# M6-F Series Servo System

# User Manual

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**Shenzhen Megmeet Electrical Co., Ltd.** provides comprehensive technical support for our valued customers. Please contact your nearest Megmeet office or service center, or connect directly with Megmeet headquarters if any assistance is needed.

### Shenzhen Megmeet Electrical Co., Ltd.

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# Foreword

Thank you for choosing Megmeet M6-F Series Servo System.

M6-F series servo system is engineered on an innovative hardware-design platform, and adopts the latest generation of control algorithms. It delivers comprehensive functionality and superb performance based on a compact layout, and offers incomparable convenience in installation, commissioning, and maintenance, making this series highly cost-efficient for the OEM and general-purpose servo drive markets. All models support PROFINET communication protocol and multi-servo-system topology when coordinated with the host device. Key functions, such as rigidity setting, inertia identification, and vibration suppression, further enhance the ease of use in industrial sectors that require fast and precise control of position, speed, and torque, including machine tool servo feed axis, printing machine, textile processing machine, cutting machine, manipulator, punching press, semiconductor welding machine, etc.

M6-F series delivers faster response and higher precision when working with low-inertia servo motors, and higher mechanical time constant and operation stability with mid-to-high inertia servo motors. This series also supports 23-bit multi-turn absolute encoders and incremental encoders.

This user manual provides instructions and precautions for the installation, wiring, parameter setting, and fault diagnosis/removal of the product. To ensure the correct installation and operation of the M6-F series servo system and maximize its capabilities, please read this manual thoroughly before installation. This manual shall be kept properly and delivered to the actual users of the product.

### Unboxing inspection

When unboxing the product, please make sure to check the following:

- whether there is any damage to the product;
- Whether the rotating shaft of the servo motor rotates smoothly (except for the motor with brake);
- Whether the servo drive and the rated values on the nameplate are consistent with your order requirement;
- Whether there is any damage to the cables and wiring, and whether the cables and wiring can work properly.

Our company has implemented strict inspection on the product's manufacturing and packaging. If there is still any error, please contact us or the local distributor.

We are engaged in the continuous improvement of our servo drive products. The relevant manuals provided by us are subject to changes without notice.

### Safety precautions



Indicates that failure to comply with the notice can result in death or severe personal injuries.



Indicates that failure to comply with the notice may result in moderate or minor personal injuries, or property damages.



- Install the product on incombustible materials such as metal. Failure to comply will result in a fire.
- Do not place combustible objects near the installed product. Failure to comply will result in a fire.
- Do not install the product in places with explosive gases. Failure to comply will result in an explosion.
- The wiring work must be carried out by sufficiently qualified personnel. Otherwise, there is a risk
  of electric shock.
- Before wiring, make sure that the power supply input is completely cut off. Otherwise, there is a risk of electric shock.
- Make sure to reliably ground the servo drive. Otherwise, there is a risk of electric shock.
- Properly install the covers of the drive enclosure before powering on. Otherwise, there is a risk of electric shock and explosion.
- When powering on a drive product that has been idle/stored for more than 2 years, employ a
  voltage regulator to gradually turn up the input voltage to the required level. Otherwise, there is a
  risk of electric shock or explosion.
- Do not touch any terminals with bare hands when the drive is powered on. Otherwise, there is a risk of electric shock.
- Do not operate the servo drive with wet hands. Otherwise, there is a risk of electric shock.
- Before maintenance, make sure the drive has been powered off for at least 10 minutes, and that the charging indicator is completely off or the bus negative/positive voltage is below 36 V. Failure to comply will result in an electric shock.
- Parts/Components replacement must be carried out by sufficiently qualified personnel. Do not leave any wire residue or foreign metal inside the drive. Failure to comply will result in a fire.
- The bare parts of the terminal lugs in the main circuit must be properly wrapped with insulation tape. Otherwise, electric shock may occur.



- Install the product on a place that can bear its weight. Failure to comply will result in personal injuries or equipment damage.
- Do not install the drive near water pipes or other places capable of water splashing. Otherwise, there is a risk of property damage.
- Do not allow screws, gaskets, metal bars, and the like to fall into the servo drive. Failure to comply may result in a fire or property damage.
- If the servo drive is damaged or lacks components, do not install or run the drive. Failure to comply may result in a fire or personal injuries.
- Do not install the product in places with direct sunlight exposure. Otherwise, there is a risk of property damage.
- Cable lugs must be firmly connected to the terminals of the main circuit. Otherwise, there is a risk
  of property damage.
- When handling the servo motor, do not drag the machine by pulling the cables or holding the rotating shaft. Otherwise, there is a risk of machine dropping that may cause personal injuries or property damage.
- Do not impact the shaft with direct striking or pounding as such actions may cause damage to the shaft and the encoder attached to the opposite side of the shaft. Failure to comply may result in property damage.
- Do not store the servo motor in the place with vibration beyond the limit in the requirement. Otherwise, there is a risk of property damage.

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## Chapter 1 M6-F Series Model Selection

### 1.1 Servo motor and drive models

### 1.1.1 Servo motor model

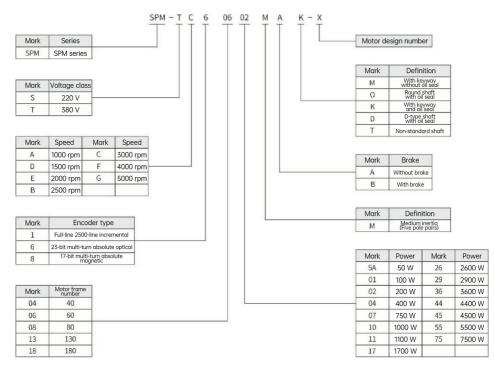


Figure 1-1 Servo motor model explanation

### 1.1.2 Servo motor nameplate

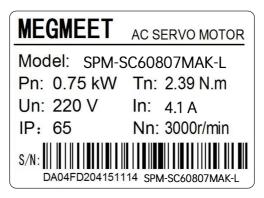


Figure 1-2 Servo motor nameplate

### 1.1.3 Servo drive model

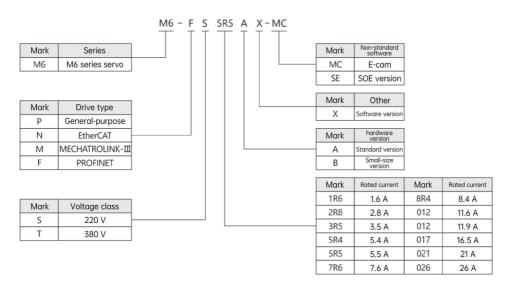


Figure 1-3 Servo drive model explanation

### 1.1.4 Servo drive nameplate

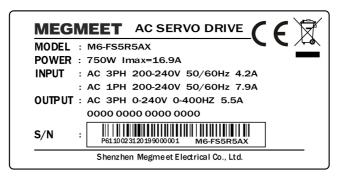


Figure 1-4 M6-F series servo drive nameplate

### 1.1.5 Names and descriptions of the drive interface

Interface name	Interface description
CN5	Used for the connection with the
Micro USB	computer USB to facilitate the drive
communication	parameter setting and
port	commissioning
	Five-digit eight-segment digital
LED digital tube	tube for status monitoring and
Ū	parameter display & setting
	Five keys, used for parameter
Operating key	setting and display status
	switchover
	Used for indicating the status of
	the bus power supply. When the
	indicator is on, it indicates that the
CHARGE	bus capacitor is charged; do not
Bus power	touch the power supply terminal in
supply indicator	the circumstances even if the main
	power supply has been cut off;
	otherwise, there is a risk of electric
	shock.
L1, L2, L3	Main power supply input, 220 V or
Main power	380 V, single-phase or three-
supply input	phase. Refer to the section 2.1.1 for
	detailed specifications.
L1C, L2C	Single-phase 220 V control power
Control power	supply input
supply input	
$\ominus$ , P $_{\odot}$	DC bus terminal, for connection
DC bus terminal	under common bus
	Braking resistor wiring terminals.
P⊚, PB, IR	Please short-circuit PB and IR when
Braking resistor	an internal braking resistor is
wiring terminal	applied; when an external braking
-	resistor is applied, install it
U. V. W	between P⊕ and PB.
Servo motor	Servo motor UVW power terminals
power terminal	Cround terminal Diagon short
	Ground terminal. Please short-
Ground terminal	circuit to ground and the motor
CN4	DB15 female connector for
Encoder	connecting the motor encoder
interface	
CN3	DB44 female connector, control I/O
Control I/O	interface, used for connecting with
interface	the external I/O and the host
011 010	controller
CN1、CN2	Two RJ45 ports in parallel for
Communication	Profinet communication
interface	

### 1.2 Servo system configuration specifications

Voltage	Rated speed (rpm)	Max. speed (rpm)	Power (W)	Motor	Rated torque (N·m)	Motor frame number	Matching drive	Drive size
	3000	6000	50	SPM-SC6045AM**-L	0.16	40	M6-*S1R6AX	А
	3000	6000	50	SPM-SC8045AM**-L	0.16	40	M6-*S1R6AX	А
	3000	6000	100	SPM-SC60401M**-L	0.32	40	M6-*S1R6AX	А
	3000	6000	100	SPM-SC80401M**-L	0.32	40	M6-*S1R6AX	А
	3000	6500	200	SPM-SC60602M**-L	0.64	60	M6-*S1R6AX	А
	3000	6500	200	SPM-SC80602M**-L	0.64	60	M6-*S1R6AX	А
	3000	5000	400	SPM-SC60604M**-L	1.27	60	M6-*S2R8AX	А
220 V	3000	5000	400	SPM-SC80604M**-L	1.27	60	M6-*S2R8AX	А
	3000	5000	750	SPM-SC60807M**-L	2.39	80	M6-*S5R5AX	А
	3000	5000	750	SPM-SC80807M**-L	2.39	80	M6-*S5R5AX	А
	3000	5000	1000	SPM-SC60810M**-L	3.19	80	M6-*S7R6AX	А
	3000	5000	1000	SPM-SC80810M**-L	3.19	80	M6-*S7R6AX	А
	3000	5000	1700	SPM-SC61317M**-W	5.399	130	M6-*S012AX	В
	2000	4000	1100	SPM-SE61311M**-W	5.39	130	M6-*S7R6AX	В
	2000	4000	1700	SPM-SE61317M**-W	8.34	130	M6-*S012AX	В

Table 1-1 220 V medium-inertia servo motor configuration specifications

Table 1-2 380V medium-inertia servo motor configuration specifications

Voltage	Rated speed (rpm)	Max. speed (rpm)	Power (W)	Motor	Rated torque (N∙m)	Motor frame number	Matching drive	Drive size
	2000	4000	1100	SPM-TE61311M**-W	5.39	130	M6-*T5R4AX	В
700.14	2000	4000	1700	SPM-TE61317M**-W	8.34	130	M6-*T8R4AX	В
380 V	2000	4000	2400	SPM-TE61324M**-W	9.5	130	M6-*T017AX	С
	2000	4000	3000	SPM-TE61330M**-W	14.3	130	M6-*T017AX	С

Voltage	Rated speed (rpm)	Max. speed (rpm)	Power (W)	Motor	Rated torque (N∙m)	Motor frame number	Matching drive	Drive size
	3000	5000	1700	SPM-TC61317M**-W	5.399	130	M6-*T8R4AX	В
	3000	5000	2600	SPM-TC61326M**-W	8.34	130	M6-*T012AX	В
	3000	5000	3600	SPM-TC61336M**-W	11.5	130	M6-*T012AX	В
	3000	5000	4500	SPM-TC61345M**-W	14.3	130	M6-*T017AX	С
	1500	3000	2900	SPM-TD11829M**-P	18.6	180	M6-*T012AX	В
	1500	3000	2900	SPM-TD61829M**-P	18.6	180	M6-*T012AX	В
	1500	3000	4400	SPM-TD11844M**-P	28.4	180	M6-*T017AX	С
	1500	3000	4400	SPM-TD61844M**-P	28.4	180	M6-*T017AX	С
	1500	3000	5500	SPM-TD11855M**-P	35	180	M6-*T021AX	С
	1500	3000	5500	SPM-TD61855M**-P	35	180	M6-*T021AX	С
	1500	3000	7500	SPM-TD11875M**-P	48	180	M6-*T026AX	С
	1500	3000	7500	SPM-TD61875M**-P	48	180	M6-*T026AX	С

### 1.3 Matching cables

The selection of matched cables for the servo system is listed below.

Table 1-3	Servo	system	cable	selection
Tuble 1.5	00100	System	CUDIC	3010011

Cable name	Cable model	Cable diagram
Main motor cable (Frame number 60/80)	SPL-MA04-xx-x	
Main motor cable (Frame number 60/80)	SPL-MA01-xx-x	Red - UL + 10mm Yellow - UV Blue - WW Yellow/ Green - PE

Cable name	Cable model	Cable diagram
Main motor cable (Frame number 130)	SPL-MC04-xx-x	Lobel
Main motor cable (Frame number 180)	SPL-MD01-xx-x	100±10 100±10
Main motor cable (Frame number 180)	SPL-MD02-xx-x	Lobel
Single-turn absolute encoder cable	SPL-E09-xx-x	
Multi-turn absolute encoder cable	SPL-E07-xx-x	
23-bit absolute encoder cable (Frame number 60/80)	SPL-E01-xx-x	LL±30mm
23-bit absolute encoder cable (Frame number 130/180, medium-inertia)	SPL-E02-xx-x	
Incremental encoder cable (Frame number	SPL-E11-xx-x	

Cable name	Cable model	Cable diagram
60/80)		
Incremental encoder cable (Frame number 130/180, medium-inertia)	SPL-E12-xx-x	
Brake cable (Frame number 60/80)	SPL-B01-xx-x	
Brake cable (Frame number 130/180, medium-inertia)	SPL-B02-xx-x	
Brake/Power integrated cable (Frame number 130, medium-inertia)	SPL-BMC04-xx-x	

No.	Model	Name	Description	Length	Diameter (mm²)
1	SPL-MA04-xx-x		Main motor cable; AMP female connector at the motor side	3 m / 5 m / 10 m	0.75
2	SPL-MA01-xx-x		Main motor cable; straight-pin aviation plug at the motor side	3 m / 5 m / 10 m	0.75
3	SPL-MC04-xx-x	Main motor cable (Frame number 130)	Main motor cable; straight-pin aviation plug at the motor side	3 m / 5 m / 10 m	1.0
4	SPL-MD01-xx-x	Main motor cable (Frame number 180)	AMP 4-pin female connector at one end, and straight-type terminal (size B) at the other end	3 m / 5 m / 10 m	1.5
5	SPL-MD02-xx-x	Main motor cable (Frame number 180)	AMP 4-pin female connector at one end, and U-type terminal (size C) at the other end	3 m / 5 m / 10 m	2.5

No.	Model	Name	Description	Length	Diameter (mm²)
6	SPL-E09-xx-x	Single-turn absolute encoder cable	3-row 15-pin DB male connector at one end, and 3-row 7-pin AMP female connector at the other end	3 m / 5 m / 10 m	_
7	SPL-E07-xx-x	Multi-turn absolute encoder cable	3-row 15-pin DB male connector at one end, and 3-row 7-pin AMP female connector at the other end	3 m / 5 m / 10 m	_
8	SPL-E01-xx-x	23-bit absolute encoder cable (Frame number 60/80)	3-row 15-pin DB male connector at one end, and 3-row 15-pin DB male connector at the other end	3 m / 5 m / 10 m	_
9	SPL-E02-xx-x	23-bit absolute encoder cable (Frame number 130/180, medium-inertia)	3-row 15-pin DB male connector at one end, and 10-pin aviation female connector at the other end	3 m / 5 m / 10 m	_
10	SPL-E11-xx-x	Incremental encoder cable (Frame number 60/80)	3-row 15-pin DB male connector at one end, and 3-row 15-pin DB male connector at the other end	3 m / 5 m / 10 m	_
11	SPL-E12-xx-x	Incremental encoder cable (Frame number 130/180, medium-inertia)	3-row 15-pin DB female connector at one end, and 15-pin aviation connector (SUNCHU) at the other end	3 m / 5 m / 10 m	_
12	SPL-B01-xx-x	Brake cable (Frame number 60/80)	AMP 2-pin female connector at one end, and straight-type terminal at the other end	3 m / 5 m / 10 m	0.5
13	SPL-B02-xx-x	Brake cable (Frame number 130/180, medium-inertia)	3-pin female straight-type aviation plug at one end, and straight-type terminal at the other end	3 m / 5 m / 10 m	0.5
14	SPL-BMC04-xx-x	-	Main motor cable; straight-pin aviation plug at the motor side; with brake	3 m / 5 m / 10 m	1.0

#### Note:

The mark "xx" indicates the cable length; "x" indicates the flexible wire, which refers to the flexible wire (5-million bends) when marked with "R1" and the flexible wire (10 million bends) when marked with "R2".

# Chapter 2 Servo System Specifications

### 2.1 Standard specifications of servo drives

### 2.1.1 Electrical specifications of servo drives

#### 220 V class servo drive models and electrical specifications

Tabel 2-1 Models and electrical specifications of 220 V class servo drives

Voltage class	220 V					
Model	FS1R6AX FS2R8AX		FS5R5AX	FS7R6BX	FS7R6AX	FS012AX
Power class	200 W	400 W	750 W	1 kW	1 kW	1.5 kW
Size		ç	SIZE A		SIZ	ΕB
Phase	Single	-phase	Single-phase, three-phase	Three-phase		
Rated input current (A)	2.2	4	7.6/4.2	5.1	5.1	8
Rated output current (A)	1.6	2.8	5.5	7.6	7.6	11.6
Max. output current (A)	5.8	9.3	16.9	17	22	28
Main circuit power supply	200 to 24	0 V, -10% to +	+10%, 50/60 Hz	200 to 240	V, -15% to +10	%, 50/60 Hz
Control circuit power supply	Single-phase, 200 to 240 V, -15% to +10%, 50/60 Hz					
Braking resistor		in braking istor		Built-in brakin	ıg resistor	

#### 380 V class servo drive models and electrical specifications

Tabel 2-2 Models and electrical specifications of 380 V class servo drives

Voltage class	380 V						
Model	FT3R5AX	FT5R4AX	FT8R4AX	FT012AX	FT017AX	FT021AX	FT026AX
Power class	0.85 kW	1.3 kW	2.0 kW	2.9 kW	4.4 kW	5.5 kW	7.5 kW

Size	SIZE B					SIZE C	
Phase			TI	hree-phase			
Rated input current (A)	2.4	3.6	5.5	8	12	16	21
Rated output current (A)	3.5	5.4	8.4	11.9	16.5	21	26
Max. output current (A)	8.5	14	22	28	42	55	65
Main circuit power supply	Three-phase, 380 to 440 V, -15% to +10%, 50/60 Hz						
Control circuit power supply	Single-phase, 200 to 240 V, -15% to +10%, 50/60 Hz						
Braking resistor		Built-in brakiı	ng resistor		No buil	t-in braking	resistor

### 2.1.2 Basic specifications of servo drives

### Tabel 2-3 Basic specifications of servo drives

	Basic specifications							
_	Со	ntrol mode	IGBT, PWM control, and sine wave current drive mode					
Basic			Absolute encoder					
spec	5	Rotary motor	Incremental encoder (Full-line, line-saving)					
specifications	Encoder		Sin/Cos encoder (Under development)					
ons		Linear motor	Absolute encoder, incremental encoder, and sin/cos encoder (Under development)					
Contr	DI D		Four channels of general input, optocoupler isolation, NPN and PNP inputs for selection Input voltage ranging from 20 to 30 V; input impedance of 3.9 K					
Control I/O	DO	Various functions	Three channels of general output, optocoupler isolation, NPN and PNP outputs for selection					
		defined by parameters	Operating voltage up to 30 V, current up to 100 mA					

	RS485	Modbus communication protocol, available for M6-P series only
	CAN	CANopen communication protocol, in compliance with CiA 402 profile, available for M6-P series only
Comm	EtherCAT	CoE and SoE communication protocols, in compliance with CiA 402 profile, available for M6-N series only
Communication	MECHATROLINK-III	MECHATROLINK-III bus communication protocol, available for M6-M series only
د	PROFINET	PROFINET bus communication protocol, with PROFIdrive profile integrated, available for M6-F series only
	USB port	For connection between the computer and the servo drive to facilitate servo commissioning and tuning
	Кеу	Five keys
Other terminals	LED display	Five-digit eight-segment LEDs
, tern	Power indication	CHARGE indicator
ninals	Safety function	General STO function, optional
	Expansion card port	For expansion of motion-control card
	Automatic adjustment	The host computer outputs an action command to run the motor, during which the load's moment of inertia ratio is estimated in real time and the rigidity level is automatically set.
	Multiple control modes switchover	Position mode; speed mode; torque mode; position/speed mode switchover; speed/torque mode switchover; position/torque mode switchover, PROFINET mode
General functions	Protection function	Overvoltage, undervoltage, overcurrent, overspeed, stall, overheat, overload, encoder abnormality, input phase loss, excessive position deviation
nctions	High-frequency vibration suppression	Four sets of notch filters for the suppression of vibration between 0 and 4000 Hz; one set of speed reference filter for the suppression of vibration between 0 and 1000 Hz
	End vibration suppression	Two sets of filters for the suppression of low-frequency end vibration between 1 and 100 Hz
	Homing mode	Multiple homing modes
	Gantry control	Gantry synchronization

	Reverse clearance compensation	Used to minimize the response delay when the traveling direction of the machine is reversed				
	Mechanical analyzer	Used for analyzing the frequency characteristics of the mechanical system via the host computer software				
	Inertia identification	Offline and online identification of system inertia				
	Torque observer	Load torque obse	ervation and co	ompensation		
	E-cam	512-point electro	nic cam curve			
	Friction compensation	System friction c	ompensation			
Po	Control input	Deviation counte	eviation counter reset, electronic gear switchover, etc.			
sition	Control output	Positioning comp	leted			
Position contro	Position reference	PROFINET	PROFINET			
rol	FOSILIOITTETETETICE	Electronic gear	Four sets of electronic gear ratio; online			
	Performance		Load variation rate	0 to 100% load: Below 0.5% (at the rated speed)		
		Speed variation rate	Voltage variation rate	Rated voltage ±10%: 0.5% (at the rated speed)		
S			Temperature variation rate	25 ±25°C: below 0.5% (at the rated speed)		
Speed contro		Speed control range	1 to 6000			
ntrol		Speed-loop response characteristics	2.6 kHz			
		Soft start time	0 to 6000 ms			
	Control input	Internal speed command selection 1/2/3/4, zero speed clamp, etc.				
	Control output	Speed arrival, etc	ırrival, etc.			
Con	Performance	Torque control precision	±1%			
Torque control	Performance	Frequency characteristics	3 kHz			

	Control input	Zero speed clamp, torque command symbol input, etc.		
	Control output	Speed arrival, etc.		
	Speed limit function	Set the speed limit according to parameters.		

### 2.2 Standard specifications of servo motors

### 2.2.1 Basic specifications of servo motors

	Items of basic specifications for servo motors				
IP rating	IP65				
Ambient temperature	-20°C to +40°C				
Ambient humidity	Relative humidity <90% (Frost-free)				
Installation method	Flange mounting				
Insulation resistance	50 MΩ (500 V)				
Insulation voltage	1500 V (220 V motor)				
Insulation voltage	1800 V (380 V motor)				
Insulation class	F				
Altitude	Normal use under 1000 m; derated use above 1000 m				
	The product shall be installed in an open place free from				
	corrosive/flammable/explosive gases and liquids;				
Installation site	Motors with the oil seal shall be selected for places with metal powder, grinding fluid, oil mist, and cutting fluid, etc.;				
	It is forbidden to use the motor in enclosed high-temperature environments as such conditions would significantly impact the service life of the motor.				

