768 to 32767

Description

Indicates the real-time value of the variable SLS limit state.

H29.90 **Modulo axis modulus**

Address:	0x295A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2147483647	Data Type:	UInt32
Default:	0	Change:	Unchangeable

Value Range:

0 to 2147483647

Description

Indicates the real-time effective value (user unit) of the modulo axis modulus.

8.26 H30 Related Variables Read through Communication

H30.00 **Servo state read via communication**

Address:	0x3000	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the current running state of the drive to be communicated to the software.

H30.01 **DO function status 1 read through communication**

Address:	0x3001	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Bit 0 corresponds to DO function 1.

Bit 1 corresponds to DO function 2.

Bit 2 corresponds to DO function 3.

…

By analogy

H30.02 DO function status 2 read through communication

Address:	0x3002	Effective mode:	-
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

H30.16 1st encoder communication timeout count

Address:	0x3010	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

It indicates the total number of communication timeout errors of the first encoder after the latest power-on.

H30.17 1st encoder communication CRC error count

Address:	0x3011	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

It indicates the total number of communication CRC errors of the first encoder after the latest power-on.

H30.18 **1st encoder communication frame stop bit error count**

Address:	0x3012	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

It indicates the total number of communication frame stop bit errors of the encoder after the latest power-on.

H30.20 **Bits 0 and 1 of drive SN code**

Address:	0x3014	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.21 **Bits 2 and 3 of drive SN code**

Address:	0x3015	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.22 **Bits 4 and 5 of drive SN code**

Address:	0x3016	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.23 **Bits 6 and 7 of drive SN code**

Address:	0x3017	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.24 **Bits 8 and 9 of drive SN code**

Address:	0x3018	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.25 **Bits 10 and 11 of drive SN code**

Address:	0x3019	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.26 Bits 12 and 13 of drive SN code

Address:	0x301A	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

H30.27 Bits 14 and 15 of drive SN code

Address:	0x301B	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

H30.20–H30.27 are servo 16-bit SN codes, which are displayed in the form of ASSIC codes.

8.27 H31 Communication Setting

H31.00 VDI virtual level set through communication

Address:	0x3100	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 65535

Description

When H17.90 is set to 1, the VDI state is defined by this parameter.

The VDI logic is determined by H17.91 (Default VDI virtual level value upon power-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

Address:	0x3101	Effective mode:	Real-time
Min.:	0	Unit:	Hz
Max.:	16000000	Data Type:	UInt32
Default:	0	Change:	Real-time

Value Range:

0 Hz–16000000 Hz

Description

When H05.38 is set to 4, H31.01 sets the frequency of the frequency division output port.

H31.04 DO status set through communication

Address:	0x3104	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Real-time

Value Range:

0 to 65535

Description

Sets DO output status.

H31.05 AO status set through communication

Address:	0x3105	Effective mode:	Real-time
Min.:	-10000	Unit:	mV
Max.:	10000	Data Type:	Int16
Default:	0	Change:	Real-time

Value Range:

-10000 mV to 10000 mV

Description

Set H04.50 to 10 to define AO through H31.05 (in mV).

H31.09 Speed reference set through communication

Address:	0x3109	Effective mode:	Real-time
Min.:	-10000.000	Unit:	[mm/s]/[rpm]
Max.:	10000.000	Data Type:	Int32
Default:	0.000	Change:	Real-time

Value Range:

-10000.000[mm/s]/[rpm] to 10000.000[mm/s]/[rpm]

Description

Set H06.02 to 4 to define the speed reference in the speed control mode (unit: 0.001 [mm/s]/[rpm]).

H31.11 **Torque reference set through communication**

Address:	0x310B	Effective mode:	Real-time
Min.:	-100.000	Unit:	%
Max.:	100.000	Data Type:	Int32
Default:	0.000	Change:	Real-time

Value Range:

-100.000% to 100.000%

Description

Set H07.02 to 4 to define the torque reference in the torque control mode through this parameter (unit: 0.001%). The setpoint 100.000% corresponds to the rated torque of the motor.

8.28 H32 Direct Drive Parameters

H32.01 **Encoder interface switchover switch**

Address:	0x3201	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Default encoder interface

1: Switching encoder interface

Description

Encoder interface

0: Default encoder interface

1: Switching encoder interface

H32.02 **Angle auto-tuning upon power-on**

Address:	0x3202	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Angle auto-tuning starts after the drive switches to the rdy state and the time (in seconds) defined by H32.41 elapses.

0: Disabled

1: Enabled

H32.04 Angle auto-tuning state

Address:	0x3204	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

Bit1: A602.9

Description

Display an alarm or status bit when the incremental encoder is not angle auto-tuned.

Bit0: None

Bit1: A602.9

Only bit0 takes effect when both are set.

H32.05 Pre-positioning retract selection

Address:	0x3205	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0: Disabled

1: Enabled

Description

Used to retract by a certain distance after auto-tuning through pre-positioning is done.

0: Disabled

1: Enabled

H32.06 Position feedback

Address:	0x3206	Effective mode:	Real-time

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

Value Range:

0: Disabled

1: Enabled

Description

Used to align the position feedback to the position before angle auto-tuning for incremental encoders.

0: Disabled

1: Enabled

H32.07 Incremental homing method

Address:	0x3207	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Z Signal short circuit

1: Only first short circuit

Description

Set Z signal of the increment encoder during Z signal homing.

0: Z Signal short circuit

1: Only first short circuit

Note: The width of the Z signal is set based on H32.08.

H32.08 Homing signal width

Address:	0x3208	Effective mode:	Real-time
Min.:	100	Unit:	encoder unit
Max.:	65535	Data Type:	UInt16
Default:	800	Change:	At stop

Value Range:

100 to 65535

Description

The setpoint is active after the position is latched by Z signal.

H32.10 Max. reference current in angle auto-tuning through inching

Address:	0x320A	Effective mode:	Real-time

Min.:	10.0	Unit:	%
Max.:	300.0	Data Type:	UInt16
Default:	100.0	Change:	At stop

Value Range:

10.0% to 300.0%

Description

Defines the maximum reference current during auto-tuning.

H32.13 Motor operation threshold (ROT/DDR) in angle auto-tuning through inching

Address:	0x320D	Effective mode:	Real-time
Min.:	0.001	Unit:	deg
Max.:	20.000	Data Type:	UInt16
Default:	0.200	Change:	At stop

Value Range:

0.001deg to 20.000deg

Description

Sets motor operation threshold for position lock angle auto-tuning.

Usually no change is required. If you have special requirements for the operation range, you can adjust this parameter accordingly. The smaller the value, the smaller the operation range during auto-tuning, but the greater the auto-tuning error.

H32.14 Motor standstill threshold (ROT/DDR) in angle auto-tuning through inching

Address:	0x320E	Effective mode:	Real-time
Min.:	0.1	Unit:	[mm/s]/[rpm]
Max.:	100.0	Data Type:	UInt16
Default:	1.0	Change:	At stop

Value Range:

0.1[mm/s]/[rpm]–100.0[mm/s]/[rpm]

Description

Sets motor stop threshold for auto-tuning. Usually no change is required.

H32.20 Max. reference current in angle auto-tuning through pre-positioning (closed-loop)

Address:	0x3214	Effective mode:	Real-time
Min.:	10.0	Unit:	%
Max.:	300.0	Data Type:	UInt16

Default:	100.0	Change:	At stop

Value Range:

10.0% to 300.0%

Description

Defines the maximum reference current during auto-tuning.

H32.22 Electrical angle reference in angle auto-tuning through pre-positioning (closed-loop)

Address:	0x3216	Effective mode:	Real-time
Min.:	0.0	Unit:	deg
Max.:	360.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0deg to 360.0deg

Description

Defines the electrical angle during auto-tuning through pre-positioning.

H32.23 Electrical angle reference change range in angle auto-tuning through pre-positioning (closed-loop)

Address:	0x3217	Effective mode:	Real-time
Min.:	10.0	Unit:	deg
Max.:	170.0	Data Type:	UInt16
Default:	90.0	Change:	At stop

Value Range:

10.0deg to 170.0deg

Description

Defines the electrical angle change range during auto-tuning.

H32.24 Motor stop threshold (ROT/DDR) in angle auto-tuning through pre-positioning (closed-loop)

Address:	0x3218	Effective mode:	Real-time
Min.:	0.1	Unit:	[mm/s]/[rpm]
Max.:	100.0	Data Type:	UInt16
Default:	1.0	Change:	At stop

Value Range:

0.1[mm/s]/[rpm]–100.0[mm/s]/[rpm]

Description

Sets motor stop threshold for auto-tuning. Usually no change is required.

H32.26 Damping in angle auto-tuning through pre-positioning (closed-loop)

Address:	0x321A	Effective mode:	Real-time
Min.:	0.00	Unit:	[N/(m/s)]/[N·m/rpm]
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	At stop

Value Range:

0.00[N/(m/s)]/[N·m/rpm]–655.35[N/(m/s)]/[N·m/rpm]

Description

Sets the damping coefficient for motor auto-tuning. The appropriate coefficient ensures a smooth and impact-free operation.

(1) This coefficient is usually related to the load characteristics. Larger load requires a larger coefficient.

(2) When the coefficient is too small, the auto-tuning process may be prone to strong impact, which is normal. When it is too large, motor operation may be sluggish or even stops, which is also normal and a timeout alarm will be raised.

H32.30 Max. reference current in angle auto-tuning through position lock

Address:	0x321E	Effective mode:	Real-time
Min.:	10.0	Unit:	%
Max.:	300.0	Data Type:	UInt16
Default:	100.0	Change:	At stop

Value Range:

10.0% to 300.0%

Description

Defines the maximum reference current during auto-tuning.

H32.33 Motor operation threshold (ROT/DDR) in angle auto-tuning through position lock

Address:	0x3221	Effective mode:	Real-time
Min.:	0.001	Unit:	deg
Max.:	20.000	Data Type:	UInt16
Default:	0.200	Change:	At stop

Value Range:

0.001deg to 20.000deg

Description

Sets motor operation threshold for position lock angle auto-tuning.
Usually no change is required. If you have special requirements for the operation range, you can adjust this parameter accordingly. The smaller the value, the smaller the operation range during auto-tuning, but the greater the auto-tuning error.

H32.34 Motor standstill threshold (ROT/DDR) in angle auto-tuning through position lock

Address:	0x3222	Effective mode:	Real-time
Min.:	0.1	Unit:	[mm/s]/[rpm]
Max.:	100.0	Data Type:	UInt16
Default:	1.0	Change:	At stop

Value Range:
0.1[mm/s]/[rpm]–100.0[mm/s]/[rpm]

Description
Sets motor stop threshold for auto-tuning. Usually no change is required.

H32.37 Angle gain in angle auto-tuning through position lock

Address:	0x3225	Effective mode:	Real-time
Min.:	0	Unit:	deg/(p/s)
Max.:	10000	Data Type:	UInt16
Default:	1000	Change:	At stop

Value Range:
0deg/(p/s)–10000deg/(p/s)

Description
Defines the angle gain during auto-tuning. A proper setpoint improves the auto-tuning angle accuracy. The default value applies to most of applications.

H32.38 Inertia ratio in angle auto-tuning through position lock

Address:	0x3226	Effective mode:	Real-time
Min.:	0.00	Unit:	-
Max.:	120.00	Data Type:	UInt16
Default:	0.00	Change:	At stop

Value Range:
0.00 to 120.00

Description
Sets the inertia ratio gain for auto-tuning. A proper value can ensure smooth and jitter-free operation and reduce the operation range.

(1) This coefficient is usually related to the load characteristics. You can just set it to the actual inertia ratio.
(2) A small value may lead to long movement during auto-tuning, which is a normal phenomenon. A large value may lead to gain mismatch oscillation.

H32.39 **Gain class in angle auto-tuning through position lock**

Address:	0x3227	Effective mode:	Real-time
Min.:	4	Unit:	level
Max.:	31	Data Type:	UInt16
Default:	16	Change:	At stop

Value Range:
4level to 31level
Description
Defines the loop stiffness level gain for auto-tuning. A proper value can ensure smooth and jitter-free operation and reduce the operation range.
(1) A small value may lead to long movement during auto-tuning, which is a normal phenomenon. A large value may lead to gain mismatch oscillation.

H32.41 **Angle auto-tuning delay after power-on**

Address:	0x3229	Effective mode:	Real-time
Min.:	0	Unit:	s
Max.:	65535	Data Type:	UInt16
Default:	3	Change:	Real-time

Value Range:
0s to 65535s
Description
Used to set automatic angle auto-tuning delay upon power-on.

H32.45 **Black box channel 28 function**

Address:	0x322D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Real-time target speed (607Ah)
1: Electric angle
Description

Select the black box channel 28 function.
0: Real-time target position
1: Electric angle

H32.50 **32-bit range compatibility**

Address:	0x3232	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	99	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:
0 to 99
Description
32-bit range compatibility.

H32.70 **Motor overload protection mode**

Address:	0x3246	Effective mode:	Upon the next power-on
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0: Internal motor overload curve
1: External motor overload curve
2: Current limit overload protection
3: Hide motor overload protection
Description
Set motor overload protection mode
0: Internal motor overload curve
1: External motor overload curve
2: Current limit overload protection
3: Hide motor overload protection

H32.73 **Thermal threshold current of overload current limit**

Address:	0x3249	Effective mode:	Upon the next power-on
Min.:	10.0	Unit:	%
Max.:	750.0	Data Type:	UInt16
Default:	115.0	Change:	At stop

Value Range:
10.0% to 750.0%

Description

Thermal limit current is a percentage of motor rated current defaulted to 100%, above which the motor starts to heat continuously. The motor current will be finally maintained at this value.