#### Tabel 2-4 Basic specifications of servo motors

### 2.2.2 Rated specifications of servo motors

Motor model	Rated voltage (V)	Rated power (W)	Rated speed (rpm)	Max. Speed (rpm)	Rated torque (N·m)	Peak torque (N·m)	Rated current (A)	Peak current (A)	Rotor inertia (10 <sup>-4</sup> kg·m <sup>2</sup> )
SPM-SC6045AM**-L	220	50	3000	6000	0.16	0.48	0.93	2.88	0.036 (0.046)
SPM-SC8045AM**-L	220	50	3000	6000	0.16	0.48	0.93	2.88	0.036 (0.046)
SPM-SC60401M**-L	220	100	3000	6000	0.32	0.95	0.92	2.85	0.062 (0.072)
SPM-SC80401M**-L	220	100	3000	6000	0.32	0.95	0.92	2.85	0.062 (0.072)
SPM-SC60602M**-L	220	200	3000	6500	0.64	1.91	1.5	4.66	0.28 (0.3)
SPM-SC80602M**-L	220	200	3000	6500	0.64	1.91	1.5	4.66	0.28 (0.3)
SPM-SC60604M**-L	220	400	3000	5000	1.27	3.81	2.1	6.5	0.56 (0.58)
SPM-SC80604M**-L	220	400	3000	5000	1.27	3.81	2.1	6.5	0.56 (0.58)
SPM-SC60807M**-L	220	750	3000	5000	2.39	7.17	4.1	13.4	1.5 (1.65)
SPM-SC80807M**-L	220	750	3000	5000	2.39	7.17	4.1	13.4	1.5 (1.65)
SPM-SC60810M**-L	220	1000	3000	5000	3.19	9.56	5.7	17.7	2 (2.15)
SPM-SC80810M**-L	220	1000	3000	5000	3.19	9.56	5.7	17.7	2 (2.15)

Tabel 2-5 Standard specifications of frame 40/60/80 medium-inertia servo motors

Tabel 2-6 Standard specifications of frame 130/180 medium-inertia servo motors

Motor model	Rated voltage (V)	Rated power (W)	Rated speed (rpm)	Max. Speed (rpm)	Rated torque (N∙m)	Peak torque (N·m)	Rated current (A)	Peak current (A)	Rotor inertia (10 <sup>-4</sup> kg·m <sup>2</sup> )
SPM-SE61311M**-W	220	1100	2000	4000	5.39	16.17	7.5	22.5	10.9 (12.3)
SPM-SE61317M**-W	220	1700	2000	4000	8.34	25.22	12	36	16.9 (18.3)
SPM-SC61317M**-W	220	1700	3000	5000	5.399	10.78	9.5	19	10.9 (12.3)
SPM-TE61311M**-W	380	1100	2000	4000	5.39	16.17	4.5	13.5	10.9 (12.3)
SPM-TE61317M**-W	380	1700	2000	4000	8.34	25.2	6.6	19.8	16.9 (18.3)
SPM-TE61324M**-W	380	2400	2000	4000	9.5	28.5	11.5	34.5	21.4 (22.6)
SPM-TE61330M**-W	380	3000	2000	4000	14.3	40	11.5	32.2	27.1 (28.4)

Motor model	Rated voltage (V)	Rated power (W)	Rated speed (rpm)	Max. Speed (rpm)	Rated torque (N·m)	Peak torque (N·m)	Rated current (A)	Peak current (A)	Rotor inertia (10 <sup>-4</sup> kg·m <sup>2</sup> )
SPM-TC61317M**-W	380	1700	3000	5000	5.399	10.78	9.5	19	10.9 (12.3)
SPM-TC61326M**-W	380	2600	3000	5000	8.34	16.7	9.5	19	16.9 (18.3)
SPM-TC61336M**-W	380	3600	3000	5000	11.5	23	12	24	18.3 (21.4)
SPM-TC61345M**-W	380	4500	3000	5000	14.3	28.6	14.5	29	27.1 (28.4)
SPM-TD11829M**-P	380	2900	1500	3000	18.6	54	11.9	34.5	44 (59)
SPM-TD61829M**-P	380	2900	1500	3000	18.6	54	11.9	34.5	44 (59)
SPM-TD11844M**-P	380	4400	1500	3000	28.4	71	16.5	41.3	66 (80)
SPM-TD61844M**-P	380	4400	1500	3000	28.4	71	16.5	41.3	66 (80)
SPM-TD11855M**-P	380	5500	1500	3000	35	87.5	21	52.5	102 (110)
SPM-TD61855M**-P	380	5500	1500	3000	35	87.5	21	52.5	102 (110)
SPM-TD11875M**-P	380	7500	1500	3000	48	96	25.5	51	146 (156)
SPM-TD61875M**-P	380	7500	1500	3000	48	96	25.5	51	146 (156)

#### Note:

The parameters in parentheses are the parameters of the motor with brake.

### 2.3 Servo drive outline and dimensions

1. SIZE A (Applicable for drive models: FS1R6AX, FS2R8AX, FS5R5AX, FS7R6BX)

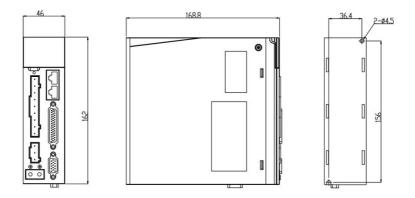


Figure 2-1 SIZE A outline and dimensions

2. SIZE B (Applicable for drive models: FS7R6AX, FS012AX, FT3R5AX, FT5R4AX, FT8R4AX, FT012AX)

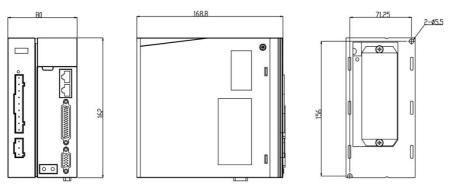


Figure 2-2 SIZE B outline and dimensions

3. SIZE C (Applicable for drive models: FT017AX, FT021AX, FT026AX)

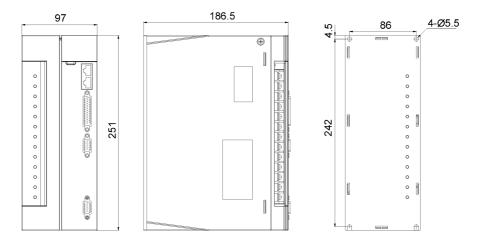


Figure 2-3 SIZE C outline and dimensions

- 2.4 Servo motor outline, dimensions, and interface definitions
- 2.4.1 Frame No. 40 medium-inertia servo motor
- 2.4.1.1 Outline and dimensions

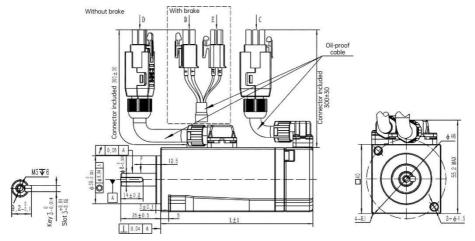


Figure 2-4 Outline and dimensions of frame No. 40 medium-inertia servo motor

Model	L (mm)
SPM-SC6045AM**-L	56 (84)
SPM-SC8045AM**-L	56 (84)
SPM-SC60401M**-L	67.7 (95)
SPM-SC80401M**-L	67.7 (95)

Tabel 2-7 Dimensions of frame No. 40 medium-inertia servo motor

#### Note:

The parameters in parentheses are the parameters of the motor with brake.

#### 2.4.1.2 Interface definitions



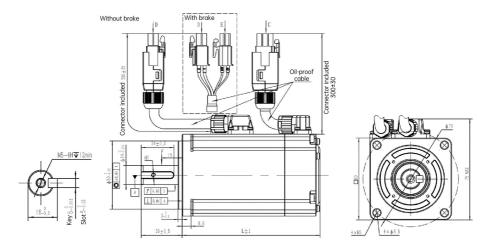
Motor power terminal interface definitions			
Signal	Pin		
U	1		
V	3		
W	2		
PE	4		

Motor brake terminal interface definitions				
Signal	Pin			
24 V	1			
GND	2			



Interface definition of the absolute encoder terminal				
Signal	Pin			
E- (Battery-)	7			
E+ (Battery+)	6			
SD+	4			
SD-	5			
GND	3			
5 V	2			
PE	1			

### 2.4.2 Frame No. 60 medium-inertia servo motor



#### 2.4.2.1 Outline and dimensions

Figure 2-5 Outline and dimensions of frame No. 60 medium-inertia servo motor

Tabel 2-8 Dimensions of frame No. 60 medium-inertia servo moto	٥r
--	----

Model	L (mm)
SPM-SC60602M**-L	71.8 (101.2)
SPM-SC80602M**-L	71.8 (101.2)
SPM-SC60604M**-L	88.8 (118.2)
SPM-SC80604M**-L	88.8 (118.2)

#### Note:

The parameters in parentheses are the parameters of the motor with brake.

#### 2.4.2.2 Interface definitions



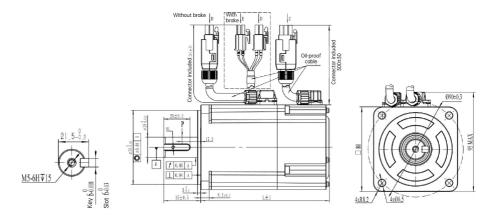
Motor power terminal interface definitions			
Signal	Pin		
U	1		
V	3		
W	2		
PE	4		

Motor brake terminal interface definitions				
Signal	Pin			
24 V	1			
GND	2			



Interface definition of the absolute encoder terminal					
Signal	Pin				
E- (Battery-)	7				
E+ (Battery+)	6				
SD+	4				
SD-	5				
GND	3				
5 V	2				
PE	1				

### 2.4.3 Frame No. 80 medium-inertia servo motor



#### 2.4.3.1 Outline and dimensions

Figure 2-6 Outline and dimensions of frame No. 80 medium-inertia servo motor

Tabel 2-9 Dimensions of frame No. 80 medium-inertia servo motor

Model	L (mm)
SPM-SC60807M**-L	90 (121.9)
SPM-SC80807M**-L	90 (121.9)
SPM-SC60810M**-L	103.9 (134.9)
SPM-SC80810M**-L	103.9 (134.9)

#### Note:

The parameters in parentheses are the parameters of the motor with brake.

2.4.3.2 Interface definitions



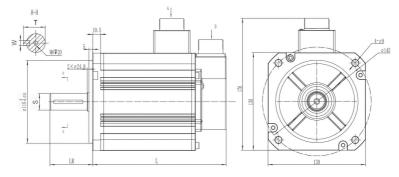
Motor power terminal interface definitions					
Signal	Pin				
U	1				
V	3				
W	2				
PE	4				

Motor brake terminal interface definitions					
Signal	Pin				
24 V	1				
GND	2				



Interface definition of the absolute encoder terminal					
Signal	Pin				
E-(Battery-)	7				
E+(Battery+)	6				
SD+	4				
SD-	5				
GND	3				
5 V	2				
PE	1				

### 2.4.4 Frame No. 130 medium-inertia servo motor



#### 2.4.4.1 Outline and dimensions



Model	L (mm)	LR (mm)	∳S (mm)	W (mm)	T (mm)
SPM-SE61311M**-W	135 (187)	57	22	6	24.5
SPM-SE61317M**-W	152.5 (204)	57	22	6	24.5
SPM-SC61317M**-W	135 (187)	57	22	6	24.5
SPM-TE61311M**-W	135 (187)	57	22	6	24.5
SPM-TE61317M**-W	152.5 (204)	57	22	6	24.5
SPM-TE61324M**-W	170 (222)	57	22	6	24.5
SPM-TE61330M**-W	200 (252)	57	22	6	24.5
SPM-TC61317M**-W	135 (187)	57	22	6	24.5
SPM-TC61326M**-W	152.5 (204)	57	22	6	24.5
SPM-TC61336M**-W	170 (222)	57	22	6	24.5
SPM-TC61345M**-W	200 (252)	57	22	6	24.5

#### Note:

The parameters in parentheses are the parameters of the motor with brake.

### 2.4.4.2 Interface definitions

Power cable

0	Plug model	YD28J4Z-E			
$O O_1$	Pin	1	2	3	4
o' //	Definition	PE	U	V	W

Encoder cable



Plug model	YD28J7Z-E						
Pin	1	2	3	4	5	6	7
Definition	PE	E-	E+	SD-	OV	SD+	+5v

Power terminal interface definition of the motor without brake					
Signal	Pin				
PE	1				
U	2				
V	3				
W	4				

#### Power cable



Plug model		YD28J7Z-E					
Pin	1	2	3	4	5	6	7
Definition	PE	U	Y	W	Brk+	Brk-	1

Encoder cable



Plug model	YD28J7Z-E						model YD28J7Z-E	
Pin	1	2	3	4	5	6	7	
Definition	PE	E-	E+	SD-	OV	SD+	+5v	

Power terminal interface definition of the motor with brake	
Signal	Pin
PE	1
U	2
V	3

Power terminal interface definition of the motor with brake	
Signal	Pin
W	4
24 V	5
0V	6

Interface definition of the absolute encoder terminal	
Signal	Pin
E- (Battery-)	2
E+ (Battery+)	3
SD+	6
SD-	4
0V	5
+5 V	7
PE	1

- 2.4.5 Frame No. 180 medium-inertia servo motor
- 2.4.5.1 Outline and dimensions

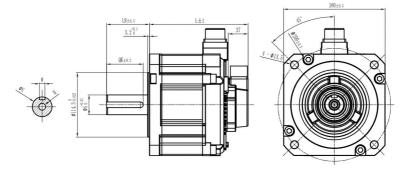


Figure 2-8 Outline and dimensions of frame No. 180 medium-inertia servo motor

Model	L (mm)	LR (mm)	ΦS (mm)	W (mm)
SPM-TD11829M**-P	176 (224)	79	35	10
SPM-TD61829M**-P	176 (224)	79	35	10
SPM-TD11844M**-P	200 (248)	79	35	10
SPM-TD61844M**-P	200 (248)	79	35	10
SPM-TD11855M**-P	237 (285)	113	42	12
SPM-TD61855M**-P	237 (285)	113	42	12
SPM-TD11875M**-P	283 (331)	113	42	12
SPM-TD61875M**-P	283 (331)	113	42	12

Tabel 2-11 Dimensions of frame No. 180 medium-inertia servo motor

The parameters in parentheses are the parameters of the motor with brake.

### 2.4.5.2 Interface definitions



Interface definition at the side of the motor with brake			
Pin Signal Color			
1	+	Blue	
2	-	Black	



Interface definition at the motor side			
Pin Signal Color			
1	FG	Yellow and green	
2	U	Red	

Interface definition at the motor side			
Pin Signal Color			
3	V	Blue	
4	W	Black	



Interface definition of full-line incremental encoder			
Pin	Signal	Color	
Enclosure	FG	Shielded cable	
1	A+	Blue	
2	A-	Blue and black	
3	B+	Green	
4	B-	Green and black	
5	Z+	Yellow	
6	Z-	Yellow and black	
7	U+	Brown	
8	U-	Brown and black	
9	V+	Gray	
10	V-	Gray and black	
11	W+	White	
12	W-	White and black	
13	5 V	Red	
14	GND	Black	
15	NC		

Interface definition of line-saving incremental encoder			
Pin	Signal	Color	
Enclosure	FG	Shielded cable	
1	A+	Blue	
2	A-	Blue and black	
3	B+	Green	
4	B-	Green and black	
5	Z+	Yellow	
6	Z-	Yellow and black	
13	5 V	Red	
14	GND	Black	

Interface definition of the absolute encoder			
Pin	Signal	Color	
Enclosure	FG	Shielded cable	
2	E-	Blue	
3	E+	Blue and black	
4	SD-	Green	
5	GND	Green and black	
6	SD+	Yellow	
7	5 V	Yellow and black	

# Chapter 3 Installation Instruction

# 3.1 Servo drive installation

### 3.1.1 Place for installation

- The product shall be installed inside a cabinet shielded from direct sunlight exposure, rain, and water dropping;
- Do not install the product in places with high temperature, high humidity, or excessive exposure to dust or metal powder;
- Do not install the product in places with corrosive, explosive, or flammable gases present;
- The place for installation shall be without vibration.

### 3.1.2 Environmental requirements for installation

	ltem	Requirements
	Place for installation	Vertical mounting on a solid and stable indoor base; at least 5 cm spacing for air inlet and outlet; at least 4 cm spacing for the right and left sides of the enclosure; air cooling
	Ambient temperature	0 to +45°C; temperature change rate less than 0.5°C/min; derated use above 45°C with adequate ventilation; max. working temperature at 55°C (Operation allowed with less than 25% load)
Operc	Humidity	Relative humidity <90% (Non-condensing)
Operating conditions	Other climate conditions	Non-condensing, non-freezing, and no rain, snow, hail, etc.; solar radiation less than 700 W/m²; air pressure ranging from 70 to 106 kPa
nditions	Salt and corrosive gas content	Pollution degree 2
	Dust and solid particle content	Pollution degree 2
	IP rating	IP20
	Altitude	Normal use below 1000 m; derated use above 1000 m; derated by 6% for each increase of 1000 m

Table 3-1 Environmental requirements for M6-F servo drive installation

Vibration resistance	Below 4.9 m/s <sup>2</sup>
Impact resistance	Below 19.6 m/s <sup>2</sup>

### 3.1.3 Installation precautions

This servo drive product shall be properly installed at an adequately-ventilated indoor location. Installation inside a cabinet is preferred. It shall adopt a vertical mounting method, and be secured to the mounting surface via the two fixing holes of the drive.

### 1. Installation drawing

• SIZE A installation requirements

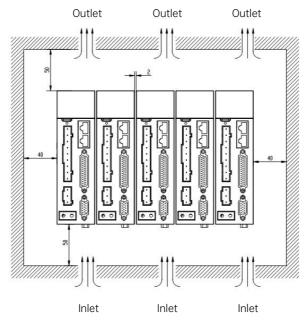


Figure 3-1 SIZE A installation drawing

### • SIZE B/C installation requirements

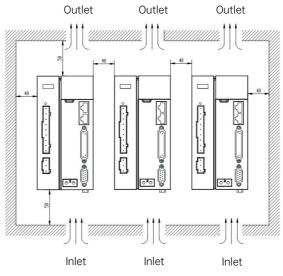


Figure 3-2 SIZE B/C installation drawing

### 2. Side-by-side installation

As shown in the two drawings above, different group installation methods shall be adopted to suit the cooling methods of different enclosures. When installed side by side, there is no need for spacing between two SIZE A models, while at least 40 mm spacing shall be applied between two SIZE B/C models.

#### 3. Convection cooling

To ensure effective cooling via natural convection and drive fans, it is required to place the air inlets on the lower cover and the air outlets on the upper cover of the cabinet inside which the drive is installed, and the exhaust fans shall be applied at the top of the cabinet. The drive models installed inside the cabinet shall be kept at least 50 mm away from the upper and lower covers.

#### 4. Grounding requirements

To ensure optimal EMC performance and prevent electric shock, the drive and motor shall be reliably grounded, and the GND terminals of both the drive and the motor shall be directly short-circuited.

3.2 System wiring diagram

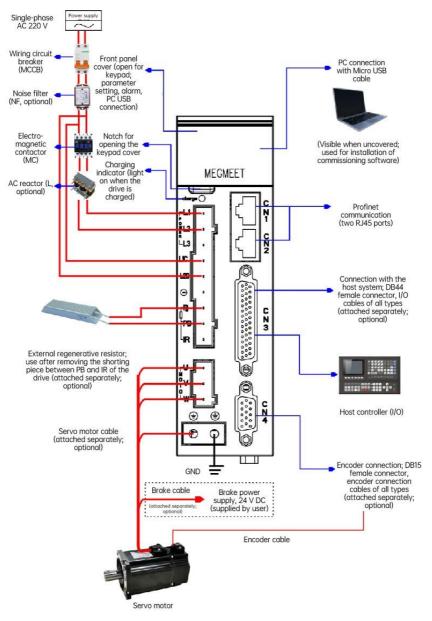


Figure 3-3 220 V single-phase servo system wiring

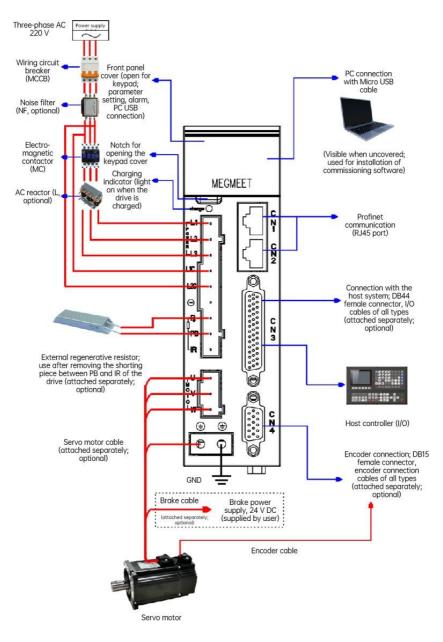


Figure 3-4 220 V three-phase servo system wiring

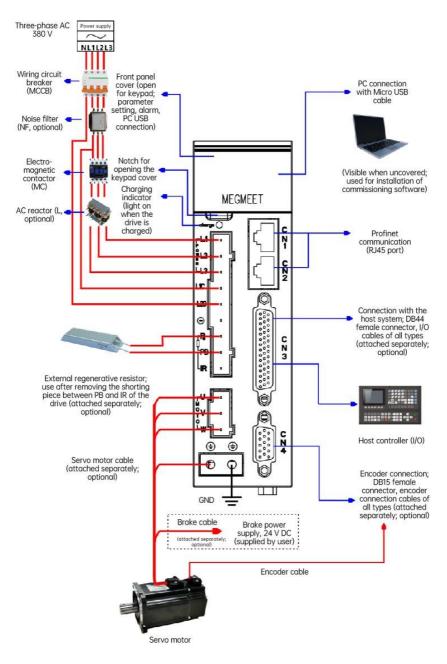


Figure 3-5 380 V three-phase servo system wiring

The 220 V single-phase system wiring method is applicable only for FS5R5AX and other 220 V models with a lower power class; the 220 V three-phase system wiring method is applicable only for FS5R5AX and other 220 V models with a higher power class.

During system wiring, pay attention to the followings:

- Make sure the power supply specifications and wiring of L1, L2, L3, L1C, and L2C are correct to avoid damage to the drive and to minimize the risks of danger;
- Make sure the motor output U, V, W phase sequence is correct during wiring; otherwise, it may cause abnormal motor rotation;
- When using an external braking resistor, it is required to remove the shorting piece between PB and IR, and install the resistor between P and PB; if an internal braking resistor is used, directly short-circuit PB and IR;
- To protect the drive system and prevent cross-device electric shock, please use a circuit breaker or fuse at the power supply input side. The recommended specifications of the circuit breaker and fuse are shown in Table 3-3;
- The drive does not have a built-in grounding protection circuit; please use a leakage circuit breaker dedicated for both overload and short circuit protection, or a leakage circuit breaker dedicated for grounding protection;
- It is strictly forbidden to directly use the electromagnetic contactor for the operation and shutdown of the motor. The motor is a large-inductance device, and the instantaneous high voltage generated may break down the contactor and other components;
- To ensure reliable operation of the system and reduce interference to the power grid system, it is recommended to add a filter at the input side.