H32.74 **Peak current of overload current limit**

Address:	0x324A	Effective mode:	Upon the next power-on
Min.:	100.0	Unit:	%
Max.:	750.0	Data Type:	UInt16
Default:	300.0	Change:	At stop

Value Range:

100.0% to 750.0%

Description

Defines the ratio of the peak current that can be reached by the motor to the rated current of the motor.

H32.75 **Max. current duration of overload protection**

Address:	0x324B	Effective mode:	Real-time
Min.:	0.01	Unit:	s
Max.:	655.35	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.01s to 655.35s

Description

Calculate the maximum heat that can be reached by the motor based on the maximum current continuous time, and take this value as the motor overload alarm threshold.

H32.76 **Current limit time constant of overload protection**

Address:	0x324C	Effective mode:	Real-time
Min.:	0.01	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	1.00	Change:	At stop

Value Range:

0.01 to 655.35

Description

It is related to the maximum current continuous time. The higher the setpoint, the longer the maximum current continuous time will be.

H32.77 **Current limit alarm threshold of overload protection**

Address:	0x324D	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	750.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0% to 750.0%

Description

If current limit protection is effective, and the limited current is lower than this value, the drive will raise an alarm.

H32.78 **Current limit fault threshold of overload protection**

Address:	0x324E	Effective mode:	Real-time
Min.:	0.0	Unit:	%
Max.:	750.0	Data Type:	UInt16
Default:	0.0	Change:	At stop

Value Range:

0.0% to 750.0%

Description

If current limit protection is effective, and the limited current is lower than this value, the drive will report an error.

H32.79 **Thermal threshold current of overload**

Address:	0x324F	Effective mode:	Upon the next power-on
Min.:	10.0	Unit:	%
Max.:	750.0	Data Type:	UInt16
Default:	115.0	Change:	At stop

Value Range:

10.0% to 750.0%

Description

Set thermal threshold current of overload.

H32.80 **Thermal current interval of overload**

Address:	0x3250	Effective mode:	Upon the next power-on
Min.:	0.1	Unit:	%
Max.:	204.8	Data Type:	UInt16
Default:	6.4	Change:	At stop

Value Range:

0.1% to 204.8%

Description

Set the thermal current interval of overload.

H32.81 Overload heat dissipation current interval

Address:	0x3251	Effective mode:	Upon the next power-on
Min.:	0.1	Unit:	%
Max.:	204.8	Data Type:	UInt16
Default:	6.4	Change:	At stop

Value Range:

0.1% to 204.8%

Description

Set the overload heat dissipation current interval.

H32.82 Length of overload heat dissipation curve

Address:	0x3252	Effective mode:	Upon the next power-on
Min.:	1	Unit:	-
Max.:	200	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 200

Description

Set the length of overload heat dissipation curve.

H32.83 Length of overload heat dissipation curve

Address:	0x3253	Effective mode:	Upon the next power-on
Min.:	1	Unit:	-
Max.:	200	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

1 to 200

Description

Set the length of overload heat dissipation curve.

8.29 H33 Compensation Parameters

H33.00 Compensation data BUFFER0

Address:	0x3300	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER0.

H33.01 Compensation data BUFFER1

Address:	0x3301	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER1.

H33.02 Compensation data BUFFER2

Address:	0x3302	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER2.

H33.03 Compensation data BUFFER3

Address:	0x3303	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER3.

H33.04 Compensation data BUFFER4

Address:	0x3304	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER4.

H33.05 Compensation data BUFFER5

Address:	0x3305	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER5.

H33.06 Compensation data BUFFER6

Address:	0x3306	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER6.

H33.07 Compensation data BUFFER7

Address:	0x3307	Effective mode:	Real-time

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

Value Range:
0 to 65535
Description
Set compensation data BUFFER7.

H33.08 **Compensation data BUFFER8**

Address:	0x3308	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0 to 65535
Description
Set compensation data BUFFER8.

H33.09 **Compensation data BUFFER9**

Address:	0x3309	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0 to 65535
Description
Set compensation data BUFFER9.

H33.10 **Compensation data BUFFER10**

Address:	0x330A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0 to 65535
Description
Set compensation data BUFFER10.

H33.11 Compensation data BUFFER11

Address:	0x330B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER11.

H33.12 Compensation data BUFFER12

Address:	0x330C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER12.

H33.13 Compensation data BUFFER13

Address:	0x330D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER13.

H33.14 Compensation data BUFFER14

Address:	0x330E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER14.

H33.15 Compensation data BUFFER15

Address:	0x330F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER15.

H33.16 Compensation data BUFFER16

Address:	0x3310	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER16.

H33.17 Compensation data BUFFER17

Address:	0x3311	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER17.

H33.18 Compensation data BUFFER18

Address:	0x3312	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER18.

H33.19 Compensation data BUFFER19

Address:	0x3313	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER19.

H33.20 Compensation data BUFFER20

Address:	0x3314	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER20.

H33.21 Compensation data BUFFER21

Address:	0x3315	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER21.

H33.22 Compensation data BUFFER22

Address:	0x3316	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER22.

H33.23 Compensation data BUFFER23

Address:	0x3317	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER23.

H33.24 Compensation data BUFFER24

Address:	0x3318	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER24.

H33.25 Compensation data BUFFER25

Address:	0x3319	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER25.

H33.26 Compensation data BUFFER26

Address:	0x331A	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER26.

H33.27 Compensation data BUFFER27

Address:	0x331B	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER27.

H33.28 Compensation data BUFFER28

Address:	0x331C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER28.

H33.29 Compensation data BUFFER29

Address:	0x331D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER29.

H33.30 **Compensation data BUFFER30**

Address:	0x331E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER30.

H33.31 **Compensation data BUFFER31**

Address:	0x331F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER31.

H33.32 **Compensation data BUFFER32**

Address:	0x3320	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER32.

H33.33 Compensation data BUFFER33

Address:	0x3321	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER33.

H33.34 Compensation data BUFFER34

Address:	0x3322	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER34.

H33.35 Compensation data BUFFER35

Address:	0x3323	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER35.

H33.36 Compensation data BUFFER36

Address:	0x3324	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER36.

H33.37 Compensation data BUFFER37

Address:	0x3325	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER37.

H33.38 Compensation data BUFFER38

Address:	0x3326	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER38.

H33.39 Compensation data BUFFER39

Address:	0x3327	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Set compensation data BUFFER39.

H33.40 Current Compensation BUFFER group number

Address:	0x3328	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16

Default:	0	Change:	At stop

Value Range:

0 to 65535

Description

Current Compensation BUFFER group number

H33.41 Compensation data sum

Address:	0x3329	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	32767	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 32767

Description

Set compensation data sum.

H33.44 Data command

Address:	0x332C	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0 to 1

Description

Data command.

H33.45 Data storage position

Address:	0x332D	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	1	Change:	At stop

Value Range:

0: Servo RAM

1: Servo FLASH

2: Encoder FLASH

Description

Set data storage position
0: Servo RAM
1: Servo FLASH
2: Encoder FLASH

H33.46 **Data clear**

Address:	0x332E	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	3	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0 to 3
Description
Data clear.

H33.47 **Software tool write status**

Address:	0x332F	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:
0 to 2
Description
Display software write status: 0 - Idle; 1 - Writing BUFFER; 2 - Writing BUFFER completed

H33.48 **Servo read status**

Address:	0x3330	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
Display servo read status: 0 - Idle; 1 - Reading BUFFER; 2 - Reading BUFFER completed

H33.49 Software tool read status

Address:	0x3331	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	2	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 2

Description

Display software read status: 0 - Idle; 1 - Reading BUFFER; 2 - Reading BUFFER completed

H33.50 Servo write status

Address:	0x3332	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Display servo write status: 0 - Idle; 1 - Writing BUFFER; 2 - Writing BUFFER completed

H33.51 Data transmission completed flag

Address:	0x3333	Effective mode:	Real-time
Min.:	0	Unit:	-
Max.:	1	Data Type:	UInt16
Default:	0	Change:	At stop

Value Range:

0 to 1

Description

Data transmission completed flag.

H33.52 Servo data transfer completed flag

Address:	0x3334	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Servo data transfer completed flag: 0: Uncompleted; 1: Completed

H33.81 Motor cogging torque ripple compensation sum

Address:	0x3351	Effective mode:	Real-time
Min.:	0	Unit:	count
Max.:	65535	Data Type:	UInt16
Default:	2000	Change:	At stop

Value Range:

0count to 65535count

Description

Motor cogging torque ripple compensation sum

8.30 H34 Servo Motor Parameters 2

H34.12 Error type supported by EnDat2.2 encoder

Address:	0x340C	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

bit0: Light source; bit1: Signal amplitude; bit2: Position; bit3: Overvoltage; bit4: Undervoltage; bit5: Overcurrent; bit6: Battery

H34.13 Alarm types supported by EnDat2.2 encoders

Address:	0x340D	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

bit0: Transmission rate too high, bit1: Overtemperature, bit2: Interior light source approaching limit position, bit3: Battery voltage low, bit4: Reference point not reached, bit5: Reserved, bit6: Approaching limit position, bit7: Probe not at position, bit8: Value change too small

H34.14 Error value output by EnDat2.2 encoder

Address:	0x340E	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

bit0: Light source; bit1: Signal amplitude; bit2: Position; bit3: Overvoltage; bit4: Undervoltage; bit5: Overcurrent; bit6: Battery

H34.15 Alarm value output by EnDat2.2 encoder

Address:	0x340F	Effective mode:	-
Min.:	0x0	Unit:	-
Max.:	0xFFFF	Data Type:	UInt16
Default:	0x0	Change:	Unchangeable

Value Range:

0x0 to 0xFFFF

Description

bit0: Transmission rate too high, bit1: Overtemperature, bit2: Interior light source approaching limit position, bit3: Battery voltage low, bit4: Reference point not reached, bit5: Reserved, bit6: Approaching limit position, bit7: Probe not at position, bit8: Value change too small

8.31 H3A servo version No.

H3A.00 MCU software version - VR version

Address:	0x3A00	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:
0.00 to 655.35
Description
Displays MCU software version - VR version, with 2 decimal places.

H3A.01 **MCU software version - C SPC version**

Address:	0x3A01	Effective mode:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:
0.000 to 65.535
Description
Displays MCU software version - C SPC version, with 3 decimal places.

H3A.02 **MCU software version - non-standard version**

Address:	0x3A02	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:
0 to 65535
Description
Displays the MCU software version number - non-standard version number.

H3A.03 **MCU software version - test, trial version**

Address:	0x3A03	Effective mode:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:
0.000 to 65.535
Description
Displays MCU software version - test, trial version, with three decimal places.

H3A.04 **MCU software version - software version**

Address:	0x3A04	Effective mode:	-

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

Value Range:

0 to 65535

Description

Displays the MCU software version - software version.

H3A.05 FPGA software version - VR version

Address:	0x3A05	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

Displays FPGA software version - VR version, with 2 decimal places.

H3A.06 FPGA software version - C SPC version

Address:	0x3A06	Effective mode:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 to 65.535

Description

Displays FPGA software version - C SPC version, with 3 decimal places.

H3A.07 FPGA software version - non-standard version

Address:	0x3A07	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the FPGA software version number - non-standard version number.

H3A.08 **FPGA software version - test, trial version**

Address:	0x3A08	Effective mode:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 to 65.535

Description

Displays FPGA software version - test, trial version, with three decimal places.

H3A.09 **FPGA software version - software version**

Address:	0x3A09	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the FPGA software version - software version.

H3A.10 **SAFE software version - VR version**

Address:	0x3A0A	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data Type:	UInt16
Default:	0.00	Change:	Unchangeable

Value Range:

0.00 to 655.35

Description

Displays SAFE software version - VR version, with 2 decimal places.

H3A.11 **SAFE software version - C SPC version**

Address:	0x3A0B	Effective mode:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 to 65.535

Description

Displays SAFE software version - C SPC version, with 3 decimal places.

H3A.12 SAFE software version - non-standard version

Address:	0x3A0C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the SAFE software version number - non-standard version number.

H3A.13 SAFE software version - test, trial version

Address:	0x3A0D	Effective mode:	-
Min.:	0.000	Unit:	-
Max.:	65.535	Data Type:	UInt16
Default:	0.000	Change:	Unchangeable

Value Range:

0.000 to 65.535

Description

Displays SAFE software version - test, trial version, with three decimal places.

H3A.14 SAFE software version - software version

Address:	0x3A0E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data Type:	UInt16
Default:	0	Change:	Unchangeable

Value Range:

0 to 65535

Description

Displays the SAFE software version - software version.