### 3.3 Recommended specifications for circuit breakers and fuses

Drive model	Circuit breaker	Fuse
M6-FS1R6AX	4 A	10 A
M6-FS2R8AX	10 A	15 A
M6-FS5R5AX	16 A / 6 A	20 A / 10 A
M6-FS7R6BX	10 A	20 A
M6-FS7R6AX	10 A	25 A
M6-FS012AX	16 A	35 A

Table 3-2 Recommended specifications for circuit breakers and fuses

Drive model	Circuit breaker	Fuse
M6-FT3R5AX	4 A	15 A
M6-FT5R4AX	6 A	20 A
M6-FT8R4AX	10 A	20 A
M6-FT012AX	16 A	35 A
M6-FT017AX	20 A	50 A
M6-FT021AX	25 A	70 A
M6-FT026AX	32 A	100 A

# 3.4 Specifications of braking resistors

The specifications of braking resistors are shown in the table below.

Servo drive model		Built-in braking resistor specification		Min. allowable resistance of	Max. braking energy absorbed
M6-[][][][][]	[]X	Resistance ( <b>Ω</b> )	Capacity (W)	external braking resistor (Ω)	by capacitor (J)
	FS1R6AX	_	_	45	11
Single-phase 220 V	FS2R8AX	—	—	45	22
Single-phase or three-phase 220 V	FS5R5AX	50	50	45	31
	FS7R6BX	50	50	45	31
Three-phase 220 V	FS7R6AX	25	80	20	47
	FS012AX	25	80	20	64
	FT3R5AX	50	80	45	26
	FT5R4AX	50	80	45	53
Three-phase 380 V	FT8R4AX	50	80	35	53
	FT012AX	50	80	35	106
	FT017AX	_	—	25	106

Servo drive model M6-[][][][][]X		Built-in braking resistor specification		Min. allowable resistance of	Max. braking energy absorbed	
		Resistance (Ω)	Capacity (W)	external braking resistor (Ω)	by capacitor (J)	
	FT021AX	_	_	25	128	
	FT026AX	_	_	25	128	

- 1. The drive operates with PB and IR short-circuited by default; the internal braking resistor is applied under the circumstances.
- 2. In case the internal braking resistor can not deliver adequate capacity, please disconnect PB and IR, and install an external braking resistor between PB and P.
- 3. For external braking resistors, please contact us for technical support.
- 4. The symbol "—" in the table above indicates that there is no built-in braking resistor for the corresponding model.

# Chapter 4 Wiring of Servo System

This chapter provides the wiring instructions for the servo drive and the related precautions.



- Do not open the drive cover until the power supply of the drive has been completely cut off for at least 10 minutes.
- Even if the power supply is cut off, high voltage may remain inside the servo drive. To prevent electric shock, do not touch the power terminals. After discharging is completed, the CHARGE indicator will turn off. Make sure that the wiring and inspection be conducted only when the CHARGE indicator is off.
- Only the well-trained and authorized personnel are allowed to perform the internal wiring of the servo drive.
- Check the wiring carefully when connecting the emergency stop or safety circuit.
- Check the voltage class of the servo drive before powering on; otherwise, personal injury, death, or equipment damage may occur.



- Check carefully whether the rated input voltage of the servo drive is consistent with the AC power voltage before powering on.
- The servo drive has passed the dielectric withstand test before leaving the factory. Do not conduct this test again.
- Do not connect AC power supply to the U, V, or W phase.
- The diameter of the copper core used in the grounding cables shall be larger than 3.5 mm, and the grounding resistance shall be less than 10 Ω.
- There is leakage current inside the servo drive and the value of the leakage current depends on the operating conditions. To ensure safety, the drive and the motor must be grounded and a Residual Current Detector (i.e. RCD) is required. The type-B RCD is recommended. The permissible value of the leakage current is 300 mA.
- To provide the over-current protection for the input side and facilitate the power-off maintenance, the servo drive shall be connected to the AC power supply through an air switch or a fuse.

# 4.1 Servo drive main circuit connection

### 4.1.1 Main circuit specifications

The names and functions of the servo drive main circuit terminals are as shown in Table 4-1, and the cable specifications are shown in Table 4-2.

Terminal name	Terminal symbol	Drive model M6FxxxxX	Terminal function	
	L1, L2	FS1R6AX, FS2R8AX	Main circuit single-phase 220 V power supply input	
Main circuit power	ain circuit power	FS5R5AX, FS7R6BX, FS7R6AX, FS012AX	Main circuit three-phase 220 V power supply input	
supply input terminals	L1, L2, L3	FT3R5AX, FT5R4AX, FT8R4AX, FT012AX, FT017AX, FT021AX, FT026AX	Main circuit three-phase 380 V power supply input	
Control circuit input terminal	L1C, L2C	Control power supply input, single-phase AC 220 V input		
DC bus terminals	P, 🖸	Servo DC bus termin	al, used for multi-device common-bus connection	
		FS1R6AX, FS2R8AX, FT017AX, FT021AX, FT026AX	In case the braking resistor can not deliver adequate capacity, please install an external braking resistor between PB and P. Please refer to the recommendations for specifications of the external braking resistor.	
Braking resistor connection terminals	P, PB, IR	FS5R5AX, FS7R6BX, FS7R6AX, FS012AX, FT3R5AX, FT5R4AX, FT8R4AX, FT012AX	Terminals PB and IR are short-circuited by default, and the built-in braking resistor is applied under the circumstances; In case the braking resistor can not deliver adequate capacity, please disconnect PB and IR, and install an external braking resistor between P and PB. Please refer to the recommendations for specifications of the external braking resistor.	
Servo motor connection terminals	U, V, W	Used for connection with the servo motor		

Table 4-1 Terminal names and functions of the M6-F series servo drive main circuit

Terminal name	Terminal symbol	Drive model M6FxxxxX	Terminal function
Grounding terminals (Two)	I PE	For connection with the power supply grounding terminal and the serv motor grounding terminal for grounding	

For models with the built-in braking resistor, terminals PB and IR are short-circuited by default.

### 4.1.2 Main circuit cable dimensions

Recommended main circuit cable dimensions for servo drives are shown in the table below.

Table 1 2Decommonded main	airouit and	a anadificationa fa	r M/ E parian driven
Table 4-2Recommended main	CITCUIL CODI	e specifications to	I IVIO-E Series arives

	rive model 5-F[][][][][]X	Power supply input L1, L2, L3	Control power supply input L1C, L2C	Power output U, V, W	Grounding PE	Braking resistor PB, P
	FS1R6AX	20AWG	20AWG	20AWG	20AWG	20AWG
		(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )
	FS2R8AX	20AWG	20AWG	20AWG	20AWG	20AWG
SIZE A	TOZINOAN	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )
SIZE A	FS5R5AX	18AWG	20AWG	18AWG	18AWG	18AWG
	FSORDAX	(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
	FS7R6BX	18AWG	20AWG	18AWG	18AWG	18AWG
		(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
	FS7R6AX	18AWG	20AWG	18AWG	18AWG	18AWG
		(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
	50010434	18AWG	20AWG	18AWG	18AWG	18AWG
	FS012AX	(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
SIZE B	SIZE B FT3R5AX	18AWG	20AWG	18AWG	18AWG	18AWG
		(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
		18AWG	20AWG	18AWG	18AWG	18AWG
	FT5R4AX	(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
	FT8R4AX	18AWG	18AWG	18AWG	18AWG	18AWG

	rive model 6-F[][][][][]X	Power supply input L1, L2, L3	Control power supply input L1C, L2C	Power output U, V, W	Grounding PE	Braking resistor PB, P
		(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
	FTO10AV	18AWG	20AWG	18AWG	18AWG	18AWG
	FT012AX	(0.75 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )	(0.75 mm <sup>2</sup> )
	FT017AV	14AWG	20AWG	14AWG	14AWG	14AWG
	FT017AX	(1.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(1.5 mm <sup>2</sup> )	(1.5 mm²)	(1.5 mm²)
0175 0	FTOOLAN	12AWG	20AWG	12AWG	12AWG	12AWG
SIZE C	FT021AX	(2.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(2.5 mm <sup>2</sup> )	(2.5 mm <sup>2</sup> )	(2.5 mm <sup>2</sup> )
	FTOOLON	12AWG	20AWG	12AWG	12AWG	12AWG
	FT026AX	(2.5 mm <sup>2</sup> )	(0.5 mm <sup>2</sup> )	(2.5 mm <sup>2</sup> )	(2.5 mm <sup>2</sup> )	(2.5 mm <sup>2</sup> )

4.2 Servo motor encoder signal connection (CN4)

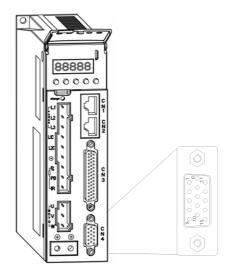


Figure 4-1 Servo motor encoder signal connection diagram

The motor encoder interface of the M6-F series servo drive supports three types of encoders, namely the 23-bit multi-turn absolute encoder, the incremental encoder, and the sin/cos encoder. The interfaces for the three types are integrated in a single DB15 port, and the interface signal definition is explained as shown in Table 4-3, Table 4-4, Table 4-5, and Table 4-6.

Connection port: CN4, DB15 three-row female connector				
Pin	Signal name	Signal description		
3	SD+	Encoder communication signal (+)		
8	SD-	Encoder communication signal (-)		
14	GND	Power supply grounding		
15	5 V	Power supply +5 V		
Enclosure	PE	Shield layer		

Table 4-3 Multi-turn absolute encoder interface definition

Table 4-4	Line-saving	incremental	encoder	interface	definition
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Connect	Connection port: CN4, DB15 three-row female connector			
Pin	Signal name	Signal description		
1	A+	Incremental differential A+ signal		
2	B+	Incremental differential B+ signal		
3	Z+	Incremental differential Z+ signal		
6	A-	Incremental differential A- signal		
7	B-	Incremental differential B- signal		
8	Z-	Incremental differential Z- signal		
14	GND	Power supply grounding		
15	5 V	Power supply +5 V		
Enclosure	PE	Shield layer		

Table 4-5 Full-line incremental encoder interface definition

Connection port: CN4, DB15 three-row female connector				
Pin	Signal name	Signal description		
1	A+	Incremental differential A+ signal		
2	B+	Incremental differential B+ signal		

Connect	Connection port: CN4, DB15 three-row female connector				
Pin	Signal name	Signal description			
3	Z+	Incremental differential Z+ signal			
4	U+	Phase differential U+ signal			
5	V+	Phase differential V+ signal			
6	A-	Incremental differential A- signal			
7	B-	Incremental differential B- signal			
8	Z-	Incremental differential Z- signal			
9	U-	Phase differential U- signal			
10	V-	Phase differential V- signal			
11	W+	Phase differential W+ signal			
12	W-	Phase differential W- signal			
14	GND	Power supply grounding			
15	5 V	Power supply +5 V			
Enclosure	PE	Shield layer			

Table 4-6 Sin/Cos encoder interface definition

Cor	Connection port: CN4, DB15 female connector						
Pin	Signal name	Signal description					
4	COS+	Sin/Cos COS+ signal					
5	SIN+	Sin/Cos SIN+ signal					
9	COS-	Sin/Cos COS- signal					
10	SIN-	Sin/Cos SIN- signal					
11	REF+	Sin/Cos zero position + signal					
12	REF-	Sin/Cos zero position - signal					
14	GND	Power supply grounding					
15	5 V	Power supply +5 V					
Enclosure	PE	Shield layer					

# 4.3 Control signal interface definition

Control signal includes the digital input and output signals. The connection mode is DB44. There is a DB44 female connector at the drive end.

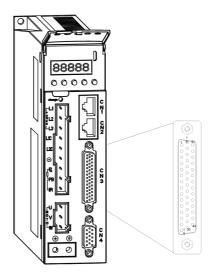


Figure 4-2 Control signal terminal definition diagram

Control signal definitions are explained in the table below.

Pin	Signal name	Pin	Signal name	Pin	Signal name
1	-	16	-	31	-
2	DO1+	17	DO1-	32	-
3	DO2+	18	D02-	33	DI1
4	DO3+	19	DO3-	34	DI2
5	-	20	-	35	DI3
6	-	21	-	36	DI4
7	-	22	-	37	-
8	-	23	DICOM	38	-
9	-	24	-	39	-

Pin	Signal name	Pin	Signal name	Pin	Signal name
10	-	25	-	40	-
11	-	26	-	41	-
12	-	27	-	42	-
13	-	28	-	43	-
14	-	29	-	44	-
15	-	30	-		

### 4.3.1 DI/DO signal

The DI and DO signals are described in the table below.

Signal	name	Default function	Pin	Default function
	DI1	DI1 /SON		Servo enable
	DI2	/ARST	34	Fault reset
	DI3	/SPD1	35	Multi-segment running reference 1
	DI4	/SPD2	36	Multi-segment running reference 2
	DICOM	DICOM DI common terminal	23	DI common terminal (Connected to power supply or ground of power supply)
General	DO1+	/SRDY	2	Sonyo roady
	D01-	JSKUT	17	Servo ready
	D02+		3	Fourth autout
	D02-	/ALM	18	Fault output
	DO3+		4	Drake output
	D03-	/BRK	19	Brake output

Table 4-8 DI and DO signals

### 4.3.1.1 Digital input circuit

M6-F series servo has four DI terminals in total. The DI common terminal can be connected to power supply or ground, and supports dry contact input, NPN input, and PNP input.

M6-F series servo does not provide 24 power supply to the outside, and the connection of DI uses external power supply.

The following example is based on DI1, and the same method applies to the interface circuits of DI1 to DI4.

### (1) Dry contact mode

The dry contact wiring method is shown in Figure 4-3.

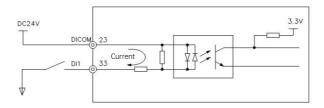


Figure 4-3 DI terminal dry contact connection mode

### (2) NPN (Sinking) mode

The external controller adopts the NPN common emitter output. The wiring method is shown in Figure 4-4.

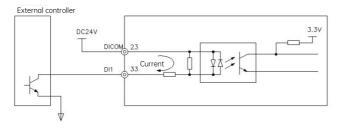


Figure 4-4 DI terminal NPN connection mode

### (3) PNP (Sourcing) mode

The external controller adopts the PNP common emitter output. The wiring method is shown in Figure 4-5.

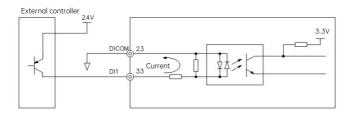


Figure 4-5 DI terminal PNP connection mode

Do not mix NPN and PNP modes on the DI terminals of the same drive.

### 4.3.1.2 Digital output circuit

The DO terminal adopts double-ended output and multiple output modes. It is required to use external power supply since no internal power supply is offered. The following example is based on DO1, and the same method applies to the interface circuits of DO1, DO2, and DO3.

### (1) The host device is relay input

When the external device adopts relay input, the wiring method is shown in Figure 4-6.

### Warning:

The inductive load (Such as relay) shall be anti-parallel with the fly-wheel diode!

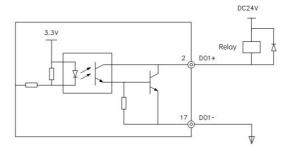


Figure 4-6 Wiring mode for connection between DO terminal and relay

### (2) Sink (NPN) output

When the controller adopts sink input, the wiring method is shown in Figure 4-7.

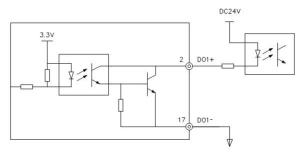


Figure 4-7 DO terminal sink (NPN) output wiring mode

### (3) Source (PNP) output

When the controller adopts source input, the wiring method is shown in Figure 4-8.

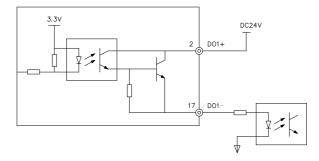


Figure 4-8 DO terminal source (PNP) output wiring mode

### 4.4 Communication interface wiring

M6-F series servo supports PROFINET communication. The communication ports are CN1 and CN2.

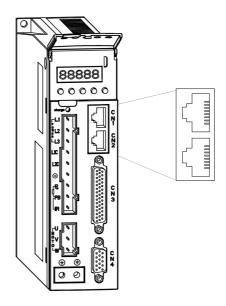




Table 4-9	Communication	interface	signal	definition
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Pin	Definition	Description				
1	TX+	Data transmit +				
2	TX-	Data transmit -				
3	RX+	Data receive +				
6	RX-	Data receive -				
Enclosure	PE	Shield				
4/5/7/8	Undefined					

# Chapter 5 Operation Panel

# 5.1 Interface introduction

M6-F series servo drive offers an operation panel that consists of five LED digital tubes and 5 keys for operational status display and parameter setting.

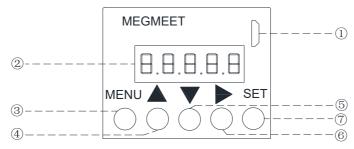


Figure 5-1 Appearance of the panel interface

Panel key functions are described in the table below.

### Table 5-1 Panel key function

Кеу	Key name	Function
MENU	Menu/Exit key	When the interface is in the operational status display mode or monitoring parameter menu mode, this key serves as the switchover between the operational status display and the parameter setting level 1 menu, or between the monitoring parameter menu and the parameter setting level 1 menu. When the interface is in the parameter setting level 2 menu, this key serves as the return key to the upper-level menu.
•	Switch/Shift/Page key	When the interface is in the operational status display mode, this key serves as the switchover between the operational status display and the monitoring parameter menu. When the interface is in the parameter setting mode, this key serves to shift to the next blinking digit on the left.
		When the parameter value is greater than 5 digits and unmodifiable, this key serves to scroll the parameter value display.
	Increase key	When the interface is in the monitoring parameter menu mode, this key serves to select the specific monitoring parameter. When the interface is in the parameter setting mode, this key serves to

Кеу	Key name	Function				
		increase the value of the blinking digit (Hold the key for faster increase).				
•	Decrease key	When the interface is in the monitoring parameter menu mode, this key serves to select the specific monitoring parameter. When the interface is in the parameter setting mode, this key serves to decrease the value of the blinking digit (Hold the key for faster decrease).				
SET	Enter/Confirm/Reset key	When the interface is in the parameter setting mode, this key serves to enter the lower-level menu, or to confirm the setting of the parameter value and return to the upper-level menu. When the interface is in the fault status display mode, this key serves to reset the fault.				

# 5.2 Operational status display

M6-F series servo drive offers display of the following operational status.

Table 5-2 Servo drive function status and display

Graphics in LED display Symbol		Status description			
- SE	"rst"	State of initialization upon powering on, indicating the system is in the state of start or reset.			
nrd	"nrd"	Indicating the start or reset is completed and that the servo is not ready.			
rdy"		Indicating the servo system is in the normal state through self-inspection and ready for the command from the host device.			
	"run"	State of servo running			
ErXXX	"Er.xxx"	State of servo error			
ALXXX	"ALxxx"	State of servo alarm			

# 5.3 Operational status display & parameter setting flowchart

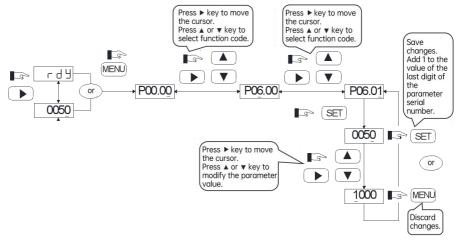


Figure 5-2 Flowchart of operational status display and parameter setting

- When the servo drive initialization upon powering on is completed, the panel enters the operational status display mode by default. If the system is determined to be normal by self-inspection, the LED will display "rdy".
- 2. When the interface is in the operational status display mode, press ► key to switch between the operational status display mode and the monitoring parameter menu mode.
- 3. When the interface is in the monitoring parameter menu mode, press ▼/▲ key to select the monitoring parameter.
- 4. When the interface is in the operational status display mode or monitoring parameter menu mode, press MENU key to switch between the present mode and the parameter setting level 1 menu.
- 5. When the interface is in the parameter setting level 1 menu, press ► key to move the cursor to the parameter group or the parameter serial number.
- 6. When the interface is in the parameter setting level 1 menu, press ▼/▲ key to select the parameter group and the parameter serial number required.
- 7. When the interface is in the parameter setting level 1 menu, press SET key to enter the parameter setting level 2 menu and display the present value of the selected parameter. If the value is currently open for modification, the last digit will blink.
- When the interface is in the parameter setting level 2 menu, press ► key to select the digit requiring modification, and press ▼/▲ key to increase or decrease the value.
- 9. When the value is modified, press SET key to save the changes and return to the upper-level menu, or press MENU key to discard changes and return to the upper-level menu.

# 5.4 Parameter value display

### 1. Display of parameter values of 5 digits and below

The parameter value which ranges from -9999 to 99999 can be displayed/edited on the same page.

### 2. Display of parameter values above 5 digits

When the parameter value is beyond the range from -9999 to 99999, it is required to turn the page for value display and editing. This system supports value display up to three pages. The following figure illustrates the page display logic. For example, the parameter value -21474836.48 can be displayed in three pages, with the value divided into [-21], [4748], and [36.48] on each page, as shown in the figure below.

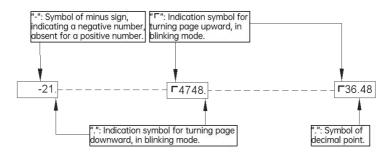


Figure 5-3 Page display logic for parameter values

If the parameter value is currently open for modification, press > key to shift and select the digit requiring modification. If modification of values is not available, the > key serves only for display page turning.

# Chapter 6 Instruction on Commissioning

# 6.1 Inspection before operation

Disconnect the servo motor from its load, and remove the coupling and its related components from the connected shaft of the servo motor. Check whether the servo motor operates normally without load. To prevent potential risks, load the servo motor again only when the no-load operation is determined to be normal.

Before operation, check and make sure:

- (1) There is no obvious sign of damage on the exterior of the servo drive;
- (2) The wiring terminals have been insulated;
- (3) There are no conductive foreign objects, such as screws or metal pieces, or combustible objects inside the servo drive, and there are no conductive foreign objects around the wiring terminals;
- (4) The servo drive and external braking resistor are not placed on combustible objects;
- (5) The wiring is completed fully and correctly:
  - Power cables, auxiliary power cables, and grounding cables of the servo drive are properly wired;
  - All control signal cables are properly and reliably wired;
  - Limit switches and protection signals are properly connected;
- (6) The servo drive enable switch is in OFF state;
- (7) The power circuit is cut off, and the emergency stop circuit is ON;
- (8) And that the external voltage reference of the servo drive is correct.

Power on the servo drive when no operation command is sent by the controller.

Check and make sure:

- (1) The servo motor works properly without vibration or excessive noise.
- (2) All parameters are correctly set. Unexpected actions may occur due to different mechanical characteristics. Please do not set the parameters to extreme values
- (3) The bus voltage indicator and the digital display work normally.

## 6.2 Start and trial run

After the wiring is completed, perform jog commissioning to check whether the servo motor can operate normally and whether there is abnormal vibration or noise when rotating. Jog commissioning can be conducted via the panel or two external DI terminals, and the rotation speed is set by P06.05.