H3A.15 Communication version - 200P

Address:	0x3A0F	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data Type:	UInt16

Default:	0.0	Change:	Unchangeable

Value Range:

0.0 to 6553.5

Description

Communication version - 200P

9 Certification and Standard Requirements

CE Certification

reference	Standard	
EMC command 2014/30/EU	Servo drive	EN 61800-3 EN 61800-6-2 EN 61800-6-4 EN 55011
	Servo Motor	
Low Voltage Directive 2014/35/EU	Servo drive	EN 61800-5-1
	Servo Motor	EN 60034-1 EN 60034-5
RoHS Directive 2011/65/EU	Servo drive	EN 50581
	Servo Motor	

UL/cUL certification

Certification	Standard	
UL/cUL certification	Servo drive	UL61800-5-1 C22.2 No.274-17
	Servo Motor	UL 1004-1 UL 1004-6 CSA C22.2 No. 100-14

Note

The drive complies with the latest version of directives and standards for CE and UL/cUL certifications.

KC Certification

Certification	Standard	
KC Certification	Servo drive	KN 61800-3 (Ver 2014.06) (IEC 61800-3 Ver 2012.03)

Others

The SV680F-INT series servo drive meets the requirements of EAC, UKCA and functional safety certification.

Certification	Standard	
EAC Certification	Servo drive	TP TC 004/2011 TP TC 020/2011

9.1 CE Certification

Figure 9-1 CE Marking

- The CE mark indicates compliance with the Low Voltage Directive LVD), Electromagnetic Compatibility (EMC), and Restriction of Hazardous Substances (RoHS) directives.
- The CE mark is required for engaging in commercial business (production, importation, and distribution) in Europe.
- The drive complies with LVD, EMC, and RoHS directives and carries the CE mark.
- Machines and devices integrated with this drive must also comply with CE requirements for distribution in Europe.
- The integrator who integrates this drive into other products and attaches CE mark to the final assembly has the responsibility of ensuring compliance with CE certification.

9.1.1 Requirements for Compliance with EMC

The drive is applicable to the first environment and second environment and complies with EMC directive 2014/30/EU and standard EN 61800-3.

As required by EMC Directive 2014/30/EU and standard EN IEC 61800-3, install an EMC filter on the input side of the drive and use shielded cables on the output side. Ensure the filter is grounded properly and the shield of the output cable is grounded 360 degrees.

Caution

When applied in the first environment, the drive may generate radio interference. In addition to the CE compliance requirements described in this chapter, take additional measures to prevent radio interference if necessary.

Introduction to EMC standards

Electromagnetic compatibility (EMC) describes the ability of electrical and electronic devices or systems to work properly in the electromagnetic environment without introducing electromagnetic interferences that disturb the operation of other local devices or systems. In other words, EMC includes two aspects: 1) The electromagnetic interference generated by a device during normal operation cannot exceed a certain limit. 2) The device must have sufficient immunity to the electromagnetic interference in the environment.

EN 61800-3 defines the following two types of environments.

- First environment: Environment that includes domestic premises, and establishments directly connected without intermediate transformers to a low-voltage power supply network which supplies buildings used for domestic purposes
- Second environment: Environment that includes all establishments other than those directly connected to a low-voltage power supply network which supplies buildings used for domestic purposes

Devices are divided into the following four categories based on the intended application environment.

- Category C1: a Power drive system (PDS) with the rated voltage less than 1000 V, intended for use in the first environment.
- Category C2 equipment: PDS with rated voltage less than 1000 V, which is neither a plug-in device nor a movable device and, when used in the first environment, is intended to be installed and commissioned only by professionals.
- Category C3 equipment: PDS with rated voltage less than 1000 V, intended for use in the second environment and not intended for use in the first environment.
- Category C4 equipment: PDS with rated voltage equal to or above 1000 V, or rated current equal to or above 400 A, or intended for use in complex systems in the second environment.

9.1.2 Requirements for Compliance with LVD

The drive has been tested in accordance with EN61800-5-1 to determine compliance with LVD. Observe the following requirements to enable machines and devices integrated with this drive to comply with LVD.

Installation location

Install the drive in a place with overvoltage category III and pollution degree 1 or 2 as specified by EN61800-5-1.

Installation Environment

For requirements of the installation environment, see *"3.3.1 Installation Environment Requirements" on page 66*.

Protection

The drive must be installed in a fireproof cabinet with doors that provide effective electrical and mechanical protection. The installation must conform to local and regional laws and regulations and relevant IEC standards.

IP20-rated drives intended to be installed inside the cabinet must be installed in a structure that prevents intrusion of unwanted objects from the top and the front.

Main Circuit Cable Requirements

For wiring requirements of main circuit terminals, see *"6.1.2 Wiring Precautions and Requirements" on page 95*.

Requirements of protective devices

To comply with EN 61800-5-1, install a fuse/circuit breaker on the input side of the drive to prevent accidents caused by short circuit in the internal circuit.

See *"2.4.1.1 Fuse" on page 30* for recommended fuse models and *"2.4.1.3 Breaker" on page 32* for recommended breaker models.

9.1.3 Cable Specifications (CE)

Table 9–1 Recommended main circuit cables

Servo Drive Model			L1C, L2C		L1, L2, L3/R, S, T		P ⊕ , D, C, N ⊖ , N2, N1		U, V, W, PE		Grounding terminal	
Size	Model	Rated input current (A)	(mm^2)	AWG	(mm^2)	AWG	(mm^2)	AWG	(mm^2)	AWG	(mm^2)	AWG
Single-phase 200 V												
A	S1R6	2.3	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
	S2R8	4	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
C	S5R5	7.9	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	S7R6	9.6	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
D	S012	12.8	2×3.33	12	3×3.33	12	2×3.33	12	4×1.31	16	3.33	12
Three-phase 200 V												
A	S1R6	1.1	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
	S2R8	2.3	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
C	S5R5	4.4	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	S7R6	5.1	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
D	S012	8	2×2.08	14	3×2.08	14	2×2.08	14	4×1.31	16	2.08	14
E	S018	8.7	2×3.33	12	3×3.33	12	2×3.33	12	4×2.08	14	3.33	12
	S022	11	2×5.26	10	3×5.26	10	2×5.26	10	4×2.08	14	5.26	10
	S027	23.8	2×8.4	8	3×8.4	8	2×8.4	8	4×3.33	12	8.4	8
Three-phase 400 V												
C	T3R5	2.4	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
	T5R4	3.6	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
D	T8R4	5.6	2×0.81	18	3×0.81	18	2×0.81	18	4×0.52	20	0.81	18
	T012	8	2×2.08	14	3×2.08	14	2×2.08	14	4×1.31	16	2.08	14
E	T017	12	2×3.33	12	3×3.33	12	2×3.33	12	4×2.08	14	2.08	14
	T021	16	2×5.26	10	3×5.26	10	2×5.26	10	4×2.08	14	3.33	12
	T026	21	2×8.4	8	3×8.4	8	2×8.4	8	4×3.33	12	8.4	8

Note

Cable selection should be carried out in line with the standard EN60204-1 according to the circuit breaker current.

Table 9–2 Recommended Cable Specifications and Models

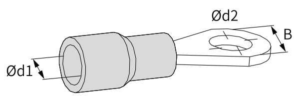
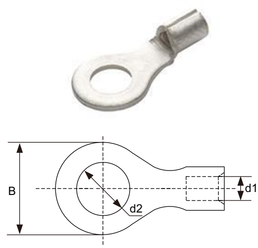
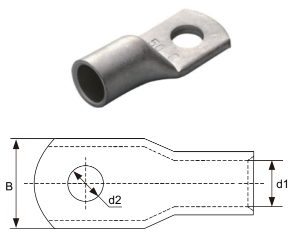
Cable Type	Cable Size	OD (mm)
Power cable	4×10AWG	14.1±0.5
	4×12AWG	12.2±0.4
	4×14AWG	10.5±0.3
	4×20AWG	6.5±0.2
Power cable shield	4×10AWG	14.1±0.5
	4×12AWG	12.9±0.4
	4×14AWG	11.2±0.4
	4×20AWG	6.5±0.2
Power cable + brake cable	4 × 20AWG + 2 × 24AWG	6.5±0.2
Brake cable	2×18AWG	5.8±0.2
	2×20AWG	5.0±0.2

Table 9–3 Main circuit cable lug model and tightening torque

<table>
<tr><th colspan="3">Servo Drive Model</th><th colspan="4">Recommended PVC Cable Model (at 40°C)</th></tr>
<tr><th>Size</th><th>Model</th><th>Rated Input Current (A)</th><th>U, V, W, PE</th><th>Recommended Model of Brake Cable Lug</th><th>Recommended Model of Grounding Cable Lug</th><th>Tightening Torque (N·m)</th></tr>
<tr><td colspan="7">Single-phase 200 V</td></tr>
<tr><td rowspan="2">A</td><td>S1R6</td><td>2.3</td><td rowspan="2">GTVE10008</td><td rowspan="2">GTVE05008</td><td rowspan="2">TVR1.25–4</td><td rowspan="4">1.36</td></tr>
<tr><td>S2R8</td><td>4</td></tr>
<tr><td rowspan="2">C</td><td>S5R5</td><td>7.9</td><td>GTVE15008</td><td>GTVE10008</td><td rowspan="2">TVR2-4</td></tr>
<tr><td>S7R6</td><td>9.6</td><td rowspan="2">GTVE20008</td><td rowspan="2">GTVE15008</td></tr>
<tr><td>D</td><td>S012</td><td>12.8</td><td>TNR3.5–4</td><td>1.36</td></tr>
<tr><td colspan="7">Three-phase 200 V</td></tr>
<tr><td rowspan="2">A</td><td>S1R6</td><td>1.1</td><td rowspan="2">GTVE10008</td><td rowspan="2">GTVE05008</td><td rowspan="2">TVR1.25–4</td><td rowspan="4">1.36</td></tr>
<tr><td>S2R8</td><td>2.3</td></tr>
<tr><td rowspan="2">C</td><td>S5R5</td><td>4.4</td><td>GTVE15008</td><td>GTVE10008</td><td rowspan="3">TVR2-4</td></tr>
<tr><td>S7R6</td><td>5.1</td><td rowspan="2">GTVE20008</td><td rowspan="2">GTVE15008</td></tr>
<tr><td>D</td><td>S012</td><td>8.0</td><td>1.36</td></tr>
<tr><td rowspan="3">E</td><td>S018</td><td>8.7</td><td>GTVE40008</td><td>GTVE15008</td><td>TNR3.5–4</td><td rowspan="2">1.36</td></tr>
<tr><td>S022</td><td>11.0</td><td>GTVE15008</td><td>GTVE10008</td><td>TNR5.5–4</td></tr>
<tr><td>S027</td><td>23.8</td><td>GTVE25010</td><td>GTVE15008</td><td>GTNR10-4</td><td>1.36</td></tr>
<tr><td colspan="7">Three-phase 400 V</td></tr>
</table>

Servo Drive Model			Recommended PVC Cable Model (at 40°C)			
Size	Model	Rated Input Current (A)	U, V, W, PE	Recommended Model of Brake Cable Lug	Recommended Model of Grounding Cable Lug	Tightening Torque (N·m)
C	T3R5	2.4	GTVE10008	GTVE05008	TVR1.25–4	1.36
	T5R4	3.6				
D	T8R4	5.6	GTVE20008	GTVE15008		
	T012	8.0			TVR2-4	1.36
E	T017	12.0	TVR3.5–4	GTVE10008	TNR3.5–4	
	T021	16.0	TVR3.5–4	GTVE10008	TNR5.5–4	1.36
	T026	21.0	TVR5.5–4	GTVE10008	GTNR10-4	1.36

Table 9–4 Dimension drawing of the recommended grounding cable lug

Lug Model		d1 (mm)	d2 (mm)	B (mm)	Dimension Drawing
TVR	1.25–4	4.0	4.3	8.0	
	2–4	4.8	4.3	8.5	
TNR	3.5–4	3.2	4.3	9.5	
	5.5–4	3.5	4.3	9.5	
GTNR	10–4	5.0	4.3	12.4	

9.2 UL/cUL Certification

Figure 9-2 UL/cUL marking

The UL/cUL mark commonly applies to products sold in the United States and Canada. Products with UL/cUL mark have been inspected and assessed by the UL organization. To pass UL/cUL certification, main built-in components of electrical products must also be UL certified.

The drive has been tested in accordance with UL 61800–5–1 and CSA C22.2 No. 274 to determine compliance with UL/cUL standards. Observe the following requirements to enable machines and devices integrated with this drive to comply with UL/cUL standards.

Installation location

Install the drive in a place with overvoltage category III and pollution degree 1 or 2 as specified by UL61800–5–1.

Ambient temperature

According to the protection level, the ambient temperature must be maintained within the following range:

Ambient temperature for open-type drives: 0°C to 50°C.

Installation requirements

Installation requirements for open-type drives:

SV680F-INT series servo drives are open-type drives that must be installed in a fireproof cabinet with the housing that provides effective electrical and mechanical protection. The installation must conform to local laws and regulations and related NEC requirements.

Main Circuit Cable Requirements

Warning

On-site installation of output terminals (such as P ⊕ , C, and N ⊖) is not allowed.

- Terminals P ⊕ , C, and N ⊖ are used to connect optional parts. Do not connect these terminals to an AC power supply.

- To protect the main circuit, separate and cover the surface that may come into contact with the main circuit.
- The control circuit is the internal safety extra-low voltage (SELV) circuit that must be strictly insulated and isolated from other circuits. Make sure that the control circuit is connected to the external SELV circuit.
- Prevent foreign matters from entering the wiring part of the terminal block.
- Do not solder the twisted conductors.
- The tightening torque may vary with terminals. Tighten terminal screws with the specified tightening torque. You can use the torque screwdriver, ratchet, or wrench.
- When using an electric screwdriver to tighten terminal screws, set a low speed to prevent damage to the terminal screws.
- Tighten the terminal screws with an angle not higher than 5°. Failure to comply may damage the terminal screws.