### a. Jog commissioning via panel

Select P02.00 on the panel for control mode selection and set the function code to 0. Select P06.05 to set the jog running rotation speed. Afterward, select P06.06 and press SET key to display the present speed. Choose forward/reverse jog running via the ▼/▲ key. Press SET/MENU key to exit the jog running mode.

#### b. Jog commissioning via DI terminal

Configure two external DI terminals and set them to FunIN.17 and FunIN.18 functions respectively. After setting the jog running speed via P06.05, choose forward/reverse jog running through adjusting the DI terminal state.

# 6.3 Electronic gear

With the electronic gear function enabled, the movement amount of the workpiece corresponding to a single command pulse can be designated to an arbitrary value, and there is no need to consider the mechanical reduction ratio or the encoder pulses during system control.

#### 1) Procedure of electronic gear ratio setting

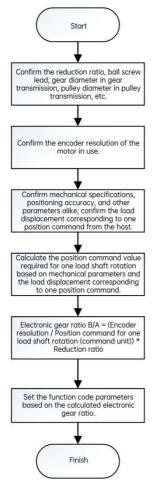


Figure 6-1 Procedure of electronic gear ratio setting

The parameter function of the electronic gear ratio is illustrated as below:

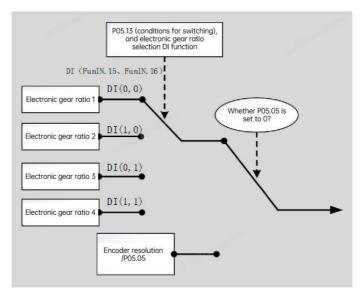


Figure 6-2 Electronic gear ratio function diagram

When P05.05 is set to a non-0 value, the electronic gear ratio formula is

$$\frac{B}{A} = \frac{\text{Electronic gear ratio}}{P05.05}$$

The electronic gear ratio 1 to 4 are invalid under such circumstances.

### 2) Related function codes

### a. Electronic gear ratio parameter value setting:

Function code	Name	Range	Min. unit	Default	Effective time	Property	Function
P05.05	Command pulses per motor revolution	0 to 8388608 P/r	1 P/r	10000	Immediate	At stop	It is used to set the number of position commands for one motor revolution.
P05.08	Electronic gear numerator	1 to 1073741824	1	8388608	Immediate	At stop	It is used to set the numerator of the electronic gear ratio.
P05.09	Electronic gear denominator 1	1 to 1073741824	1	10000	Immediate	At stop	It is used to set the denominator of the first electronic gear ratio.

Function code	Name	Range	Min. unit	Default	Effective time	Property	Function
P05.10	Electronic gear denominator 2	1 to 1073741824	1	10000	Immediate	At stop	It is used to set the denominator of the second electronic gear ratio.
P05.11	Electronic gear denominator 3	1 to 1073741824	1	10000	Immediate	At stop	It is used to set the denominator of the third electronic gear ratio.
P05.12	Electronic gear denominator 4	1 to 1073741824	1	10000	Immediate	At stop	It is used to set the denominator of the fourth electronic gear ratio.

1. The range of the electronic gear ratio is

$$0.001 < \frac{B}{A} < 30000.$$

Otherwise, a fault Er.061 (Electronic gear ratio setting error) will occur.

2. For serial absolute encoders, the resolution =  $2^n$ , of which n refers to the encoder bits. The standard absolute encoder bits of the M6-F series is 23, which means the encoder resolution is calculated as  $2^{23}$ =8388608. For incremental encoders, the resolution = Number of encoder lines \* 4. For example, the resolution of a 2500-line incremental encoder is calculated as 2500\*4=10000.

### b. Electronic gear ratio switchover setting

When P05.05 is set to 0, the electronic gear ratio switchover function is enabled. The switchover among the four electronic gear ratios shall be determined by the mechanical operation conditions, and it is required to set the switching conditions for the electronic gear ratio. There shall be only one electronic gear ratio effective at any time.

### **Related function codes**

Function code	Name	Range	Min. unit	Default	Effective time	Property	Function
P05.13	gear ratio switchover	0: Switchover after 3 ms delay when the position command is 0 1: Real-time switchover	1	0	Immediate	At stop	It is used to set the switching conditions for the electronic gear ratio.

At the same time, set the two DI terminals of the servo drive to functions 15 and 16 (FunIN.15 and

FunIN.16), and determine the active logic of the DI terminals. Refer to the table below for electronic gear ratio selection. When no DI is set to FunIN.15 or FunIN.16, FunIN.15 and FunIN.16 are disabled by default.

P05.05	P05.13	3 DI level of FunIN15 DI level of FunIN16		Electronic gear ratio B/A
	0 or 1	Inactive	Inactive	P05.08/P05.09
		Active	Inactive	P05.08/P05.10
0		Inactive	Active	P05.08/P05.11
		Active	Active	P05.08/P05.12
1 to 8388608			Encoder resolution / P05.05	

### 3) Calculation method of the electronic gear ratio

When the machine reduction ratio between the motor shaft and the load side is m/n (When the motor rotates for m circles, the load shaft rotates for n circles), the setting value of the electronic gear ratio can be obtained by the following formula:

Electronic gear ratio  $\frac{B}{A} = \frac{\text{Encoder resolution}}{\text{Movement amount (command unit) per load revolution}} \times \frac{m}{n}$ 

#### a. Confirm the mechanical parameters and the servo motor encoder resolution

Confirm the mechanical parameters, including the reduction ratio, ball screw lead, pulley transmission ratio, etc., and confirm the servo motor encoder resolution.

### b. Confirm the positioning precision (i.e. pulse equivalent)

Pulse equivalent refers to the minimum movement unit of the load corresponding to a single pulse command signal. Pulse equivalent can be represented by forms of 0.001 mm, 0.1°, or 0.01 inch, which means when a pulse is input, a load movement in distance or angle corresponding to the pulse equivalent will be implemented.

For example, when the pulse equivalent is set to 0.001 mm, if the input command pulse reaches 50000, the load movement amount will be (50000 \* 0.001 mm) = 50 mm.

### c. Calculate the number of position commands required for one load shaft rotation

Calculate the position command count required for one rotation of the load shaft using the mechanical parameters and the pulse equivalent.

For example, if the ball screw pitch sits at 5 mm, and the pulse equivalent sits at 0.001 mm, the number of position commands for the load displacement (Command bits) of one shaft rotation = 5 mm / 0.001 mm = 5000.

#### d. Calculate the electronic gear ratio

When the reduction ratio between the motor shaft and the load shaft is represented by m/n (i.e. the load shaft rotates for n circles when the motor shaft rotates for m circles), the formula is

 $Electronic gear ratio = \frac{P05.08}{P05.09} = \frac{Encoder resolution}{Movement amount (command unit) per load shaft revolution} \times \frac{m}{n}$ 

4) Example of electronic gear ratio setting is shown below.

	Content	Mechanical unit				
Step		Ball screw Disc		Belt pulley		
		Load shaft P:Screw pitch P:Screw pitch P:Screw pitch P:Screw pitch P:Screw pitch	Load shaft One revolution = $\frac{560^{\circ}}{Command unit}$	Lood shoft $D$ D D D D D D D D D D D D D D D D D D D		
1	Mechanical structure	Screw lead: 5 mm Reduction ratio: 1/1	Angle for one rotation: 360° Reduction ratio: 1/100	Pulley diameter: 100mm (Pulley circumference: 314mm) Reduction ratio: 1/50		
2	Encoder resolution	8388608 (23-bit)	8388608 (23-bit)	8388608 (23-bit)		
3	Load displacement corresponding to one command unit	0.001 mm	0.01°	0.005 mm		
4	Number of position commands for one load rotation	5 mm / 0.001 mm = 5000	360°/0.01° = 36000	314 mm / 0.005 mm = 62800 mm		
5	Electronic gear ratio	$\frac{B}{A} = \frac{8388608}{5000} \times \frac{1}{1} =$	$\frac{B}{A} = \frac{8388608}{36000} \times \frac{100}{1} =$	$\frac{B}{A} = \frac{8388608}{62800} \times \frac{50}{1} =$		
6	Parameter	P05.08=8388608 P05.09 =5000	P05.08=838860800 P05.09 =36000	P05.08=419430400 P05.09=62800		

## 6.4 Brake setting

### 6.4.1 Wiring diagram of servo motor brake

The brake signal connection does not involve polarity. User shall prepare a 24 V power supply. The standard wiring of the brake signal BK and the brake power supply is illustrated below.

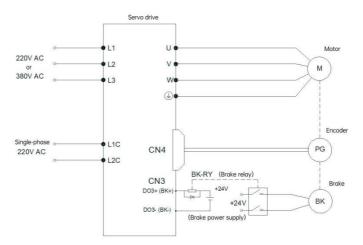


Figure 6-3 Brake wiring diagram

It is not recommended for the brake to share its power supply with other electrical units. Such measures are intended to prevent brake malfunctions caused by voltage/current drop resulted from the operation of other electrical units.

### 6.4.2 Time sequence of brake

For servo motors with brake, it is required to set one DO terminal of the servo drive to function 18 (Brake output signal), and determine the active logic of the DO terminal.

Based on the present state of the servo drive, the working time sequence of the brake unit offers two modes: "normal state" brake time sequence, and "fault state" brake time sequence of the servo drive.

There are two scenarios for the brake time sequence in normal state: static motor scenario, and rotating motor scenario.

- a. Static motor: actual motor rotating speed less than P02.12;
- b. Rotating motor: actual motor rotating speed higher than P02.12.

### 6.4.3 Brake time sequence for static motor

When the servo enable is switched from ON to OFF, if the present rotating speed of the motor is lower than P02.12, the drive will act in static motor time sequence.

#### Note:

• Do not input speed/position/torque command during the period defined by P02.10 when the brake

output is switched from OFF to ON; otherwise, a command loss or operation error may occur;

• When the servo is working with perpendicular shafts, the gravity of the mechanical part in motion or any external force may cause slight movement of the mechanical unit. When the servo motor is in the static state, if the servo enable is switched to OFF, the brake output will be switched to OFF immediately. However, within the time defined by P02.11, the motor will remain powered to prevent the mechanical part movement caused by gravity or external forces.

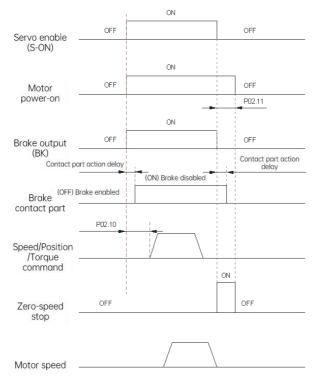


Figure 6-4 Brake time sequence for static motor

As shown in Figure 6-4, the brake function in static motor state is described below:

- a. When the servo enable is ON, the brake output will be switched to ON, and the motor will enter the power-on state at the same time;
- b. For the delay time of the brake contact part action, refer to the related motor specifications;
- c. The time interval from the brake output being switched to ON to the command input shall be greater than the length defined by P02.10;
- d. In the static servo motor state (The motor speed is less than the set value of P02.12), when the servo enable is switched to OFF, the brake output will be switched to OFF at the same time; P02.11 enables the setting of delay from the brake output being switched to OFF to the motor's entry into the non-powered state.

Parameter	Name	Range	Default	Effective time	Property
P02.10	Delay from the brake output being switched to ON to the command input	20 to 500 ms	250	Immediate	During running
P02.11	Delay from the brake output being switched to OFF to the motor's entry into the non-powered state	1 to 1000 ms	150	Immediate	During running

### 6.4.4 Brake time sequence for rotating motor

When the servo motor is in the rotating state, pay special attention to the followings:

- Do not input speed/position/torque command during the period defined by P02.10 when the brake output is switched from OFF to ON; otherwise, a command loss or operation error may occur;
- When the servo motor is rotating, if the servo enable is switched to OFF, the motor will enter the zero-speed stop state; however, the brake output will be switched to OFF only when any of the following prerequisites is met:

a. The time defined by P02.13 is not reached when the motor speed is decreased to P02.12;

b. The time defined by P02.13 is reached, but the motor speed remains higher than P02.12.

• After the brake output is switched from ON to OFF, the motor will remain powered during the following 40 ms; such measures are intended to prevent the unnecessary movement of the mechanical part caused by gravity or external forces.

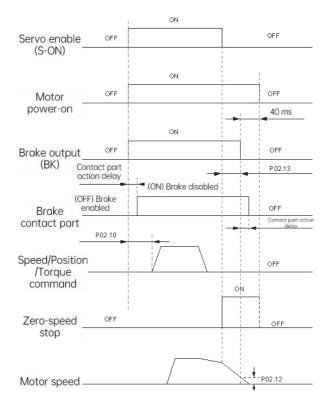


Figure 6-5 Brake time sequence for rotating motor

As shown in Figure 6-5, the brake function in rotating motor state is described below:

- a. When the servo enable is ON, the brake output will be switched to ON, and the motor will enter the power-on state at the same time;
- b. For the delay time of the brake contact part action, refer to the related motor specifications;
- c. The time interval from the brake output being switched to ON to the command input shall be greater than the length defined by P02.10;
- d. In the rotating servo motor state, when the servo enable is OFF, the brake output delay, which starts after the servo enable is switched to OFF, can be set via P02.12 and P02.13; the motor will enter the non-powered state only when the 50 ms delay is reached after the brake output is switched to OFF.

Parameter	Name	Range	Default	Effective time	Property
P02.12	Brake command output speed limit value	0 to 3000 rpm	10	Immediate	During running

Parameter	Name	Range	Default	Effective time	Property
P02.13	Delay from the servo enable being switched to OFF to the brake output being switched to OFF	1 to 30000 ms	500	Immediate	During running

### 6.4.5 Brake time sequence in fault state

Once a drive fault occurs, the motor enters the non-powered state immediately, and at the same time, the brake output will be switched from ON to OFF to disable the brake function.

# Chapter 7 PROFINET Communication

PROFINET is an automation bus standard based on industrial Ethernet technology, which was introduced by PROFIBUS International (PI). In order to provide support for different types of applications, PROFINET offers two technical solutions: PROFINET IO, which is designed for the integration of simple, distributed field devices that use Ethernet communication and the time-critical applications, and PROFINET CBA (Component Based Automation), which is aimed at the integration of distributed automation systems based on components.

PROFINET IO specifies all the data exchange methods between the I/O controller and the I/O devices. It also defines the parameterization and diagnostic methods for the I/O controller and I/O devices. It conducts rapid data exchange based on the producer/consumer communication model.

PROFINET IO provides two real-time channels: PROFINET IO RT and PROFINET IO IRT. By adopting RT real-time communication to exchange process data, its clock cycle reaches the order of 10 milliseconds, which is very suitable for the distributed I/O communication system in factory automation. While PROFINET IO adopting isochronous synchronous communication IRT can make the clock cycle reach the order of 1 millisecond, and the M6-F series cycle can reach 500 microseconds, meeting the requirements of motion control.

### 7.1 PROFIdrive

PROFIdrive is a standard profile of PROFINET IO for drive technology applications, and is now widely used in the fields of production and process automation. The PROFIdrive profile enables users to run automation applications with PROFIBUS DP and PROFINET IO conveniently and quickly without any modification.

The PROFIdrive defines six application classes (AC):

AC1: Standard drive;

AC2: Standard drive with a distributed technology controller;

AC3: Single-axis positioning drive with local motion control;

AC4: Motion control with a central interpolation and speed setpoint interface;

AC5: Motion control with a central interpolation and position setpoint interface;

AC6: Motion control for clocked processes, or distributed synchronism.

# 7.2 Overview of telegrams

The M6-F series supports application classes AC1, AC3, and AC4, and the supported communication telegrams include 1, 3, 5, 7, 9, 102, 105, 111, and the Additional Telegram 750.

Tologram	Max. number of PZDs (O	Max. number of PZDs (One PZD = One word)		
Telegram	Receive word	Send word	P17.01	
Standard Telegram 1	2	2	1	
Standard Telegram 3	5	9	3	
Standard Telegram 5	9	9	5/10005 (DSC)	
Standard Telegram 7	2	2	7	
Standard Telegram 9	10	5	9	
Siemens telegram 102	6	10	102	
Siemens telegram 105	10	10	105/10105 (DSC)	
Siemens telegram 111	12	12	111	
Siemens telegram 750	3	1	P17.02=750	

#### Telegrams used for speed mode

Telegram	1		3	3	Į	5	10	2	10	5
Application class	1		1/	4	4	1	1/-	4	4	
PZD1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1
PZD2	NSOLL_A	NIST_A								
PZD3			NSOLL_B	NIST_B	NSOLL_B	NIST_B	NSOLL_B	NIST_B	NSOLL_B	NIST_B
PZD4			STW2	ZSW2	STW2	ZSW2	STW2	ZSW2	STW2	ZSW2
PZD5			G1_STW	G1_ZSW	G1_STW	G1_ZSW	MOMRED	MELDW	MOMRED	MELDW
PZD6	Receive	Receive Send	XERR	01.1/1071	G1_STW	G1_ZSW	G1_STW	G1_ZSW		
PZD7	word	word		G1_XIST1	AEKK	G1_XIST1			VEDD	
PZD8					KDC			G1_XIST1	XERR	G1_XIST1
PZD9				G1_XIST2	КРС	G1_XIST2			KDC	
PZD10								G1_XIST2	KPC	G1_XIST2

#### Telegrams used for position mode

Telegram	7		9		111		
Application class	3		3		3		
PZD1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	
PZD2	SATZANW	AKTSATZ	SATZANW	AKTSATZ	POS_STW1	POS_ZSW1	
PZD3			STW2	ZSW2	POS_STW2	POS_ZSW2	
PZD4				VICT A	STW2	ZSW2	
PZD5			MDI_TARPOS XIST_A		OVERRIDE	MELDW	
PZD6							
PZD7	Receive word	Send word	MDI_VELOCITY		MDI_TARPOS	XIST_A	
PZD8	Receive word	Sena word	MDI_ACC				
PZD9			MDI_DEC		MDI_VELOCITY	NIST_B	
PZD10			MDI_MOD		MDI_ACC	FAULT_CODE	
PZD11					MDI_DEC	WARN_CODE	
PZD12					USER	USER	

The Additional Telegram 750 functions as torque control when used with the speed mode telegrams.

Telegram	750	
Application class	-	
PZD1	M_ADDI	M_ACT
PZD2	M_LIMIT_POS	
PZD3	M_LIMIT_NEG	

### 7.3 I/O data overview

I/O	Description	Receive word/Send word	Data Type	Scaling
STW1	Control word 1	Receive word	U16	-
STW2	Control word 2	Receive word	U16	-

I/O	Description	Receive word/Send word	Data Type	Scaling
ZSW1	Status word 1	Send word	U16	-
ZSW2	Status word 2	Send word	U16	-
NSOLL_A	Speed setpoint A (16-bit)	Receive word	116	4000 hex == P01.06
NSOLL_B	Speed setpoint B (32-bit)	Receive word	132	40000000 hex == P01.06
NIST_A	Speed actual value A (16-bit)	Send word	116	4000 hex == P01.06
NIST_B	Speed actual value B (32-bit)	Send word	132	40000000 hex == P01.06
G1_STW	Encoder 1 control word	Receive word	U16	-
G1_ZSW	Encoder 1 status word	Send word	U16	-
G1_XIST1	Encoder 1 actual position 1	Send word	U32	-
G1_XIST2	Encoder 1 actual position 2	Send word	U32	-
MOMRED	Torque reduction	Receive word	116	4000 hex == P01.04
MELDW	Message word	Send word	U16	-
КРС	Position gain	Receive word	132	-
XERR	Following error	Receive word	132	-
SATZANW	Position segment selection	Receive word	U16	-
AKTSATZ	Selected position segment	Send word	U16	-
MDI_TARPOS	MDI target position	Receive word	132	1 hex == 1 LU
MDI_VELOCITY	MDI target velocity	Receive word	132	1 hex == 1000 LU/min
MDI_ACC	MDI acceleration override	Receive word	116	4000 hex == 100%
MDI_DEC	MDI deceleration override	Receive word	116	4000 hex == 100%
XIST_A	Position actual value A	Send word	132	1 hex == 1 LU
OVERRIDE	Position velocity override	Receive word	116	4000 hex == 100%
MDI_MODE	Position MDI mode	Receive word	U16	-
FAULT_CODE	Fault code	Send word	U16	-

I/O	Description	Receive word/Send word	Data Type	Scaling
WARN_CODE	Alarm code	Send word	U16	-
M_ADD1	Additional torque	Receive word	116	4000 hex == P01.04
M_LIMIT_POS	Positive torque limit	Receive word	116	4000 hex == P01.04
M_LIMIT_NGE	Negative torque limit	Receive word	116	4000 hex == P01.04
M_ACT	Actual torque	Send word	116	4000 hex == P01.04

### 7.4 Control word

# 7.4.1 STW1 control word (Telegram 1/3/5)

STW1	Description
STW1.0	1 = ON (Pulses can be enabled) 0 = OFF1 (Braking with ramp-function generator)
STW1.1	1 = No OFF2 (Allow enable) 0 = OFF2 (Immediate pulse suppression, and switching on inhibited)
STW1.2	<ul> <li>1 = No OFF3 (Allow enable)</li> <li>0 = OFF3 (Braking with ramp-function generator, pulse suppression, and switching on inhibited)</li> </ul>
STW1.3	1 = Enable operation (Pulses can be enabled) 0 = Inhibit operation (Suppress pulses)
STW1.4	1 = Operating conditions (The ramp-function generator can be enabled) 0 = Inhibit ramp-function generator (Set the ramp-function generator output to 0)
STW1.5	1 = Continue ramp-function generator 0 = Freeze ramp-function generator (Freeze ramp-function generator output)
STW1.6	1 = Enable setpoint 0 = Inhibit setpoint (Set the ramp-function generator input to 0)
STW1.7	† = ON. Acknowledge faults

STW1	Description
STW1.8	1 = JOG 1 signal source
STW1.9	1 = JOG 2 signal source
STW1.10	1 = Control via PLC
STW1.11	Reserved
STW1.12	Reserved
STW1.13	Reserved
STW1.14	Reserved
STW1.15	Reserved

## 7.4.2 STW1 control word (Telegram 102/105)

STW1	Description
STW1.0	t = ON (Pulses can be enabled)
	0 = OFF1 (Braking with ramp-function generator)
STW1.1	1 = No OFF2 (Allow enable)
	0 = OFF2 (Immediate pulse suppression, and switching on inhibited)
	1 = No OFF3 (Allow enable)
STW1.2	0 = OFF3 (Braking with ramp-function generator, pulse suppression, and switching on inhibited)
STW1.3	1 = Enable operation (Pulses can be enabled)
51 W1.5	0 = Inhibit operation (Suppress pulses)
STW1.4	1 = Operating conditions (The ramp-function generator can be enabled)
51001.4	0 = Inhibit ramp-function generator (Set the ramp-function generator output to 0)
STW1.5	1 = Continue ramp-function generator
	0 = Freeze ramp-function generator (Freeze ramp-function generator output)
STW1.6	1 = Enable setpoint
	0 = Inhibit setpoint (Set the ramp-function generator input to 0)

STW1	Description
STW1.7	† = ON. Acknowledge faults
STW1.8	1 = JOG 1 signal source
STW1.9	1 = JOG 2 signal source
STW1.10	1 = Control via PLC
STW1.11	Reserved
STW1.12	Reserved
STW1.13	Reserved
STW1.14	1 = Closed-loop torque control active 0 = Closed-loop speed control active
STW1.15	Reserved