Wiring requirements of the control circuit

Observe the requirements in UL508 during wiring.

Cable requirements

Cable dimensions must be compliant with requirements in NEC (National Electric Code) and CEC (Canadian Electrical Code) Part I and local regulations.

- Use cables with copper conductors.
- The recommended cables for the main circuit are 600 V Class 2 heat-resistant indoor PVC cables that can work under temperature of 75°C continuously. Requirements:
  - Ambient temperature: < 40°C.
  - Normal operating ratings

If the recommended cable specifications for peripheral devices or optional parts exceed the applicable cable specification range, contact Inovance.

Cable selection

To comply with UL61800-5-1 and CSAC22.2 No. 274-17, power cables used for the drive must meet the following requirements:

- Compliant with NEC, Table 310-16 of NFPA70 and NFPA779.
- Comprised of copper conductors with a rated temperature not lower than 75°C (167°F).
- Cable size must be 14AWG or higher.
- With a rated voltage not lower than the rated voltage of the servo drive.
- It is recommended to use cables compliant with UL758 Style 2517 and Style 2586 as motor main circuit cables.

Requirements of protective devices

To comply with UL61800-5-1, install a fuse/circuit breaker on the input side of the drive to prevent accidents caused by short circuit in the internal circuit.

Install sufficient protective devices against short circuit in branch circuits according to applicable regulations and this guide. The drive is applicable to circuits with a rated breaking capacity lower than 5kA and 65 kA and a maximum voltage of 480 VAC (class 400 V).

Note

All breaker protective devices must be UL-certified.

For the SV680F-INT drive applied in North America, the recommended protective devices are as follows:

Table 9–5 Recommended protective devices

Drive Model		Circuit breaker (A)	Class J fuse (A)	Recommended inverse time lag breaker[1] (A)
Single-phase 200 V				
Size A	S1R6	15	6	40
	S2R8	10	10	40
Size C	S5R5	15	20	40
	S7R6	15	20	100
Size D	S012	20	20	100
Three-phase 200 V				
Size A	S1R6	5	6	40
	S2R8	10	6	40
Size C	S5R5	15	15	40
	S7R6	15	15	100
Size D	S012	20	20	100
Size E	S018	30	20	100
	S022	30	35	100
	S027	40	40	100
Three-phase 400 V				
Size C	3R5	15	6	100
	5R4	15	10	100
Size D	T8R4	20	15	100
	T012	20	20	100
Size E	T017	30	35	100
	T021	30	35	100
	T026	40	40	100

Note

[1]: It is recommended to use an inverse time circuit breaker for a parallel multi-drive system.

9.2.1 Cable Specifications (UL)

Table 9–6 Recommended main circuit cables

Servo Drive Model			L1C, L2C		L1, L2, L3/R, S, T		P ⊕ , D, C, N ⊝ , N2, N1		U, V, W, PE		Grounding terminal	
Size	Model	Rated input current (A)	(mm^2)	AWG	(mm^2)	AWG	(mm^2)	AWG	(mm^2)	AWG	(mm^2)	AWG
Single-phase 200 V												
A	S1R6	2.3	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	S2R8	4	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
C	S5R5	7.9	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	S7R6	9.6	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
D	S012	12.8	2×3.33	12	3×3.33	12	2×3.33	12	4×1.31	16	3.33	12
Three-phase 200 V												
A	S1R6	1.1	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	S2R8	2.3	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
C	S5R5	4.4	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	S7R6	5.1	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
D	S012	8	2×2.08	14	3×2.08	14	2×2.08	14	4×1.31	16	2.08	14
E	S018	8.7	2×2.08	14	3×2.08	14	2×2.08	14	4×2.08	14	2.08	14
	S022	11	2×2.08	14	3×2.08	14	2×2.08	14	4×2.08	14	2.08	14
	S027	23.8	2×5.26	10	3×5.26	10	2×5.26	10	4×3.33	12	5.26	10
Three-phase 400 V												
C	T3R5	2.4	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	T5R4	3.6	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
D	T8R4	5.6	2×2.08	14	3×2.08	14	2×2.08	14	4×0.52	20	2.08	14
	T012	8	2×2.08	14	3×2.08	14	2×2.08	14	4×1.31	16	2.08	14
E	T017	12	2×2.08	14	3×2.08	14	2×2.08	14	4×2.08	14	2.08	14
	T021	16	2×3.33	12	3×3.33	12	2×3.33	12	4×2.08	14	3.33	12
	T026	21	2×5.26	10	3×5.26	10	2×5.26	10	4×3.33	12	5.26	10

Table 9–7 Recommended Cable Specifications and Models

Cable Type	Cable Size	OD (mm)
Power cable	4×10AWG	14.1±0.5
	4×12AWG	12.2±0.4
	4×14AWG	10.5±0.3
Power cable shield	4×10AWG	14.1±0.5
	4×12AWG	12.9±0.4
	4×14AWG	11.2±0.4
Power cable + brake cable	4 × 20AWG + 2 × 24AWG	6.5±0.2
Brake cable	2×18AWG	5.8±0.2
	2×20AWG	5.0±0.2

Table 9–8 Main circuit cable lug model and tightening torque

Servo Drive Model			Recommended PVC Cable Model (at 40°C)			
Size	Model	Rated Input Current (A)	U, V, W, PE	Recommended Model of Brake Cable Lug	Recommended Model of Grounding Cable Lug	Tightening Torque (N·m)
Single-phase 200 V						
A	S1R6	2.3	GTVE10008	GTVE05008	TVR2–4	-
	S2R8	4				-
C	S5R5	7.9				-
	S7R6	9.6	GTVE15008	GTVE10008		-
D	S012	12.8				-
Three-phase 200 V						
A	S1R6	1.1	GTVE10008	GTVE05008	TVR2–4	-
	S2R8	2.3				-
C	S5R5	4.4				-
	S7R6	5.1				-
D	S012	8.0				-
E	S018	8.7				-
	S022	11.0	GTVE15008	GTVE10008		-
	S027	23.8	GTVE60010	GTVE60010		-
Three-phase 400 V						
C	T3R5	2.4	GTVE10008	GTVE05008	TVR2–4	-
	T5R4	3.6				-
D	T8R4	5.6				-
	T012	8.0				-
E	T017	12.0	TVR1.25–4	GTVE10008	TVR1.25–4	1.36
	T021	16.0	TVR2–4	GTVE10008	TNR2–4	1.36
	T026	21.0	TVR5.5–4	GTVE60010	TNR5.5–4	1.36

The following table lists the data for recommended cable lugs (manufacturer: Suzhou Yuanli Metal Enterprise Co., Ltd) for your reference.

Table 9–9 TVR2-4 cable lug

Lug Model		D (mm)	d2 (mm)	B (mm)	Dimension Drawing
TVR	1.25–4	4.0	4.3	8.0	
	2–4	4.8	4.3	8.5	
	5.5–4	6.8	4.3	9.5	

9.3 KC Certification

Figure 9-3 KC Certification Mark

The KC mark indicates compliance with ROK standards related to safety (KC) and EMC (KCC).

- The KC mark is required for engaging in commercial business (production, importation, and distribution) in the ROK.
- Machines and devices integrated with this drive must also comply with KC requirements for distribution in the ROK.
- The integrator who integrates this drive into other products and attaches KC mark to the final assembly has the responsibility of ensuring compliance with KC certification.
- Observe the following requirements to enable machines and devices integrated with this drive to comply with KC standards.

Appllicant Suzhou Inovance Technology Co., Ltd.
AC Servo Drive
Model SV680 series
Made In China
Manufacturer
Suzhou Inovance Technology Co.,Ltd.

A급기기 (업무용 방송통신기자재)
이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며,가정외의 지역에서 사용하는 것을 목적으로 합니다.

9.4 UKCA Certification

Products exported to Great Britain must carry a UKCA mark. However, the products with the CE mark can still be exported to the United Kingdom.

9.5 Functional Safety Certification

FUNKTIONALE SICHERHEIT GEPRÜFT

FUNCTIONAL SAFETY APPROVED

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

10 Maintenance

10.1 Routine Maintenance Items

The required operating conditions are as follows: Average ambient temperature: 30°C Average load rate: Below 80% Daily operating time: Below 20 hours

10.1.1Routine Inspection

Check the following items during routine inspection.

Table 10–1 Routine checklist

No.	Routine Inspection	Yes
1	The ambient temperature and humidity are normal. There is no dust or unwanted objects in the servo drive.	☐
2	There is no abnormal vibration or noise.	☐
3	The voltage of the power supply is normal.	☐
4	There is no strange smell.	☐
5	There are no fibers adhered to the air inlet.	☐
6	There is no intrusion of unwanted object on the load end.	☐

10.1.2Routine Cleaning

Check the following items during routine cleaning.

Table 10–2 Routine cleaning list

No.	Routine Cleaning	Yes
1	Clean the dust on the equipment surface, especially the metallic dust.	☐
2	Keep the front end of the servo drive and the connectors clean.	☐

Note

- Before cleaning, switch off the power supply and clean with an air gun or a piece of dry cloth.
- Do not use gasoline, dilutes, alcohol, or acid or alkaline detergent to prevent enclosure discolor or damage.

10.2 Periodic Inspection Items

10.2.1Periodic Inspection Items

Table 10–3 Periodic checklist

No.	Item	Yes
1	The screws used to fix the couplings between devices are in place.	☐
2	There is no sign of overheating.	☐
3	Terminal blocks are in good condition without any sign of damage.	☐
4	The clamping units of terminal blocks are in place.	☐

10.2.2Periodic Maintenance

The electrical and electronic parts inside the servo drive may be mechanically worn out and degraded. To keep the servo drive in good condition, perform parts replacement based on the replacement cycles listed in the following table. Contact Inovance or your Inovance agent to check whether the parts need to be replaced.

<table>
<tr><th>Object</th><th>Type</th><th>Standard Replacement Interval</th><th>Remarks</th></tr>
<tr><td rowspan="7">Drive</td><td>Power bus capacitor</td><td>About 8 years (ambient temperature: 30°C; load rate: 80%; uptime per day: 20 hours; standard environment[1])</td><td rowspan="7">The standard replacement interval is for reference only. If any device/component works improperly before the replacement interval expires, replace it immediately.</td></tr>
<tr><td>Fan</td><td>5 years (ambient temperature: 30°C; load rate: 80%; uptime per day: 20 hours; standard environment[1])</td></tr>
<tr><td>Control circuit aluminum electrolytic capacitor</td><td>About 10 years (ambient temperature: 30°C; load rate: 80%; uptime per day: 20 hours; standard environment[1])</td></tr>
<tr><td>Pre-charge relay</td><td>100000 operations (depending on the operating conditions)</td></tr>
<tr><td>Pre-charge resistor</td><td>20000 operations (depending on the operating conditions)</td></tr>
<tr><td>Dynamic brake relay</td><td rowspan="2">About 1000 times (rated motor speed; interval: 5 min; inertia: 20 times)</td></tr>
<tr><td>Dynamic brake resistor</td></tr>
</table>

Note

[1]: For details on the standard environment, see *"3.3.1 Installation Environment Requirements" on page 66*.

11 Service and Support

Downloads

User guides, brochures, certificates, 2D/3D drawings and other information can be downloaded in the following way:

Go to our official website *https://www.inovance.com*, choose **Service and Support** > **Download**, enter keywords, and download the documentation.

Pre-sales consulting

We are honored to have you as our client. You can submit basic information to us in the following way, so that we can reach you as soon as possible. We are committed to your privacy. We will never share your information with any third party.

Go to our official website (*https://www.inovance.com*), choose **Service and Support** > **Contact Us**, and submit your information.

After-sales service

If you have product quality problems and need after-sales service, or you need to purchase spare parts, you can get the after-sales service person in your region through the following way.

Go to our official website (*https://www.inovance.com*), choose **Service and Support > After-sales Service**, and submit the product category and your region.

Repair

If a product is faulty and needs to be repaired, you can check the maintenance instructions, submit the service request and check the service record in the following way.

Go to our official website (*https://www.inovance.com*), choose **Service and Support** > **Repair**, and submit the repair request.

Authentication

You can authenticate Inovance products in the following way.

Go to our official website (*https://www.inovance.com*), choose **Service and Support** > **Authentication**, and enter the 16-digit serial number.

Feedback

You can submit your feedback in the following way.

Go to our official website *https://www.inovance.com*, choose **Service and Support** > **Feedback**, and submit your feedback.

INOPlanet

InoPlanet provides high-quality courses for beginners and advanced learners. You are free to learn and share there. To get access to the platform:

Go to our official website *https://www.inovance.com* and choose **Service and Support** > **INOPlanet**.

Product Announcement

You can learn about the life cycle of Inovance products in the following way.

Go to our official website (*https://www.inovance.com*) and choose **Service and Support > Product Announcement**.

Authorized Channel

Choose authorized channels and partners when purchasing Inovance products. You can query and verify Inovance authorized channels in the following way.

Go to our official website *https://www.inovance.com* and choose **Service and Support** > **Authorized Channel**.

Video

Find product courses on different scenarios including unpacking, installation, wiring, and software operations. You are free to comment and share there. To get access to the **Video**:

Go to our official website (*https://www.inovance.com*) and choose **Service and Support** > **Video**.

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