## 7.4.3 STW1 control word (Telegram 7/9/111)

STW1	Description
STW1.0	<ul> <li>t = ON (Pulses can be enabled)</li> <li>0 = OFF1 (Braking with ramp-function generator, pulse suppression, and ready for switching on)</li> </ul>
STW1.1	1 = No OFF2 (Allow enable) 0 = OFF2 (Immediate pulse suppression, and switching on inhibited)
STW1.2	<ul> <li>1 = No OFF3 (Allow enable)</li> <li>0 = OFF3 (Braking with ramp-function generator, pulse suppression, and switching on inhibited)</li> </ul>
STW1.3	1 = Enable operation (Pulses can be enabled) 0 = Inhibit operation (Suppress pulses)
STW1.4	1 = Do not reject traversing task 0 = Reject traversing task (Ramp decrease at max. deceleration value)
STW1.5	1 = No intermediate stop 0 = Intermediate stop
STW1.6	† = Activate traversing task
STW1.7	† = Acknowledge faults

STW1	Description
STW1.8	1 = JOG 1 signal source
STW1.9	1 = JOG 2 signal source
STW1.10	1 = Control via PLC
STW1.11	1 = Start to return to reference point
	0 = Stop returning to reference point
STW1.12	Reserved
STW1.13	Reserved
STW1.14	Reserved
STW1.15	Reserved

## 7.4.4 STW2 control word (Telegram 3/5/102/105)

STW2	Description
STW2.0	Reserved
STW2.1	Reserved
STW2.2	Reserved
STW2.3	Reserved
STW2.4	Reserved
STW2.5	Reserved
STW2.6	Reserved
STW2.7	Reserved
STW2.8	1= Traverse to fixed endstop
STW2.9	Reserved
STW2.10	Reserved
STW2.11	Reserved
STW2.12	Main life sign, bit 0
STW2.13	Main life sign, bit 1
STW2.14	Main life sign, bit 2
STW2.15	Main life sign, bit 3

## 7.4.5 STW2 control word (Telegram 9/111)

STW2	Description
STW2.0	Reserved
STW2.1	Reserved
STW2.2	Reserved
STW2.3	Reserved
STW2.4	Reserved
STW2.5	Reserved
STW2.6	Reserved
STW2.7	Reserved
STW2.8	1 = Traverse to fixed endstop
STW2.9	Reserved
STW2.10	Reserved
STW2.11	Reserved
STW2.12	Reserved
STW2.13	Reserved
STW2.14	Reserved
STW2.15	Reserved

### 7.4.6 SATZANW control word

SATZANW	Description
SATZANW.0	1 = Traversing block selection, bit 0
SATZANW.1	1 = Traversing block selection, bit 1
SATZANW.2	1 = Traversing block selection, bit 2
SATZANW.3	1 = Traversing block selection, bit 3
SATZANW.4	1 = Traversing block selection, bit 4

SATZANW	Description
SATZANW.5	1 = Traversing block selection, bit 5
SATZANW.6	Reserved
SATZANW.7	Reserved
SATZANW.8	Reserved
SATZANW.9	Reserved
SATZANW.10	Reserved
SATZANW.11	Reserved
SATZANW.12	Reserved
SATZANW.13	Reserved
SATZANW.14	Reserved
SATZANW.15	1 = Activate MDI 0 = Do not activate MDI

# 7.4.7 MDI\_MOD control word

MDI_MOD	Description
MDI_MOD.0	1 = Absolute positioning selected 0 = Relative positioning selected
MDI_MOD.1	Reserved
MDI_MOD.2	Reserved
MDI_MOD.3	Reserved
MDI_MOD.4	Reserved
MDI_MOD.5	Reserved
MDI_MOD.6	Reserved
MDI_MOD.7	Reserved
MDI_MOD.8	Reserved
MDI_MOD.9	Reserved

MDI_MOD	Description
MDI_MOD.10	Reserved
MDI_MOD.11	Reserved
MDI_MOD.12	Reserved
MDI_MOD.13	Reserved
MDI_MOD.14	Reserved
MDI_MOD.15	Reserved

# 7.4.8 POS\_STW1 control word

POS_STW1	Description
POS_STW1.0	1 = Traversing block selection, bit 0
POS_STW1.1	1 = Traversing block selection, bit 1
POS_STW1.2	1 = Traversing block selection, bit 2
POS_STW1.3	1 = Traversing block selection, bit 3
POS_STW1.4	Reserved
POS_STW1.5	Reserved
POS_STW1.6	Reserved
POS_STW1.7	Reserved
POS_STW1.8	1 = Absolute positioning selected
F05_51W1.0	0 = Relative positioning selected
POS_STW1.9	Reserved
POS_STW1.10	Reserved
POS_STW1.11	Reserved
POS_STW1.12	1 = Continuous transmission
POS_STW1.13	Reserved
POS_STW1.14	Reserved
POS_STW1.15	1 = Activate MDI
PU3_31W1.15	0 = Do not activate MDI

# 7.4.9 POS\_STW2 control word

POS_STW2	Description
POS_STW2.0	Reserved
POS_STW2.1	1 = Set a reference point 0 = Do not set reference points
POS_STW2.2	1 = Reference cam active 0 = Reference cam not activated
POS_STW2.3	Reserved
POS_STW2.4	Reserved
POS_STW2.5	1 = Jog, incremental active (Not supported) 0 = Jog, velocity active
POS_STW2.6	Reserved
POS_STW2.7	Reserved
POS_STW2.8	Reserved
POS_STW2.9	Reserved
POS_STW2.10	Reserved
POS_STW2.11	Reserved
POS_STW2.12	Reserved
POS_STW2.13	Reserved
POS_STW2.14	Reserved
POS_STW2.15	Reserved

# 7.5 Status word

### 7.5.1 ZSW1 status word (1/3/5)

ZSW1	Description
ZSW1.0	1 = Ready for servo on
	0 = Not ready for servo on
ZSW1.1	1 = Ready for operation
	0 = Not ready for operation
ZSW1.2	1 = Enable operation
20001.2	0 = Inhibit operation
ZSW1.3	1 = Fault present
23001.3	0 = No fault
ZSW1.4	1 = Coast to stop inactive
23001.4	0 = Coast to stop active
ZSW1.5	1 = Quick stop inactive
23001.5	0 = Quick stop active
ZSW1.6	1 = Switching on inhibition active
23001.0	0 = Switching on inhibition inactive
ZSW1.7	Reserved
ZSW1.8	1 = Speed error within tolerance P17.15
23001.0	0 = Speed error exceeding tolerance P17.15
ZSW1.9	1 = Existing control request
2311.7	0 = No control request
ZSW1.10	1 = Reaching or exceeding the reference speed P17.17
23001.10	0 = Not reaching or exceeding the reference speed P17.17
ZSW1.11	Reserved
ZSW1.12	Reserved
ZSW1.13	Reserved
ZSW1.14	Reserved

ZSW1	Description
ZSW1.15	Reserved

### 7.5.2 ZSW1 status word (102/105)

ZSW1	Description
ZSW1.0	1 = Ready for servo on
	0 = Not ready for servo on
ZSW1.1	1 = Ready for operation
	0 = Not ready for operation
ZSW1.2	1 = Enable operation
	0 = Inhibit operation
ZSW1.3	1 = Fault present
	0 = No fault
ZSW1.4	1 = Coast to stop inactive
	0 = Coast to stop active
ZSW1.5	1 = Quick stop inactive
23001.3	0 = Quick stop active
ZSW1.6	1 = Switching on inhibition active
20001.0	0 = Switching on inhibition inactive
ZSW1.7	Reserved
ZSW1.8	1 = Speed error within tolerance
23001.0	0 = Speed error exceeding tolerance
ZSW1.9	1 = Existing control request
20001.7	0 = No control request
ZSW1.10	1 = Reaching or exceeding the reference speed
20001.10	0 = Not reaching or exceeding the reference speed
ZSW1.11	Reserved
ZSW1.12	Reserved

ZSW1	Description
ZSW1.13	Reserved
ZSW1.14	1 = Closed-loop torque control active 0 = Closed-loop torque control inactive
ZSW1.15	Reserved

### 7.5.3 ZSW1 status word (7/9/111)

ZSW1	Description
ZSW1.0	1 = Ready for servo on
	0 = Not ready for servo on
ZSW1.1	1 = Ready for operation
25001.1	0 = Not ready for operation
ZSW1.2	1 = Enable operation
23001.2	0 = Inhibit operation
ZSW1.3	1 = Fault present
25001.5	0 = No fault
ZSW1.4	1 = Coast to stop inactive
25001.4	0 = Coast to stop active
ZSW1.5	1 = Quick stop inactive
23001.5	0 = Quick stop active
ZSW1.6	1 = Switching on inhibition active
23001.0	0 = Switching on inhibition inactive
ZSW1.7	Reserved
ZSW1.8	1 = Position error within tolerance
23001.0	0 = Position error exceeding tolerance
ZSW1.9	1 = Existing control request
23001.7	0 = No control request
ZSW1.10	1 = Target position reached
23001.10	0 = Target position not reached
ZSW1.11	1 = A reference point is set
۵۷۷۱.۱۱	0 = No reference point is set
ZSW1.12	† = Traversing block acknowledge activated

ZSW1	Description
ZSW1.13	Reserved
ZSW1.14	Reserved
ZSW1.15	Reserved

### 7.5.4 ZSW2 status word

ZSW2	Description
ZSW2.0	Reserved
ZSW2.1	Reserved
ZSW2.2	Reserved
ZSW2.3	Reserved
ZSW2.4	Reserved
ZSW2.5	Reserved
ZSW2.6	Reserved
ZSW2.7	Reserved
ZSW2.8	1 = Traverse to fixed endstop
ZSW2.9	Reserved
ZSW2.10	1 = Enable pulses
ZSW2.11	Reserved
ZSW2.12	Reserved
ZSW2.13	Reserved
ZSW2.14	Reserved
ZSW2.15	Reserved

### 7.5.5 MELDW status word

MELDW	Description
MELDW.0	Reserved
MELDW.1	Reserved
MELDW.2	Reserved
MELDW.3	Reserved
MELDW.4	Reserved
MELDW.5	Reserved
MELDW.6	Reserved
MELDW.7	Reserved
MELDW.8	1 = Speed error within tolerance
	0 = Speed error exceeding tolerance
MELDW.9	Reserved
MELDW.10	Reserved
MELDW.11	1 = Drive enabled
	0 = Drive disabled
MELDW.12	1 = Drive ready
	0 = Drive not ready
MELDW.13	Reserved
MELDW.14	Reserved
MELDW.15	Reserved

# 7.5.6 POS\_ZSW1 status word

POS_ZSW1	Description
POS_ZSW1.0	1 = Traversing block activated, bit 0
POS_ZSW1.1	1 = Traversing block activated, bit 1

POS_ZSW1	Description
POS_ZSW1.2	1 = Traversing block activated, bit 2
POS_ZSW1.3	1 = Traversing block activated, bit 3
POS_ZSW1.4	Reserved
POS_ZSW1.5	Reserved
POS_ZSW1.6	Reserved
POS_ZSW1.7	Reserved
POS_ZSW1.8	Reserved
POS_ZSW1.9	Reserved
POS_ZSW1.10	1 = JOG activated 0 = JOG not activated
POS_ZSW1.11	1 = Reference point return activated 0 = Reference point return not activated
POS_ZSW1.12	Reserved
POS_ZSW1.13	Reserved
POS_ZSW1.14	Reserved
POS_ZSW1.15	1 = MDI activated 0 = MDI not activated

# 7.5.7 POS\_ZSW2 status word

POS_ZSW2	Description
POS_ZSW2.0	Reserved
POS_ZSW2.1	Reserved
POS_ZSW2.2	Reserved
POS_ZSW2.3	Reserved
POS_ZSW2.4	Reserved
POS_ZSW2.5	Reserved

POS_ZSW2	Description
POS_ZSW2.6	Reserved
POS_ZSW2.7	Reserved
POS_ZSW2.8	Reserved
POS_ZSW2.9	Reserved
POS_ZSW2.10	Reserved
POS_ZSW2.11	Reserved
POS_ZSW2.12	1 = Fixed stop point reached
103_23772.12	0 = Fixed stop point not reached
POS_ZSW2.13	1 = Have reached the clamping torque at the fixed stop point
103_23772.13	0 = Have not reached the clamping torque at the fixed stop point
DOS 75W/2 14	1 = Fixed stop point activated
POS_ZSW2.14	0 = Fixed stop point not activated
POS_ZSW2.15	Reserved

# 7.6 PN communication parameters

- Set P02.00 to 10 when choosing the PN mode;
- Telegram configuration (P17.01, and P17.02) shall be consistent with the configuration of the PLC program;
- The device name and IP configured by PRONETA shall be consistent with the configuration of the PLC program;
- When DSC function is enabled, the value of P17.01 = 10000 + Telegram number

Parameter number	Name	Range	Min. unit	Default	Effective time	Property	Description
		P17	: PN p	paramete	rs		
P17.00	PN software version	0 to 9999	1	100	-	At display	
P17.01	Telegram number selection	0 to 65535	1	3	Power-on again	At stop	Telegram 1, 3, 5, 7, 9, 102, 105, 111, 10005 (DSC active), and

Parameter number	Name	Range	Min. unit	Default	Effective time	Property	Description
							10105 (DSC active) are supported.
P17.02	Additional Telegram	0 to 65535	1	0	Power-on again	At stop	Additional Telegram 750 is supported.
P17.03	IP address	0 to 0xFFFFFFFF	1	0	Power-on again	At stop	FF.FF.FF.FF
P17.04	Subnet mask	0 to 0xFFFFFFFF	1	0	Power-on again	At stop	FF.FF.FF.FF
P17.05	Default gateway	0 to 0xFFFFFFFF	1	0	Power-on again	At stop	FF.FF.FF.FF
P17.06	Heartbeat threshold	0 to 65535	1	5	Power-on again	At stop	
P17.07	Communication timeout	0 to 65535	1	1	Power-on again	At stop	Step size 0.1 (Unit: s)
P17.08	User receive word	0 to 65535	1	0	Power-on again	At stop	0: Function 1: Torque limit Others: PNU number used by Telegram 111
P17.09	User send word	0 to 65535	1	0	Power-on again	At stop	0: No function 1: Actual torque 2: Actual current 3: DI status Others: PNU number used by Telegram 111
P17.10	Homing offset type	0 to 65535	1	0	Power-on again	At stop	
P17.11	Homing offset	-2147483648 to 2147483647	1	0	Power-on again	At stop	
P17.12	Fixed endstop clamping torque	0 to 655.35	1	0	Immediate	At stop	

Parameter number	Name	Range	Min. unit	Default	Effective time	Property	Description
P17.13	Maximum following error of the fixed endstop	0 to 2147483647	1	10000	Immediate	At stop	
P17.14	Fixed endstop monitoring window	0 to 2147483647	1	100	Immediate	At stop	
P17.15	Speed tolerance	0.1 to 6000.0	1	0	Immediate	At stop	
P17.16	Time tolerance	0 to 65535	1	0	Immediate	At stop	
P17.17	Speed reference	0 to 6000.0	1	0	Immediate	At stop	
P17.18	MAC address	0 to 0xFFFFFF	1	0	-	At display	
P17.19	MAC address	0 to 0xFFFFFF	1	0	-	At display	
P17.20	Reserved	0 to 65535	1	0	Immediate	At stop	
P17.21	Reserved	0 to 65535	1	0	Immediate	At stop	
P17.22	Reserved	0 to 65535	1	0	Immediate	At stop	
P17.23	Reserved	0 to 65535	1	0	Immediate	At stop	
P17.24	Reserved	0 to 65535	1	0	Immediate	At stop	

# 7.7 RT mode configuration

Using the PROFINET RT network, the M6-F series can communicate with the Siemens PLC models (Including S7-1500, S7-1200, and S7-200 Smart) for speed/position/torque control.

### 7.7.1 S7-1500 configuration

There are two methods to realize position control when the M6-F series is communicating with S7-1500 PLC via PROFINET.

The PLC configures the position axis technology objects, the M6-F model uses Siemens Telegram 105 or Standard Telegram 3, and the control is achieved via PLC Open standard function blocks such as MC\_Power or MC\_MoveAbsolute. This control method is identified as the centralized control mode (The position control is calculated in PLC).

The PLC uses FB284 (SINA\_POS) function block, the M6-F model uses Siemens Telegram 111, and the position control function (Including relative positioning, absolute positioning, etc.) is achieved. This control method is identified as the distributed control mode (The position control is calculated in the drive).

This section details the configuration of the S7-1500 PLC using the TIA Portal V17 engineering tool and the communication connection with the M6-F model via the PROFINET interface.

### 7.7.1.1 Create new project

Create a new project, set the name and path, and click "Create."

#### Add PLC device

Double click "Add new device" in the "Project tree" in the left side of the project view, and find the matching PLC device based on the PLC model. In this example, the PLC model is "6ES7 511-1AK02-0AB0". Select successively the following items: "Controllers"  $\rightarrow$  "SIMATICS7-1500"  $\rightarrow$  "CPU"  $\rightarrow$  "CPU 1511-1 PN"  $\rightarrow$  "6ES7 511-1AK0-0AB0"  $\rightarrow$  "V2.8".

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#### 7.7.1.2 Install GSDML file

Install the GSDML file and add the M6-F device. Select successively the following items: "Options"  $\rightarrow$  "Manage general station description files"  $\rightarrow$  "Source path". Select the path of the GSDML file, and click "Install". It would be displayed as "Installed".

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Add M6-F device.

Switch to "Network view" from "Device view". In the "Hardware catalog" to the right, select successively "Other field devices"→"PROFINET IO"→"Drives"→"MEGMEET DRIVE"→"M6"→"MEGMEET DRIVE M6-F V1.0".

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Click the "Unassigned" of the M6-F servo drive, select the I/O controller "PLC\_1.PROFINET interface\_1", and integrate the PLC and the M6-F into the same PROFINET subnet.

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#### 7.7.1.3 IP address and device name configuration

To set the PLC IP address, click the PLC\_1 network port, and select successively the following items: "Properties"  $\rightarrow$  "Ethernet addresses"  $\rightarrow$  "Set IP address in the project".

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To set the M6-F IP address and device name, click the red frame on M6-F as shown in the image below, and select successively the following items: "Properties"  $\rightarrow$  "Ethernet addresses"  $\rightarrow$  "Set IP address in the project"  $\rightarrow$  "PROFINET device name".

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<ul> <li>Watch and force tables</li> </ul>	M6-F [MEGMEET DRIVE						MEGNEETDRI.	8. U
Online backups	M6-F [MEGMEET DRIVE	M6-F V1.0]	S Properties	💁 Info 🔒 Dia	gnostics		SERVOTRONIX	
Traces	General IO tags	System constants Texts					SIEMENS AG	
OPC UA communication	- General						Incoders Sateway	
Device proxy data	Catalog information						sateway	>
22 Program info	· PROFINET interface [X1]	Internet protocol version 4	(10.4)			× Informa		2
FLC supervisions & elerms	General	internet protocor reristoria	(a + 4)			✓ Informa	tion	
E PLC alarm text lists	Ethernet addresses		Set IP address in the pri	piect		Device:	-	
<ul> <li>Local modules</li> </ul>	Identification & Mainte	ance			<b>1</b> U	1	-	
Distributed NO	<ul> <li>Advanced options</li> </ul>		IP address: 19		1		•	
Engrouped devices	Interface options		Subnet mask: 25	55 . 255 . 255 . 0				
Security settings	Media redundancy	1	Synchronize router setti	ings with IO controller				
Details view	Isochronous mode	- F	Use router				MEGMEET DRIVE M	óf
	Real time settings						V1.0	
	Port 1 [X1 P1 8]					Article no.:	MEGMEET DRIVE M	-
	Port 2 [X1 P2 R]		O If address is set directly	yat the device		Anote no.:	MEGMEET DAIVE NO	PT.
Name	Identification & Maintenar	ce				Version:	(GSDML-V2.33-ME	
	Shared Device	PROFINET						
						Description:		
			Generate PROFINET dev	rice name automatical	y .		GMEET DRIVE M6-F V1.	
		FROFINET device name	m64			non-cyclic co	T4O interface (RT, IRT a immunications, clock	no
		Converted en m				121		5

### 7.7.1.4 Add standard Telegram 3

The following image shows the method of adding the Standard Telegram 3 into the device view. The same method applies to the other standard telegrams and the Siemens telegrams.

	II ← M6-F-STD3 →	Ungrouped devices > M6-F [M	REGMEET DRIVE M6-F V1.0]		_ # <b>=</b> X	Hardware catalog	
Devices			🛃 To	pology view 🛛 📩 Network	view 📑 Device view	Options	
8	1 2 de Mor (Neg	MEETDRIVE M6-F V 💌 🔡 🜌 🖌	1 1 0 t 1	Device overview			
			~	W Module	Rack Slot	✓ Catalog	-
M6FSTD3	~			▼ MG	HACK SIDE	dearch>	-
Add new device				• MHD	0 0		
devices & networks				Port 1	0 0	Filter Profile: Alb	
- RLC_1 [CRU 1511-1 PN]		20		Port 2	0 0	Head module	
Device configuration				• Drive 1	0 0	- Module	
S Online & diagnostics				Parameter Access P	pint 0 11	Drive	
Software units	-	_		Standard Telepram		- Submodules	
Program blocks				Sterivero relevant	0 13	SIEMENS Telegram 14	
Technology objects			PINORM		2	SIEMENS Telegram 10	
External source files						SIEMENS Telegram 1	
PLC tags					_	Standard Telegram 1	
PLC data types						Standard Telegram 3	
Watch and force tables						Standard Telegram 5	
Coline backups						Standard Telegram 7	
🕨 📴 Traces						Standard Telegram 9	
OPC UA communication						Supplementary Teleg	jram 75.
Device proxy data							
Program info						< 1	
FLC supervisions & elerms						✓ Information	
1 PLC alarm text lists	4 11	> 100%	· •	<		Device:	
Local modules	× -	× 1.00%			,	DP-NO	
<ul> <li>Distributed 10</li> </ul>			3	Properties Info	Diagnostics Diagnostics	DP-NC	JROM
Generation of the second	General						
Security settings	~					1	
Details view						Standard Tele	mero
	No 'p	roperties' available.				3, PZD-5/9	
	No 'er	operties' can be shown at the mome	nt. There is either no object sele-	rted or the selected object does o	of have any	Article no.:	
		yable properties.					
Name						Version:	
						Description:	
						Standard Telegram 3: Closed- speed control plus 1 position	loop
						encoder, PZD length 5/9 words	4

#### 7.7.1.5 Save, compile, and download

Click "Save the project" to save the whole project settings after its configuration is finished. Right click "PLC\_1[CPU 1511-1PN]" in the "Project tree" on the left, and select "Compile" in the pop-up list, then choose "Hardware and software (only changes)" to compile the whole project.

Siemens - D:W6F_STOW6-F-STD3W6-F-STD3	
oject Edit View Insert Online Options Tools Window Help ? 🎦 Save project 🛃 🗶 🗐 🖕 👟 🖒 ± (≈± 🖏 🔃 🖬 🔛 💋 Goonline 🖉 Gootline 🏭 🕼	Totally Integrated Automation
Project tree E	
Devices	Topology view A Network view IN Device view Options
19 19 19 19 19 19 19 19 19 19 19 19 19 1	
N6-F5TD3	Y Module Rack Sice Catalog
Add new device	II • MS-P 0 0 Gearch> MA
Devices 8 networks	▼ PN4D 0 0   Fiter Profile:
	Fort I U U U Head module
PLC 1 PPU M Change device & Print preview	Port 2 0 0 Via Module
B Online & d Open Export Clix data	• Drive_1 0 1 Drive
> Software u Open in new editor → Export module labeling strips	Parameter Access Point 0 11 - I Submodules
Properties Alt+Enter	Standard Telegram 3, PZD-5/9 0 1.2
Technolog X Cut Ctrl+X	0 13 SEMENS Telegram 105, PZD-1
External so In Copy     Ctrl+C	0 2 Sit MENS Telegram 111, P2D-1
PLC tags Roste Ctrl+V	Standard Telegram 1, P2D-2/2
Contraction of the second	Standard Telegram 3, PZD-5/9
Watch and Rename P2	Standard Telegram 5, PZD-9/9
	Standard Telegram 7, FZD-2/2
	Standard Telegram 9, PZD-10/
Go to network view     Go OPC UA co	Supplementary Telegram 75
Bevice pro     Compile     Mardware and software (only changes)	
Download to device Hardware (only changes)	< II
Backup from online device Hardware (rebuild all)	× Information
Go online Ctrl+K Software (only changes)	V Device:
Go offine Ctrl+M Software (rebuild all)	Device:
	Properties Linfo Diagnostics
b Receive all de	The second secon
Snapshot of the actual values	
Load snapshots as actual values	
Details view Details view Details start values as actual values	Standard Telegram 3, PZD-519
Module Copy snapshots to start values >	3. P2D-5M
Start simulation Ctrl+Shift+X pment. There is e	either no object selected or the selected object does not have any Article no.:
Name Compare	
Name de Compare P Device configuration - de Search in project Ctrl-F	Version: w
Device configuration W Scolar Project	Description:
Online & diagnostic X Crossveferences F11	Standard Teleoram 3: Closed-loop
Software units 🔢 Call structure	speed control plus 1 position
Program blocks	encoder, P2D length 5/9 words
Technology objects 💐 Update program	< 11 >
Portal view Shint Ctrl+P	🔝 😪 The project M6-F-STD3 was saved succ

Click "Download to device", and click "Start search" in the pop-up window. It will starts scanning and locating the PLC devices in the network. Select the needed PLC device in the search result list. Download the configuration information and programs into the PLC device by successively clicking "Load" → "Finish".

oject tree 🛛 🔳	Extended download 1	nound doulene b bb	E E INCONCET DE	NE MC E	V5.01			a = ×	Hardware cata		
Devices	Extended download i	o device					^	view	Options		
1 1 1		Configured access no	des of "PLC_1"					-			
		Device	Device type	Slot	Interface type	Address	Subnet	_	1.0.1		_
1 M6455T01		FLC_1	CPU 1511-1 PN	1.01	PNIE	192.168.0.1	PNIE_1		✓ Catalog		
Add new device								0	dearch>		44
Add new device     Add new device     Add new device								0	Filter Pro	fle: Alb	•
Devices a networks     PLC_1 [CPU 1511-1 PN]								0	+ Head mod		- m (
Device configuration								0	· Module	and the	
Contine & disgnostics								1	Drive		
Software units			Type of the PGIPC into		PINE			11	- Di Submodule	24	
Somware Units     Somware Units     Som Program blocks			PGPC inte	erface:	🖬 Intel(R) Gigab	it CT Desktop Adapter	• 🖲 🖸	12		5 Telegram 102, P	704
Technology objects		Con	nection to interface/s	ubnet:	PINIE_1			13		5 Telegram 105, P	
General source files				ninaur [			- 10	2		5 Telegram 111, P	
FLC tags										d Telegram 1, PZI	
Contractings										d Telegram 3, PZI	
Watch and force tables		Select target device:				Show all compatible	devices 💌			d Telegram 5, PZI	
Contine backups		Device	Device type	Interfac	etvoe Ad	dress	Tarpet device			d Telegram 7, PZI	
Traces	-	pic 1.profinet 格口 1	\$7-1500	PINIE		2.168.0.1	-			d Telegram 9, PZI	
OPC UA communication		-	-	PINIE	Act	cess address	-		Suppler	nentary Telepram	75.
Bevice proxy data											
E Program info	20								<		
PLC supervisions & elerms									✓ Information		_
In PLC elerm text lists	Flash LED								Device:		-
Local modules								>	Device:		
Distributed I/D								<b>1</b>		DP-NOR	Δ.
Ungrouped devices							Start search				
Security settings	Online status informati	00:				Display only error n	nessages				
D	Scanning										
Details view		atible devices in the sele	cted subnet.				<u>^</u>			tandard Telegran	2
Module	Found accessible										
	Found accessible	levice plc_1 profinet 接口,	1				~		Article no.:		
Name							1.01		Version: E		I.
Device configuration						Load	Cancel		Personal L		20
Online & diagnostics						000	Sauces	- 11	Description:		
									Standard Telepre	m R. Classed lane	
Software units Program blocks	1		ing fnished (errors:	0, warning	5:3)			-	speed control pli encoder, PZD ler	is 1 position	

### 7.7.2 S7-200 SMART configuration

The M6-F series adopts the PROFINET RT and the Siemens Telegram 111 in the communication with the Siemens S7-200 SMART PLC. The configuration procedure of STEP7-Micro/WIN SMART software is as shown below.

#### 7.7.2.1 Create a project

Create a new project, and select the PLC model in use.

(m) 🗋 🖬 🖨 🔹 •			Project1 - STEP 7	7-Micro/WIN SN	MART				0 ×
File Edit View	PLC Debug Tools	Help							۲
High Speed Motion PID PWM	Test Get/Put Data PROFINE				Options		-		
	Wizards	System Block	100 C				×		
Main 4	C C C C C C C C C C C C C C C C C C C	DPU CPU ST20 (DC/DC/DC)	Version V02.05.01.00.00.01.00			der Number S7 288-15 120-0640			
	A MAIN × SER.0	58 CPO ST20 (CPO ST20 (CPOC)	1402.08.01_00.00.01.00		20.0 66	57 289-151 20-UNAU	_		÷.
Project1     What's New	Program Comments	EM 0	-						^
CPU ST40	1 Network Comment	EM 1							
Program Block     Symbol Table		EM 2							
🛞 🧰 Status Chart		EM 3 EM 4							
Data Block     System Block		EM 5	-				-		
System Block     English Block									
E Communications	2 Enter comment	Communication Sthera	et Tort						
Wizards     Tools		Digital Inputs	address data is fixed to the value	ues below and carr	not be changed b	y other means			
E O Instructions		11.0 - 11.7	IP Address 192	168 . 2 . 1	_				
E St Logic		Digital Outputs							
Bit Logic     Bit Logic     Bit Logic		Retentive Ranges	Subnet Mask 255 .	255 . 255 . 0					
Communications	3 Enter comment	C Startup	Default Gateway: 0 .	0.0.0					
Compare     Convert									
E G Countero			Station Name:						
Elizating Point Nath		Backgr	ound Time						
Integer Math     Integer Math     Interrupt	122		ct Communications Background T	lime (5 - 50%)					
Logical Operations	4 Enter comment	- 10	*						
Ge Move     Program Control	C. FOR CONTROL								
Shit/Rotate		R5485	fort						
Sting	^	R54	85 settings allow you to adjust th devices use to communicate	he communications p	perameters that	the PLC and			
Table     Topes		114		-					
PROFINET	5 Enter comment	-							
Libraries	5 Erler convert		Baud Rate: 9.6 Kbps	• •					
Call Subroutines	N								~
	<					K Cancel			>
	Symbol Table			a × [	Variable Table				0 X
	3-3-134				3 3 6				-
						Symbol	Var Type Data Type	Convert	
	Symbol Table 🔲 Status C	nart 📑 Data Block			Variable Tab	ole 📴 Cross Reference	📔 Output Window		
Project Tree	INS A Not compre	ted						1025	-0 (A)

#### 7.7.2.2 Load GSDML file

To load the GSDML files, select successively the following items: "GSDML Management"  $\rightarrow$  "Browse"  $\rightarrow$  select the path of the GSDML file  $\rightarrow$  "OK".

	4	×
File Edit View	PLC Disbug Taxis Hilp	0
New Close Save Decision	xt - 1 a garage and a g	
Operations	Transfer Print Protection LBranes GSBMs	
Main #		
Project	1 MAIN × SBR.0 FIT.0	2
What's New	Pagan Q User of User of Use	î
CPU ST20     Program Block	1 Nebuck C Introduction	
Symbol Table     Status Chart	"GGDM, management" allows you to install and delete GGDM. Hes for PROFINET.	
Data Block.		
System Block	Teperted GSIME. files	
- E Communications	Effer Come     File Name     Kutalation Date     Status     2025/03/18 14-418     DK	
Wisards     E Tools		
Gi Instructions     Favorites	K−− 1	
🛞 🥶 Bit Logic		
Clock     Communications	3 Entercom	
Compare	Little Lotter	
Convert  Counters		
III Floating-Point Math     III Integer Math		
· · · · · · · · · · · · · · · · · · ·		
End Logical Operations End Move	4 Erter com	
Program Control	fastall zer GSHL	
<ul> <li>Shit/Rotate</li> <li>Shit/Rotate</li> </ul>	D:WeiFWand提定任WeiFG20文件\ Brense Delete	
🛞 🛲 Table	ox	
G Timers     PROFINET		
Gal Libraries     Gal Subroutines	S Erter convert	
E in caracitoria		~
		3 X
	lymbol table * X (windle fable 한국·철리학습	+ X
	Adden Smithel VarTage DataTage Connert	_
	Symbol Table III Status Chart III Data Block	

7.7.2.3 Configure the IP address and device name

Click successively "Tools" and "PROFINET", and select "Controller" in "PLC Role" for PROFINET.

File Edit View PLC	Debug Tools Help		0
High Speed Motion PD PWM Tert Counter	ay Log Server Control Pa	DOC MARKAN SAAT DATA AND AND AND AND AND AND AND AND AND AN	
Main DOODING	T Carefornation MEnand		
	TE Bala	The same data to its influence INOPET including to Take "WindOTET and pursies a generated and stand in the pursies, when can be demonstrated to built Compare and Terroris."	
s	< Previous N	ent> Cercel	3 8 X

Click "NEXT" to set the IP address and device name for M6-F.

				Project1 - STEP 7-Mic	ro/WIN SMART			- a x
High Speed Motion PID &	W FLC Debug Teals		dian PID Control SMART Dri Banel Panel Configuratio Toos	ve Find PROFINET Cer on * Devices Man	tricate agement Settings	_		Ø
Average     A	RORNIC configuration Wated 7007 Having Control (PDT) 20,2000 et 20,4000 et	Ten can add Berice tabl Device Number 1 2 3 4 5 5 6 7 8 4 5 6 7 8 4	able lists all devices t devices from the device of	at we currently o	c200mot 200mot 20011 20152 2015 2015	FB0THF actors PA0900 102.08.1.0	A Normal           B Andread           B Andread <td< td=""><td></td></td<>	
	< >							

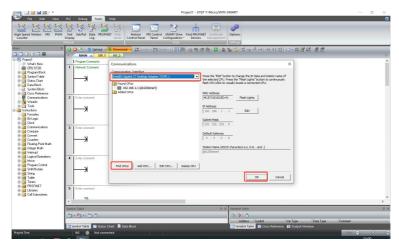
#### 7.7.2.4 Add Siemens Telegram 111

Add "Drive" in the module list, and "SIEMENS Telegram 111" in the sub-module list.

(m) 🗋 🗃 🖨 🗘 *		Pro	oject1 - STEP 7-Micro/WIN SMART			- 0 ×
File Edit Vie	ew PLC Debug Tools	Help				0
High Speed Motion PID	PWM Test Get/Put Data PROFINI Diplay Log	T Web Server Control Panel Control SMART Drive				
Main	PROFINET Configuration Wizard				×	
Constant Constant	STATE TRANS TELEPHONE STATE A STATE OF THE STATE IN CONTRACT OF THE STATE OF THE STATE OF THE STATE IN CONTRACT OF THE STATE OF THE STATE OF THE STATE IN CONTRACT OF THE STATE OF THE STATE OF THE STATE OF THE STATE IN CONTRACT OF THE STATE OF	Citiz de "dal" bottos to ad a cabilitado 1000 1000 1000 1000 100 100 100 100 100	e for this device. Benediating Performance	30:5040 Pt Dott 0:202001 0:202002 0:202000 0:202000 0:202000 0:202000 0:202000 0:2020	How Hard Control         How Hard Control           How Hard Hard Hard Hard Control         How Hard Control           How Hard Hard Hard Hard Control         How Hard Control           How Hard Hard Hard Hard Control         How Hard Hard Hard Control           How Hard Hard Hard Hard Hard Control         How Hard Hard Hard Hard Control           How Hard Hard Hard Hard Hard Hard Hard Hard	
Call Subroutines		Add Delete	4.00 V Deta Hold	3 -		v
		Upclate Time (ms)	4.00 V Deta Hold	3 💌		>
						0 X
	< >	< Previous Next >	Generate	Cancel		_
			100 million			

#### 7.7.2.5 Save, compile, and download

Select a computer network card in the communication interface list. Select the PLC and click "OK"



Download the complete project.

		Project1 - STEP 7-Micro/WIN SMART	- 0 ×
File Edit View	PLC Debug Tools Help		0
	A A A A A		
High Speed Motion PID PW1 Counter		Motion PID Control SMART Drive Find PROFINET Certificate Options Control Panel Panel Configuration Devices Management	
Counter	Witardi	Tools Settings	
Main	* 🔾 🔾 🔆 🕆 Upload - 🦺 Downlo	et - Cannet - NO Delete - NO NO - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	
	MAIN × SER.0 PIT_0		P.
Key Project1     What's New	Program Comments		^
- CPU ST20	1 Network Comment		
Program Block     Symbol Table			
🛞 🧰 Status Charl			
Data Block     System Block			
Communications	-	Download X	
Wizards	2 Enter comment	Boralead blocks to CPU	
Tool:     Instructions		Select blocks to download	
- Favorites	1		
Bit Logic     Bit Logic     Bit Logic		Click Download to begin	
E G Communications	3 Enter comment		
Compare     Convert			
Countero	<b>K</b>	Blacks Options	
B Integer Math     Integer Math		Program Block Program Block	
<ul> <li>milliterrupt</li> </ul>		Plana Block Prompt on STOP to FUN	
Generations     Generations     Generations	4 Enter comment	System Black Close dialog on success	
Program Control     Shift/Rickste	N	Click for lielo and Support     Download     Ope	
<ul> <li>Shing</li> </ul>	K →	Click for Help and Support Clove	
Intera			
PROFINET	5 Enter comment		
Generation     Call Subroutines	5 Erver convert		
Carolina Carolina			, ×
		T	
	Symbol Table	a X Variable Table	8 ×
	(2) · (2	Addwar Symbol Var Type Data Type Comment	
	Symbol Table 📑 Status Chart 📑 D		

# 7.8 IRT mode configuration

Only PLC S7-1500 supports IRT configuration. An addition of the following configuration based on the configured RT mode enables the realization of IRT communication.

 In the IRT mode, the connection in the Topology view shall be configured in strict consistency with the actual physical connection. However, in the RT mode, there is no need of connection to be made in the Topology view.

	E	evices & networks			_ # # X	Hardware catalog	
evices			🖉 Topology view	📥 Network view 📑 Der	vice view	Options	
	🔳 🖈 👻 🖶 📲 🖽	🔲 Q.1		Topology overview	< >		
			^			✓ Catalog	
M6-F-STD3	^			100	let a	Gearch>	444
Add new device		-		Y Device / port	Slot		
📥 Devices & networks	PLC_1 CPU 1511-1 PN	M6-F MEGNEET DRV CO.HORA		<ul> <li>\$7-1500/ET200MP station_1</li> </ul>		Filter Profile: NIS	۲
BLC_1 (CPU 1511-1 PN)	CPO ISTI-I PN			<ul> <li>FLC_1</li> <li>FROFINETintedace 1</li> </ul>	1	Controllers	
Device configuration		PLC.1 CNT C	TV2		1 X1	• 📴 НМ	
😼 Online & diagnostics	-	T		Fort_1	1 X1 P1	PC systems	
Software units				Port_2	1 X1 P2	Drives & starters	
Program blocks				<ul> <li>GSD device_1</li> </ul>		Network components	
Technology objects			1	▼ M6-F	0	Detecting & Monitoring	
External source files			2	* MH0	0 X1	Distributed VO	
PLC tags				Fort 1	0 X1 P1	Power supply and distr	bution
PLC data types				Port 2	0 X1 F2	Field devices	
<ul> <li>Watch and force tables</li> </ul>						Other field devices	
Online backups							
🕨 🚾 Traces							
OPC UA communication							
Device proxy data							
Program info							_
PLC supervisions & alarms						✓ Information	
PLC alarm text lists	< 1	> 100%	× •			Device:	
Local modules	×	3 100%		<	>	-	
Distributed I/O			Q Properties	🗓 Info 🚯 🗓 Diagnostics			
🔙 Ungrouped devices	General (1)	Cross-references Compile					
20 Security settings						1	
betails view	🗕 🐣 🚱 🚹 🚺 Show	vall messages 💌					
retails view							
	e Peth	Description		Go to ? Errors We	nings Time		
						Article no.:	
1000						Version:	2
						Description:	

• Configure the synchronization time in the Network view. The minimum value for M6-F is 250 microseconds. Click "Network view", then click the connecting cable in white and blue/green, and select "Highlight sync domain".

		M6-F-STD3 > Devices & r	etworks					_ # = ×	Hardware catalog		
Devices				d	Topology view	A Network vi	ew 🛙	Device view	Options		
8	= =	Network 🚼 Connections			🗍 @.±	-	N				
						1	1	Device	✓ Catalog		_
M6-F-STD3	^							<ul> <li>\$7-1500/ET20.</li> </ul>	dearth>		941 (M
Add new device								+ PLC_1			
A Devices & networks		PLC_1	M6-F	Highlight IO sys	em:			<ul> <li>GSD device 1</li> </ul>		<ab< td=""><td></td></ab<>	
- RLC 1 [OPU 1511-1 PN]		CPU 1511-1 PN	MEGMEET DRIV	PLC 1.PROFIL Highlight sync o	ET IO-System (100)			<ul> <li>Gob Bevice_1</li> <li>M6-F</li> </ul>	Controllers		
Device configuration			PLC_1	Sync-Domain				• 500-P	э 🥁 нм		
Q Online & diagnostics				- Spectroning					PC systems		
Software units	-			_ r					• Drives & starte	15	
Program blocks			PN/IE_1						• In Network comp	onents	
Technology objects							•		Detecting & M	onitoring	
Set External source files							-		Distributed NO		
PLC tags									Power supply a	and distributi	on
Co FLC data type:									Field devices		
Watch and force tables									> Coher field des	ices	
Gnline backups											
Traces											
OPC UA communication											
Gevice proxy data											
Program into											
PLC supervisions & alarms									✓ Information		
PLC alarm text lists									Device:		
Local modules		< =		> 100%			) <	11	Device:		
Distributed NO					Q Properties	1 Info 🕕 🖏	Discourse	tics 10 v			
Lingrouped devices					S rioperues	1 24 miles ( 1 20 m	viagitos	ues proces			
Security settings		General 🚯 Cross-refe	rences Comp	ile							
N	~	🖸 🚹 🕕 Show all message	1 E								
<ul> <li>Details view</li> </ul>											
		1 Perts	Description			Go to 7		Warnings Time			
		1 Feur	Description			0010	LIIUIS	mannings mine	Article po :		
Name									Version:		
									Description:		

Double click "Sync-Domain\_1", and select successively the following items: "Domain management"  $\rightarrow$  "Sync domains"  $\rightarrow$  "Sync-Domain 1"  $\rightarrow$  "Devices"  $\rightarrow$  "IO devices"  $\rightarrow$  "Synchronization role"  $\rightarrow$  "Sync master".

	E 4 M6-F-STD3 > Devices & net	5	- *	🖹 🗙 Hardware catalog 🛛 🗊 🗉
Devices		🛃 Topology view	📥 Network view 🛛 🕅 Device vie	
	🗉 📅 📢 Network 🚼 Connections 🗏	rmection 💌 😇 👯 🖀 🖽 🛄 🍳 ±	📑 N	< >
		# Sync domain:	: Sync-Domain_1 ^ W Device	✓ Catalog
1 M6-F-STD3	^		× 57-1500	tt20 (Search)
Add new device	PLC 1		> mc_1	
Devices & networks		DRIV DRIV	s GSD dev	ritter ritter (010)
• 🛄 PLC_1 (CPU 1511-1 PN)	P		• M6-P	Controllers
Device configuration			1	• 🔄 HM
😟 Online & diagnostics	-	1	-	PC systems     PC systems     Prives & starters
<ul> <li>Software units</li> </ul>	B	Domain 1		Drives & starters     Network components
<ul> <li>Program blocks</li> </ul>				Detecting & Monitoring
Technology objects				Distributed VD
<ul> <li>External source files</li> </ul>			~	Power supply and distribution
PLC tags	<	> 100% -	· · · · · · · · · · · · · · · · · · ·	Field devices
Gal PLC data types     Gal Watch and force tables	Sync-Domain_1 [Object]	Properties	1 Info 8 Diagnostics	Cher field devices
Watch and force tables     Gnline backups	General 10 tags S	m constants Texts		- Contraction
Traces		in constants   Texts		
Generation	<ul> <li>PROFINETSubnet</li> </ul>	>>> Devices		<u>^</u>
Device providata	General			
Program info	Domein management	IO system		
PLC supervisions & alarms	Sync domains     Sync-Domain 1			✓ Information
PLC alarm text lists	Devices		ync mester	
Cal Local modules	Details	FLC_1.PROFINETIO-System (100)	LC_1	Device:
Distributed I/O	b MPF domains			
Se Ungrouped devices	Overview isochronous mode			
Security settings	<ul> <li>FLC_1 PROFINETID System (</li> </ul>			
Details view	V Programme roopsimile.			4H
		IO devices		
		PROFINET device name RT class Synchronization r	role Redundancy level DFP group	Article no.:
Name		pic_1.profinet.interface_1 RT. V Sync master m6-f RT Unsynchronized		Version:

Configure the synchronization time based on the actual demands. Successively select and click the following items: "Domain management"  $\rightarrow$  "Sync domains"  $\rightarrow$  "Sync-Domain\_1"  $\rightarrow$  "Send clock".

Devices	Z Topology view & Network view I Device view Options	
B) 10	Retwork U Connection + C + Q +	-
	# Sync domain: Sync Domain_1 A V Device V Catalog	
<ul> <li>M6-F-GTD3</li> </ul>	A E CASSONETON AGAIN	644 64
Add new device		
📥 Devices & networks	PUL1 Miler m	ofie: Alb
* 📑 PLC_1 [CPU 1511-1 PN]	Constitution and Constitution and Constitution and Constitution and Constitution	5
Device configuration		
S Online & diagnostics	► PC system	
Software units	Sync Domain 1	
Program blocks	President of the second s	
Technology objects	> Detecting	
<ul> <li>External source files</li> </ul>	V Distribute	
PLC tags		pply and distribution
PLC data types	Sync-Domain_1 [Object]	
Watch and force tables	Contraction of the Contraction o	d devices
Online backups	General IO tags System constants Texts	
Traces	PROFINETSubnet     Sync.domains	
<ul> <li>OPC UA communication</li> </ul>	General	
Device proxy data	Domain management	
Program info	Sinc domains Default	
PLC supervisions & alarms	MPP domains Sync Opmain_1	
PLC alarm text lists	Overviewisochronous mode - view sync domaino- Device:	
Local modules	FLC_1.FROFINETIO-System (	
<ul> <li>Distributed I/O</li> </ul>		
Ungrouped devices		
<ul> <li>Security settings</li> </ul>	×	
<ul> <li>Details view</li> </ul>		
	>> Sync-Domain 1	
	Article no.:	
Name	Sync-Domain, 1 Version:	
	Converted name: sync domainob19998 Description:	
	Converted name: i sync domaind 19998 Description:	

 Configure the M6-F synchronization mode in the Device view. Successively click "Device view"→ "M6-F[MEGMEET DRIVE M6-F V1.0]"→"Advanced options"→"Isochronous mode", and tick the box of "Isochronous mode".

		s ► M6-F [MEGMEET DRIVE ME	5-F V1.0]	_ # # >	K Hardware catalog	
Devices			Topology view	Device view	Options	
8	M6-F MEGNEET DRIVE M6-F V	8 2 4 8 1 Q t	A Device overview		-	
	The function of the second of the				✓ Catalog	-
M6-FSTD3			Module	Rack Slot .		
Add new device	÷		• M6-F	0 0	<ul> <li>Search&gt;</li> </ul>	ini kin
Devices & networks			PNHO	0 0X1 [1	Tilter Profile: Alb	
* IN PLC 1 [CPU 1511-1 PN]	6		<ul> <li>Drive_1</li> </ul>	0 1	Head module	
Device configuration			Parameter Access Point	0 11	Module	
Q Online & diagnostics	K = > 100%	×		>	Submodules	
Software units	M6-F [MEGMEET DRIVE M6-F V1.		Properties Info D	agnostics 🛛 🗆 – 🤊		
B Program blocks	General 10 tags Syste	m constants Texts				
Technology objects	• General					
Sign External source files	General     Catalog information	<ul> <li>Isochronous mode</li> </ul>				
PLC tags	PROFINET interface [X1]	Isochronous mode for local r	1			
Eg PLC data types	General	Isochronous mode for local r	nodules			
Watch and force tables	Ethernet addresses	ſ	Isochronous mode			
Online backups	Identification & Meintenance					
🕨 🥁 Traces	Advanced options	Send clock:		ms 🗡		
OPC UA communication	Interface options	Application cycle:	2.000	ms 者		
Device proxy data	Madia radundanza	TilTo values:	Automatic minimum			
2 Program info	Isochronous mode	Time Ti (read in process				
PLC supervisions & alarms	Real time settings	values):	0.125000 ms 🗘		✓ Information	
E PLC alarm text lists	• Port 1 [X1 P1 R]	Intervals:	0.125	ms	Device:	
Local modules	Port 2 [X1 P2 R]	Time To (output process				
Distributed I/0	Identification & Maintenance	values):	0.25 ms 🗘			
Ungrouped devices	Shared Device	Intervals:	0.125	ms		
Security settings						

Successively select the following items: "Program blocks"  $\rightarrow$  "Add new block"  $\rightarrow$  "Organization block"  $\rightarrow$  "MC-Servo"  $\rightarrow$  "OK".

ject tree	🛙 🖣 MG-E-ST							X Hardware		
Devices				are Topology view	A Network vie	w 🕅 0	evice view	Options		
m	12 de 10	dd new block			100	×				
							Slat	V Catalo	0	
M6F-STD3	~	Name: MCServo				CK	0	A Search	2	
Add new device		MCSENO					0 X1			
A Devices & networks							0 AT	🗏 🗹 Filter	Profile: sAllo	
PLC_1 (CPU 1511-1 PN)			E Program cycle	Language:	LAD		11	Heat		
Device configuration			Startup 5	Number		101		Yodi 🖌 📜 Modi		
& Online & diagnostics	< =	OB	Time delay interrupt				)	📕 🕨 🧊 Subr	nodules	
Software units	M6-F	Organization	Cyclic interrupt		O Manual	C 8		-		
- 🙀 Program blocks	Ge	block	Hardware interrupt							
Add new block			Time error interrupt			-		_		
Amin [081]	✓ Ger		Diagnostic error interrupt							
Technology objects			Pull or plug of modules	Description:						
Esternal source files		-rs	E Rack or station failure	-	black MC-Serva (OB 91	1.0				
PLC tegs		Function block	Programming error	used for \$7-1500	Motion Control function	e6				
Rectage			IO access error		s, signs of life and pos	ition				
Watch and force tables			Time of day	control.	constant bus cycle tin		ms 🗡			
Online backups	- · ·		- MCinterpolator	If the Motion IO is	operated in an	·*	ms 7			
Traces			MCServo	is ochronous 10 s	stem, the bus cycle cl	ock				
GPC UA communication			MCPreServo	defines the cycle	time. You can also se properties of the OB I	the	-			
Device proxy data		Function	MCPostServo	Servo (0891).	propenses of the Ub I	w		✓ Inform	ation	
			MC-Freinterpolator	Serie (Des if.					auon	
21 Program info			Synchronous Cycle			-	ms	Device:		
PLC supervisions & alarms			Status							
PLC alarm text lists	Idea	DB	- Jodate							
Local modules	She		Profile				ms			
Distributed #0	~	Data block					105			
Details view				more						
		Additional inform	ation			_				
	-							Article no.		
		Add new and gpen			OK Cars	cel		Article no.		
Name	_							Version:		
			Dine_inscribero t in			_				
								Descriptio	n;	

Right click "MC-Servo" to enter its property setting. Navigate to the "Cycle time" in the "General" view, select "Synchronous to the bus", and click "OK".

	□ 4 M6-F-STD3 + PLC_1 [CPU 1511-1 PN] + Program blocks + MC Servo [OB91]	_ # = ×	Instructions	
	Action of the second seco		Options	Vers V1.0 V1.0 V1.0 V1.0 V1.0 V1.0 V1.0 V
Ith Program info Pr C share see lists Pr C alarm see lists Details view Name Address		ancel	SRAKEC Ident     SRAKEC Ident     EnergySuite extensions	<u>V5.5</u> V2.2 <u>V2.3</u>

Click successively the following items: "Device view"  $\rightarrow$  "M6-F[MEGMEET DRIVE M6-F V1.0]"  $\rightarrow$  "Standard Telegram 3"  $\rightarrow$  "I/O addresses". Tick the box "Isochronous mode".

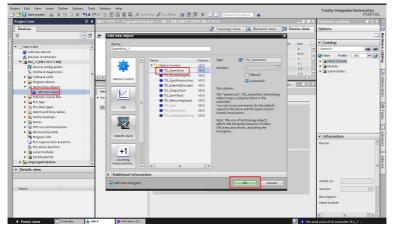
	M6-F-STD3 + Ungrouped devices + M6-F [MEGMEET DRIVE M6-F V1.0]	_ ■ ■ X Hardware catalog ■ □
Devices	Z Topology view 🚠 Network view 👔 Devi	rice view Options
T	12 # MEFINEGREETDRIVE MEFV = 1 12 K 1 1 0, 1 1 Device overview	
		Slet Catalog
1 M6-F-STD3	Modele Marc	0 A Gearcho 244 a
Add new device		
A Devices & networks	S Dive 1 0	H M Filter Profile: OND IN B
<ul> <li>PLC_1 (CPU 1511-1 PN)</li> </ul>		Head module
Device configuration		Module
😼 Online & diagnostics		13 Submodules
🕨 🚟 Software units	< 1 × 100% ×	>
Program blocks	Standard Telegram 3, PZD-5/9 [Standard Telegram 3, PZD-5/9] Q Properties 14 Info () U Diagnostics	
Technology objects		
<ul> <li>External source files</li> </ul>	General IO tags System constants Texts	
PLC tags	▼ General WO addresses	
PLC data types	Catalog infogmation I/O addresses	
<ul> <li>Watch and force tables</li> </ul>	N0 addresses Input addresses	
Gnline backups		
🕨 🚰 Traces	Start address: 0	
OPC UA communication	End address: 17	
Device proxy data	kochronous mode	
Program info		
PLC supervisions & alarms	Organization block MC-Servo	✓ Information
FLC alarm text lists	Process image: PIP OB Servo	Device:
Local modules		
Distributed I/O	Output addresses	
Ungrouped devices		
Security settings	Y Start address: 0	
Details view	End address: 9	
	₩ tachronous mode	
		Article ps :
	Organization bloc : MC-Servo	
Name	Process image: MP 08 Servo	Version: m
		Description:
		Head module

# 7.9 Axis technology object configuration

By the addition of axis technology objects, the M6-F series is enabled to use the Telegram 1, 3, 5, 102, and 105 in the configuration with the PLC, and to achieve motion control based on the PLC Open function blocks, such as MC\_Power, MC\_Reset, MC\_Velocity, and MC\_MoveRelative.

# 7.9.1 TO\_SpeedAxis

Click successively the following items: "Technology objects"  $\rightarrow$  "Add new object"  $\rightarrow$  "TO\_SpeedAxis"  $\rightarrow$  "OK".



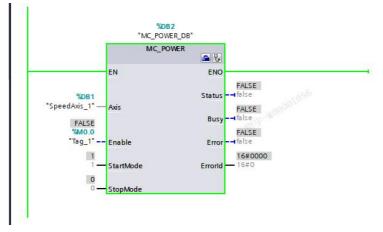
Select "M6-F" in the "Drive" view.

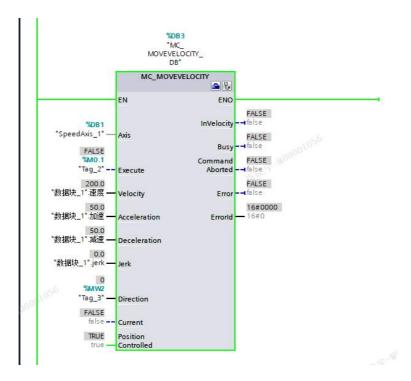
Desken	Interiors Contentions Contenti	Technology cóprct + Speeddola Dole			
MARDI     Address de la conservation     Address de la co	neters O I iterface O I hange with the drive O			Power	v
MA 400     March 200	neters O I iterface O I hange with the drive O			Foreight of the state of t	v
Add and active     Add activ	hange with the drive			Fover         Find:           Whate words only         Whate words only           Whate words only         Match case           Prind in bidder word         With words only           Use widdands         Use widdands           Use widdands         Down           Op         De	
A development     Constraints     Constant     Constraints     Constraints     Constraints     Constraint	hange with the drive			Power  Power  V V V V V V V V V V V V V V V V V V	
Construct Annualis     Construct Annuali	hange with the drive 🛛 🕄	r.c		Power  Power  Prod in Nubstructure  Prod in Nubstructure  Prod in Nubstructure  Vise wildcand Use englare egessio  Down Up	
Control (2013) The Termine Control (2013) The Termine Control (2014) T		nc L		Power         Match case           Find in substructures         Find in hidden texts:           Use widcands         Use regular expression           O Down         Up	
Conversion of segments     Conversion of segments     Conversion of segments     Conversion of segments     Conversion	arameters Q CS Q debuit values Q krystop Q e iniciantis Q e limits Q	nc t		Power         Match case           Find in substructures         Find in hidden texts:           Use widcands         Use regular expression           O Down         Up	
State         Control         Control <thcontrol< th=""> <thcontrol< th=""> <thco< td=""><td>cs Ø default values Ø ncystop Ø nic limits Ø e limits</td><td></td><td></td><td>Power         Match case           Find in substructures         Find in hidden texts:           Use widcands         Use regular expression           O Down         Up</td><td></td></thco<></thcontrol<></thcontrol<>	cs Ø default values Ø ncystop Ø nic limits Ø e limits			Power         Match case           Find in substructures         Find in hidden texts:           Use widcands         Use regular expression           O Down         Up	
P         a program blobs         Emerger           P         a program blobs         • Limits           P         A program blobs         • Limits           P         A program blobs         D put           P         Secolves         1001           P         Secolves         1001           P         Secolves         D pointers           P         Person brunch fills         Person           P         Person brunch fills         Person	default values O krystop O nic limits O e limits O	RC L	<u> </u>	Prover     Prind in substructures     Prind in bidden twes     Use widcards     Use widcards     Use widcards     Use regular expressio     Onom     Up	
▶ in Program Nacks         ► Limits           ■ Rechnology beforts         Dynamics           ■ Advance objects         Dynamics           ■ Advance objects         Transport           ■ Advance objects         Transport           ■ Advance objects         Dynamics	xystop nic limits e limits		<b>1</b>	Find in hidden texts     Use wildcands     Use regular expressio     Down     Up	
Can technology objects     Opraw     And An env object     C Scondow J (101)     Communication     H Communication     H Communication     H Communication     Source Riss     Go Comparison     Go Compariso	nic Simits	1 1		Use vegular expression Down Up	ons
Gongueson	e limits	t		Use regular expression	ons
Conduction     C	e inmetia	t		⊙ Down ○ Up	ons
Compution  Composition  Compos		Ť.		⊙ Down ○ Up	
Commissioning     Diagnostics     Gasenal source files     Get Cargo		t		Oup	
Disgnostics     Disgnostics     General source files     General source files		t.	<b>^</b>	2 A	
External source files     A Querte files			Data automa	2 A	
PLC tags					
			Dava exchange	- me	
			e: PROFidrive	Replace with:	
Watch and force tables		"		Neparce min.	
Coline backups		Data connection			
Traces		Drive	e: <select drive=""></select>	Device	
OPC UA communication	- PLC_1 [CPU 1511-1 PN]		7	From current position	
Ga Device proxy data	Local modules	Name	Device type	O Selection	
2 Program info	- H PROFINET IO-System (1	100) Drive_1	Standard Te	Replace Repl	ace all
FLC supervisions & elerms	146-8	Unve_1	Standard le	> septace tops	
Details view			ostic	s 👘 👘 🗸 🗸 Languages & resou	irces
Details view     General	-				
General		-		Editing language:	
				English (United States)	- R
Name No					
No				Reference language:	
No			any	English (United States)	
	1			(crigital (drived states)	100

In the "Data exchange with the drive" view, set the values of "Reference speed", "Maximum speed", and "Reference torque" based on the settings of parameters P01.06, P01.07, and P01.04.

	Ξ. 4	M6-F-STD3 → PLC_1 [CPU 15	11-1 PN	+ Technology object	s + SpeedAxis_1 [D	81]	_ # = X	Tasks	
levices						Function view	Parameter view	Options	
	111 12	* 888							
		Basic parameters	0					✓ Find and replace	
1 M6-F-STD3		· Hardware interface	ŏ	Data exchange with th	ie drive			<ul> <li>Find and replace</li> </ul>	
Add new device		Drive	ŏ					find:	
Devices & networks		Data exchange with the drive	٦ŏ.					Tank.	
PLC 1 [CPU 1511-1 PN]		· Estended parameters	0			Dri	ve		
Device configuration		Mechanics	ŏ					Whole words only	
Conline & disposition		Dynamic default values					Power	Match case	
Software units		Emergencystop	000		PLC .			Find in substructures	
Program blocks		- Limits	õ		(Linear Street of Street Stree			Find in hidden texts	
Technology objects		Dynamic limits	õ				1		
Add new object		Torque limits	ē				- 2	Use wildcards	
- C SpeedAxis 1 (DB1)								Use regular expression	ons
Configuration					_		1		
Commissioning							_	Down	
S Dispnostics					- <b>T</b>	<b>†</b>		O Up	
External source files			- 6			Data exchange		Find	
PLC tests									
PLC data types				Drive data				Replace with:	
Watch and force tables				Drive data					
Online backups					Drive telegram:	Standard telegram 3	Devi	(*) Whole document	
Traces						1			
OPC UA communication								O From current position	
Device proxy data						Automatically apply drive		<ul> <li>Selection</li> </ul>	
Program info				1		Automatically apply drive	values at runtime (online	Replace Repl	lace all
PLC supervisions & alarms					Reference speed:	3000.0	1/min 1 The para		
Details view					Maximum speed:	5000.0	1/min match sp	✓ Languages & resor	urces
recards were					Reference torque:		Nm		
					neierence sorque:	LIES A	nin	Editing language:	
								English (United States)	- F -
ame				Additional data					
				4 11			2	Reference language:	
	_			E-1 C-4	Q. Properti	es 🐧 Info 💶 🖔 Di	annostics	English (United States)	

Function blocks for the speed axis include: MC\_Power, MC\_Reset, MC\_Velocity, MC\_Halt, and MC\_MoveJog.

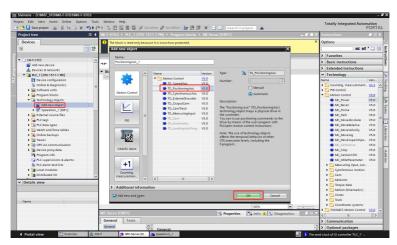




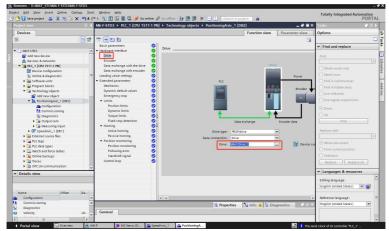
## 7.9.2 TO\_PositioningAxis

### 7.9.2.1 S7-1500 configuration

Click successively the following items: "Technology objects"  $\rightarrow$  "Add new object"  $\rightarrow$  "TO\_PositioningAxis"  $\rightarrow$  "OK".



Select "M6-F" in the "Drive" view.



Select the encoder type (incremental/absolute) in accordance with the actual model.

	E 🖌 N	6-F-STD3 → PLC_1 [CPU 1511	-1 PN	Technology objects      PositioningAxis_1	[DB2]	_ # = ×	Tasks	
Devices					Function view	Parameter view	Options	
		t de la						
		Basic parameters	0				<ul> <li>Find and replace</li> </ul>	
M6-F-STD3	A -	Hardware interface	6	Encoder			- I mo and replace	
Add new device		Drive	õ				Find:	
Devices & networks		Encoder	ā					
- DI PLC 1 [CPU 1511-1 PN]		Data exchange with the drive	ŏ		Driv	e		
Dr Device configuration		Data exchange with encoder	õ			-	Whole words only	
Coline & diagnostics		Leading value settings	õ			Frank	Match case	
Software units		Extended parameters	ŏ	PLC		- One	Find in substructures	
Program blocks		Mechanics	õ				Find in hidden texts	
• Can Technology objects		Dynamic default values	0			Encoder		
Add new object		Emergency stop	0				Use wildcards	
<ul> <li>ResitioningAvis_1 (082)</li> </ul>		▼ Limits	õ	_		214	Use regular expressions	
Configuration		Position limits	õ					
Commissioning		Dynamic limits	õ			-	Down	
Q Disgnostics		Torque limits	ō.		<b>↑</b>	•	Oup	
Output cam		Fixed stop detection	0		ata exchange	Encoder data	Find	
Measuring input		* Homing	0					
General SpeedAvis_1 [DB1]		Active homing	0				Replace with:	
Sai External source files		Passive homing	0	Data connection:	Encoder	-		
PLC tags		· Position monitoring	0				Whole document	
Cill PLC data types		Position monitoring	0	Encoder:	M6F.Drive_1_Encoder1	🕅 Devic		
Watch and force tables		Following error	0	Encoder type:		•	O From current position	
Galine backups		Standstill signal	000000000000000000000000000000000000000				<ul> <li>Selection</li> </ul>	
Traces		Control loop	0				Replace Replace al	
OPC UA communication	~							
Details view	1.0						✓ Languages & resources	
Decentr thete								
							Editing language:	
							English (United States)	
ame Offset	Da.,							
Configuration	-			¢ =		>	Reference language:	
Commissioning				2411-021			English (United States)	

In the "Data exchange with the drive" view, set the values of "Reference speed", "Maximum speed", and "Reference torque" based on the settings of parameters P01.06, P01.07, and P01.04.

	0 4 M6-F-STD3 > PLC_1 [CPL	1511-1 PN)	Technology objects	PositioningAxis_	1 [DB2]		_ # # X	Tasks	
Devices					Function view	Parame	ter view	Options	-
	Basic parameters								-
M6-F-STD3	→ Hardware interface	ĕ	Data exchange with the	drive				<ul> <li>Find and replace</li> </ul>	
Add new device	Drive	× .						Find	
Devices & networks	Encoder	ă							
PLC 1 [CPU 1511-1 PN]	Data exchange with the	nve 🥝			c c	Drive			
Device configuration	Data exchange with enco					-		Whole words only	
Coline & disgnostics	Leading value settings						Power	Match case	
> Software units	<ul> <li>Extended parameters</li> </ul>	ŏ		PLC				Find in substructures	
Program blocks	Mechanics	0		(Local)		0 1		Find in hidden texts	
Technology objects	Dynamic default values	õ				1007	Encoder 1		
Add new object	Emergency stop	ō					and the second second	Use wildcards	
FostioningAsis_1 [D82]	✓ Limits	õ		_			212	Use regular expressions	
Configuration	Position limits	ō						( Down	
Commissioning	Dynamic limits	0			_				
Q Diegnostics	Torque limits	0.		- <b>T</b>		Ť		Oup	
Dutput cam	Fixed stop detection	0			Data exchange	Encoder de	ite	Find	
Measuring input	✓ Homing	0.							
SpeedAsis_1 [DB1]	Active homing	0	Drive data					Replace with:	
> get External source files	Passive homing	0	Drive data						
PLC tegs	<ul> <li>Position monitoring</li> </ul>	0		Drive telegram:	Standard telegram 3	-	Devis	(  ) Whole document	
Cel PLC data types	Position monitoring	8							
Watch and force tables	Following error	8			Automatically apply dri			<ul> <li>From current position</li> </ul>	
Online backups	Standstill signal							Selection	
Traces	Control loop	0			Automatically apply dri	the values at nuo	ime (online	Replace Replace all	
OPC UA communication	-			Reference speed:	3000.0	1/min 1	The parai		
Details view				Maximum speed:	5000.0	1/min	match sp configure	<ul> <li>Languages &amp; resources</li> </ul>	
Details New					122	Nm	compose		
				keterence torque:	1220	rem		Editing language:	
			Additional data					English (United States)	2
lame Offset	De.		Additional data						
Configuration	^		< m				>	Reference language:	
Commissioning				Ropertie	s 🐧 Info 🔒 🖏 I				
Disgnostics				S Propertie	s 📴 info 🖬 🕲 i	unagnostics	<b>Print</b>	singer (connect staties)	
Velocity	UR General							(	

The settings for the 23-bit absolute encoder is as shown below.

	M6-F-STD3 + PLC_1 [CPU 1511-1 Pf	Fechnology objects + PositioningAxis_1 [DB2]	_ # = ×	Tasks 🖬 🛙
Devices		Function view	Parameter view	Options
	92 * 9865		3	
	Basic parameters	nc		<ul> <li>Find and replace</li> </ul>
M6-F-STD3	➤ Hardware interface	nu		<ul> <li>Find and replace</li> </ul>
Add new device	Drive O		Encoder 1	Find:
d Devices & networks	Encoder			
• 📴 PLC_1 [CPU 1511-1 PN]	Data exchange with the drive		AX.	
Device configuration	Data exchange with encoder			Whale words only
Q Online & disgnostics	Leading value settings			Match case
Software units	Extended parameters	T T T	-	Find in substructures
Program blocks	Mechanics 🥝	Data exchange	Encoder data	Find in hidden texts
<ul> <li>Technology objects</li> </ul>	Dynamic default values 🥝			Use wildcards
Add new object	Emergency stop	Encoder data		
PositioningAsis_1 [D82]	Umits     Position limits     Dynamic limits     Torque limits     Torque limits     Fixed stop detection     Viteming	Encoder data		Use regular expressions
Configuration	Position limits	Encoder telegram: Standard telegram 3	Devi	( Down
Commissioning	Dynamic limits			
S Diegnostics	Torque limits 🥑	Automatically apply encode	5 5 5 6	O Up
🕨 📴 Output cam	Fixed stop detection			Find
Measuring input	Homing     ⊘	Automatically apply encode	r values during runtime	
E SpeedAxis_1 [D81]	Active horning O Passive horning O Position monitoring O Position monitoring O Following error O			Replace with:
External source files	Passive homing 🥑	Measuring system: Rotary	The para	
PLC tags	<ul> <li>Position monitoring</li> </ul>		mustme	( ) Whole document
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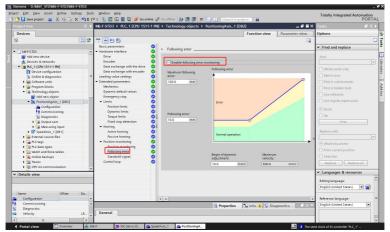
The settings for the 2500-line incremental encoder is as shown below.

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▼ 1 M6F6TD3			Power	<ul> <li>Find and replace</li> </ul>
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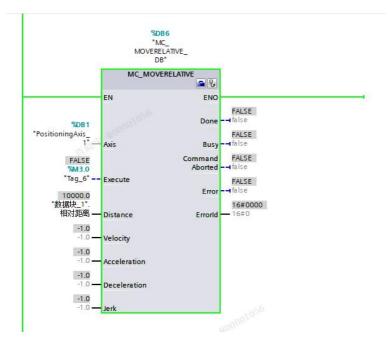
Set the values in the following image based on the corresponding items of the actual mechanical configuration.

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* 🔄 PLC_1 (CPU 1511-1 PN)						Whole words only	
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S Online & diagnostics		Leading value settings					
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The "Enable following error monitoring" selection can be canceled.



Function blocks for the position axis include: MC\_Power, MC\_Reset, MC\_Velocity, MC\_Halt, MC\_MoveJog, MC\_MoveRelative, and MC\_MoveAbsolute.



### 7.9.2.2 S7-1200 configuration

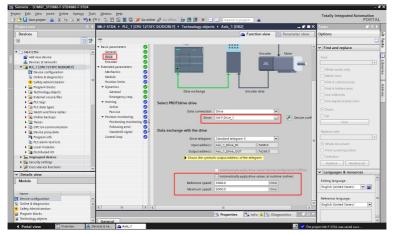
Click successively the following items: "Technology objects"  $\rightarrow$  "Add new object"  $\rightarrow$  "TO\_PositioningAxis"  $\rightarrow$  "OK".

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8		Add new object					×			
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M6-F-STD4	~	Name: Axis 1		-			H.	Taddress		644
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· DI PLC 1 (CPU 1215FC DC/DC/RLY)		-	Name	Version	Туре: 🙏	TD_PositioningAxis	_ P_		> CPU	
Device configuration			<ul> <li>Motion Control</li> </ul>	<u>V8.0</u>	Number:		a .	0.1	> 📑 Signal boards	
S Online & diagnostics			-400:				-	64.67	• Communications boa	ards
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Technology objects			TO_CommandTable	V8.0	10.00		16	1000	> 00 00	
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					You can intue post	tioning commands to the	20	1016	AllAO	
Cell PLC data types		PID			drive by means of t	he user program with	21	1020	Communications mo	
<ul> <li>Watch and force tables</li> </ul>					PLCopen motion co	introl instructions.	32		Technology modules	
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		Startup	Con	nment:						
		Cycle							57-1200 CPU	
		Communication load	~							
	1							100		

In the "General" view, select "PROFIdrive" and the unit in "Position unit".

Project tree	1 4		ne 🖉 Gooffine 🎄 🖪 📑 😿 - 🔛 -Search in projects 👍 FC DC/DC/RLY] 🕨 Technology objects 🕨 Axis 1 [DB2]	- # # X	Tasks 🗰
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버	💷 🐋				
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📥 Devices & networks		Encoder 🥏	Technology object - Axis		
DELC_1 [CRU 1215FC DODORLY]		• Extended parameters	Avis name: Avis 1		Whole words only
Device configuration		Mechanics 🥝			Match case
Online & diagnostics		Modulo 🥝			
<ul> <li>Safety Administration</li> </ul>		Position limits 🥑			Find in substructures
🕨 🙀 Program blocks		🕶 Dynamics 😔		N 11	Find in hidden texts
Technology objects		General 🥑		P P D	Use wildcards
External source files		Emergency stop 🥏			
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PLC data types		Active 🥑	User program Technology object - PRO Fidrive	Drive	Down
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<ul> <li>Online backups</li> </ul>		▼ Position monitoring	and the second		⊖ up
🕨 📴 Traces		Positioning monitoring 📀 🕅	Drive		Find
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<ul> <li>Device proxy data</li> </ul>		Standstill signal  😔	Analog drive connection		Replace with:
Program info		Control loop			
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Local modules					From current position
<ul> <li>Distributed I/O</li> </ul>			Unit of measurement		
Ungrouped devices			Position unit: mm	•	<ul> <li>Selection</li> </ul>
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Cross-device functions	~		Simulation		
Details view		1	Simulation: No simulation	•	✓ Languages & resources
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Device configuration	^	General			Reference language:
Online & diagnostics	22	General			English (United States)
Safety Administration					
Program blocks		No 'properties' availab			

Select "M6-F.Drive\_1" in the "Drive" view. Set the values of "Reference speed" and "Maximum speed" based on the settings of parameters P01.06 and P01.07.



Select "Encoder on PROFINET/PROFIBUS" in "Encoder connection". Select "M6-F\_Drive\_1\_Encoder1" in "PROFIdrive encoder".

		M6-F-STD4 + PLC_1 [CPU 1215			Gearch in project> s ► Axis 1 [D82]		- 6 E X	Tasks	
Devices						ction view	Parameter view	Options	
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		• Basic parameters					-	<ul> <li>Find and replace</li> </ul>	
1 M6-F-STD4	^	General 🥝							
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A Devices & networks		Encoder		Data exchange	Enco	der data			
· DE PLC_1 (CPU 1215FC DODORLY)		Extended parameters						Whole words only	
Device configuration		Mechanics 🥝	Encoder conr	ection					
😼 Online & diagnostics		Modulo 🥝			Encoder on PROFINETP	000000		Match case	
Safety Administration		Position limits						Find in substructures	
Program blocks		<ul> <li>Dynamics</li> </ul>			C Encoder on high-speed	counter (HSC)		Find in hidden texts	
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🕨 📴 Traces		Positioning monitoring 🥑						Find	
OPC UA communication		Following error 🥑	Data exchange	ge with encoder					
Device proxy data		Standstill signal 📀 🗸						Replace with:	
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TLC alarm text lists				Input address:	Axis_1_Drive_IN	%168.0		Whole document	
Local modules				Output address:	Axis_1_Drive_OUT	%065.0		100 C	
Distributed IID					Invert encoder directio	0		<ul> <li>From current position</li> </ul>	
Ungrouped devices								<ul> <li>Selection</li> </ul>	
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			Encoder type						-
								engistr (onited states)	
Name				Encoder type:	Rotary incremental				
Device configuration	^			Steps per revolution:	2048			Reference language:	
Online & diagnostics								English (United States)	
Safety Administration									

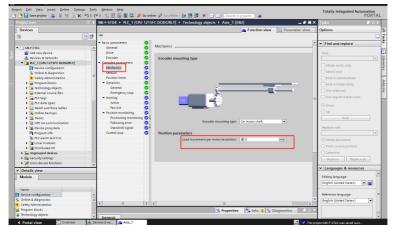
Cancel the selection of "Automatically apply encoder values at runtime (online)". The settings of the 23-bit absolute encoder are as shown below.

	I 4 M6-F-STD4 + PLC_1 [CPU 121]	FC DODC/RLY]   Techr	nology objects	<ul> <li>Axis_1 [DB2]</li> </ul>		_ # = ×	Tasks	7 10
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	9 🕸 😤							
	- Basic parameters					^	<ul> <li>Find and replace</li> </ul>	_
1 M6-F-STD4	A General	-						
Add new device	Drive 🥥	Encoder selection					Find:	
A Devices & networks	Encoder	Da	ta connection: E	incoder				
Ig PLC_1 (CPU 1215FC DODORLY)	👻 Extended parameters 🧔			46-F.Drive 1 Encoder1		Device conf	Contractor	
Device configuration	Mechanics 🥝	PROFI	ianve encoder:	Ae-P.Drive_1_Encodern		Device com	Whole words only	
S Online & diagnostics	Modulo 🥑						Match case	
Safety Administration	Position limits	Data exchange with	encoder				Find in substructures	
Program blocks	👻 Dynamics 😔						Find in hidden texts	
Technology objects	General 🥑	Enci	oder telegram: S	itandard telegram 3				
se External source files	Emergency stop 🥏		Input address: A	kis_1_Drive_IN	%/68.0		Use wildcards	
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Program info	Control loop							
PLC alarm text lists		Encoder type					Whole document	
Cal modules				lotary absolute	100			
Distributed I/D							<ul> <li>From current position</li> </ul>	
Ungrouped devices		Steps	per revolution: 3	1388608			<ul> <li>Selection</li> </ul>	
Security settings		Number	of revolutions: 5	12			Replace Replace all	
Cross-device functions								2
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Device configuration	^						Reference language:	
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Safety Administration		<						
Program blocks			1	Properties 1 Inf	o 💶 🐰 Diagne	ostics		
Technology objects	<ul> <li>General</li> </ul>							
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Portal View	M DEVICES & NE AUS_1					mil 💙 The pr	oject Mo-F-STD4 was saved succ	
				232				

Cancel the selection of "Automatically apply encoder values at runtime (online)". The settings of the 2500-line incremental encoder are as shown below.

<mark>B 🔚 Save project 🛛 👗 🗶 💷 🕞 :</mark> roject tree	E 4	M6-F-STD4 + PLC_1 [CPU 121				_ # = ×	Tasks	<b>P</b> II
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		• Basic parameters				0	<ul> <li>Find and replace</li> </ul>	_
1 M6-F-STD4		General 🥥					<ul> <li>Find and replace</li> </ul>	
Add new device	-	Drive	Encoder se	lection			Find:	
Devices & networks		Encoder		Data connection:	Encoder		1.112.	
· PLC_1 [CPU 1215FC DODORLY]		Extended parameters				-	_	
Device configuration		Mechanics 🥝		PROFidrive encoder:	M6-F.Drive_1_Encoder1	Device confi	Whole words only	
Gnine & disgnostics		Modulo 🧭					Match case	
Safety Administration	10	Modulo 🥝 Position limits 🥝	Data excha	ance with encoder			Find in substructures	
Program blocks		Dynamics					Find in hidden texts	
Technology objects		General 🥥		Encoder telegram:	Standard telegram 3			
• 🙀 External source files		Emergency stop		Input address:	Axis_1_Drive_IN %68.0		Use wildcards	
PLC tegs		• Homing 🥥		Output address:	Avis 1 Drive OUT 9068.0		Use regular expressions	
Call PLC data types		Active 🥝			Invert encoder direction		0.0	
Watch and force tables		Passive 🥝			[] Invert encoder direction		Down	
Gnine backups		<ul> <li>Position monitoring</li> </ul>					O Up	
• 📴 Traces		Positioning monitoring 🥝			Automatically apply encoder values durin	g configuration (offline)	Find	
OPC UA communication		Following error			Automatically apply encoder values at run	time (online)		
Gevice proxy data		Standstill signal 🥝					Replace with:	
E Program info		Control loop						
1 PLC alarm text lists		-	Encoder ty	pe			(a) Whole document	
Local modules					Rotary incremental		0	
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Lingrouped devices				Steps per revolution:	10000		O Selection	
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Cross-device functions	~							
Details view			Fine resolu	rtion			✓ Languages & resources	
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Name							100	
Device configuration	^						Reference language:	
Online & diagnostics		< = >				>	English (United States)	
Safety Administration			<u></u>			/		

Set the value in the following image based on the corresponding item of the actual mechanical configuration.



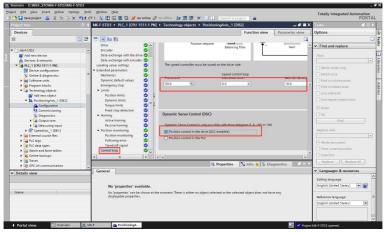
The "Enable following error monitoring" selection can be canceled.

oject tree 0	M6-F-STD4 > PLC_1 (CPU 1215	FC DC/DC/RLY] + Technology objects + Axis_1 [D82]	🕻 Tasks 🗰 🗓
Devices		Section view	Options
8			
	Basic parameters		<ul> <li>Find and replace</li> </ul>
0 M6FSTD4	A General	Following error	<ul> <li>Find and replace</li> </ul>
Add new device	Drive		Find:
Devices & networks	Encoder	Enable following error monitoring	
PLC_1 [CPU 1215FC DODORLY]	Extended parameters	Ensue lorowing end monitoring	· · · · · · · · · · · · · · · · · · ·
Device configuration			Whole words only
Coline & diagnostics	Madulo	Maximum following error: Following error	Match case
<ul> <li>Safety Administration</li> </ul>	Mechanics     Modulo     Position limits	100.0 mm	Find in substructures
Grogram blocks	• Dynamics		
Technology objects	General		Find in hidden texts
External source files	Emergency stop		Use wildcards
PLC tags	Homing	tror	Use regular expressions
PLC data types	Active		
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	Positioning monitoring	10.0 mm	End
GPC UA communication			End
	Following error Standstill signal	Normal operation	Replace with:
Bevice proxy data	Standstill signal		
E Program info	Control loop	Velocity	e
PLC alarm text lists		Start dynamic adjustment: 1	Whole document
Local modules		Meximum velocity:	O From current position
Distributed I/D		10.0 mm/s 1500.0 mm/s	
Engrouped devices		international in	Selection
Security settings			Replace Replace all
Cross-device functions	*		
Details view			✓ Languages & resources
Module			Editing language:
	_		English (United States)
Name			
Device configuration	^		Reference language:
Online & diagnostics			English (United States)
Safety Administration	<		
Program blocks		Roperties 🚺 Info 🔒 🖏 Diagnostics	2

Function blocks for the position axis include: MC\_Power, MC\_Reset, MC\_Velocity, MC\_Halt, MC\_MoveJog, MC\_MoveRelative, and MC\_MoveAbsolute.

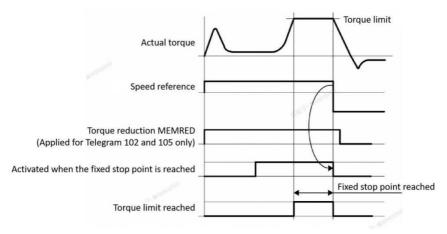
## 7.9.3 DSC

When configuring the positioning axis or the synchronous axis using the Standard Telegram 5 or the Siemens Telegram 105, the Dynamic Servo Control (DSC) can be applied. Parameter P17.01 = 10000 + telegram number. For example, when the Standard Telegram 5 is used with the DSC function, P17.01 is set to 10005, and, when the Siemens Telegram 105 is used with the DSC function, P17.01 is set to 10105.

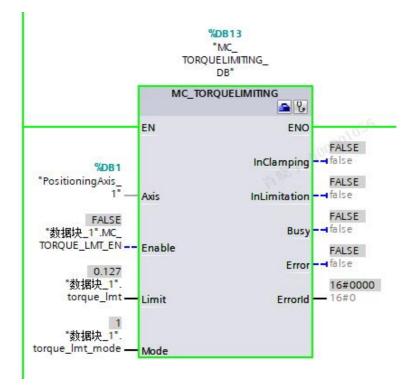


## 7.9.4 Fixed stop point mode

With the Siemens Telegram 102 or 105, PLC is able to apply the fixed stop point function for the axis technology object. The function block MC\_Torquelimiting of "PLC open" is used for the purpose.



When using the MC\_Torquelimiting block, the setting of mode = 1 will activate the fixed stop point function. Limit is used to set the torque limit value. MEMRED refers to the torque reduction value, where 0x4000 corresponds to 300% of the torque reduction value. When Limit is set to 0.127 and the torque limit is set to 10%, MEMRED = (3.81-0.127)\*0x4000/3.81 = 15838.



# 7.10 Siemens Telegram 111

The PLC performs the basic positioning function of M6-F via the Siemens Telegram 111 and the function block SINA\_POS (FB284). The running modes include: jog, homing, MDI relative positioning, MDI absolute positioning, continuous running, and traversing block.

## 7.10.1 FB284 introduction

	Туре	Default	Description		
Input					
			Running mode:		
ModePos	INT	0	1 = Relative positioning		
			2 = Absolute positioning		

Introduction of the FB284 function block port is as shown below.

	Туре	Default	Description
			<ul> <li>3 = Constant-speed running (Setup mode)</li> <li>4 = Active homing (Reference point approach)</li> <li>5 = Home position direct setting (Set reference point)</li> <li>6 = Traversing block (0 to 31)</li> <li>7 = Jog (Velocity-dependent)</li> <li>8 = Jog (Distance-dependent)</li> </ul>
EnableAxis	BOOL	0	Servo running command: 0 = Stop (OFF1) 1 = Start
CancelTraversing	BOOL	1	0 = Cancel the currently running task 1 = Not cancel the currently running task
IntermediateStop	BOOL	1	Pause the running task: 0 = Pause the currently running task 1 = Not pause the currently running task
Positive	BOOL	0	Positive direction
Negative	BOOL	0	Negative direction
Jog1	BOOL	0	Jog signal 1
Jog2	BOOL	0	Jog signal 2
FlyRef	BOOL	0	0 = Not choose homing during running 1 = Choose homing during running
AckError	BOOL	0	Fault reset
ExecuteMode	BOOL	0	Mode of activating the request
Position	DINT	0 [LU]	Position reference when ModePos is set to 1 or 2 Program segment number when ModePos is set to 6
Velocity	DINT	0 [1000 LU/min]	Speed reference when ModePos is set to 1, 2, or 3
OverV	INT	100 [%]	Set the speed percentage 0 to 199%
OverAcc	INT	100 [%]	Set the acceleration percentage 0 to 100% when ModePos is set to 1, 2, or 3

	Туре	Default	Descr	iption			
OverDec	INT	100 [%]	Set the deceleration percentage to 1, 2, or 3	0 to 100% when ModePos is set			
			This parameter enables the relative functions for basic positioning. The corresponding functions of bits are shown below.				
			ConfigEPos	Bit function description			
			ConfigEPos.%X0	OFF2 stop			
			ConfigEPos.%X1	OFF3 stop			
			ConfigEPos.%X2	Activate software limit			
ConfigEPOS	DWORD	0	ConfigEPos.%X3	Activate hardware limit			
			ConfigEPos.%X6	Zero position switch signal			
			ConfigEPos.%X7	External program block switchover			
			ConfigEPos.%X8 when ModePos = 2, or 3	It allows the continuous change of the reference values and allows the changes to take effect immediately.			
HWIDSTW	HW_IO	0	Hardware identifier of the Telegram 111 in the M6-F Device vi				
HWIDZSW	HW_IO	0	Hardware identifier of the Telegr	ram 111 in the M6-F Device view			
	1	1	Output				
AxisEnabled	BOOL	0	Drive enabled				
AxisPosOk	BOOL	0	Target position reached				
AxisSpFixed	BOOL	0	Set position reached				
AxisRef	BOOL	0	Reference point set				
AxisWarn	BOOL	0	Drive alarm				
AxisError	BOOL	0	Drive fault				
Lockout	BOOL	0	The drive is in the connection prohibit state. Check whether Pin 0 and Pin 1 of the ConfigEPos control bit have been set to 1.				
ActVelocity	DINT	0	Actual speed [the hexadecimal 4 speed value set via P01.07]	0000000h corresponding the			

	Туре	Default	Description
ActPosition	DINT	0	Present position LU
ActMode	INT	0	Currently activated running mode
EPosZSW1	WORD	0	EPOS ZSW1 status
EPosZSW2	WORD	0	EPOS ZSW2 status
ActWarn	WORD	0	Present alarm code of the drive
ActFault	WORD	0	Present fault code of the drive
Error	BOOL	0	1 = Existing error
Status	Word	0	16#7002: No existing error; the function block is working.
DiaglD	WORD	0	Existing communication error; error occurred while executing the SFB call.

- Set EnableAxis to 1 to enable the axis. If the axis is ready and there is no existing error of the drive (AxisError = 0), the output AxisEnabled signal changes to 1.
- The input signal CancelTraversing and IntermediateStop are effective for all running modes except for jogging. Set the signal to 1 when running EPOS.
- If the program has executed the variable assignment on ConfigEPos, it is required to confirm that the initial value is set to 3 (That is to set ConfigEPos.%X0 and ConfigEPos.%X1 to 1; if not activated, OFF2 and OFF3 stop staying effective).
- Command unit:

Position reference unit: PUU (User command unit)

Speed reference unit: 1000 PUU/min

Position feedback unit: PUU

Speed feedback unit: 0.1 rpm

## 7.10.2 MDI relative positioning (Mode 1)

Steps and conditions:

- 1. Select the running mode ModePos = 1;
- 2. Set the drive running command EnableAxis = 1;
- 3. Set the target position and target speed via the input parameters Position and Velocity;
- 4. Set the percentage of speed, acceleration, and deceleration via the input parameters OverV, OverAcc, and OverDec; it is required to set the running conditions CancelTraversing and IntermediateStop to 1, and set Jog1 and Jog2 to 0;

- 5. In relative positioning, the running direction is determined by the positive/negative property of the set value of Position;
- 6. The positioning motion is triggered by the rising edge of ExecuteMode;
- 7. When the target position is reached, set to 1 via AxisPosOk.

## 7.10.3 MDI absolute positioning (Mode 2)

- 1. Select the running mode ModePos =2;
- 2. Set the drive running command EnableAxis = 1;
- 3. Set the target position and target speed via the input parameters Position and Velocity;
- 4. Set the percentage of speed, acceleration, and deceleration via the input parameters OverV, OverAcc, and OverDec; it is required to set the running conditions CancelTraversing and IntermediateStop to 1, and set Jog1 and Jog2 to 0;
- 5. In absolute positioning, the running direction is determined by the positive/negative property of the set value of Position;
- 6. The positioning motion is triggered by the rising edge of ExecuteMode;
- 7. When the target position is reached, set AxisPosOk to 1.

### 7.10.4 Constant-speed running (Setup mode; Mode 3)

- 1. Select the running mode ModePos =3;
- 2. Set the drive running command EnableAxis = 1;
- 3. Set the target speed via the input parameter Velocity;
- 4. Set the percentage of speed, acceleration, and deceleration via the input parameters OverV, OverAcc, and OverDec; it is required to set the running conditions CancelTraversing and IntermediateStop to 1, and set Jog1 and Jog2 to 0;
- 5. The running direction is determined by Positive and Negative;
- 6. The positioning motion is triggered by the rising edge of ExecuteMode;
- 7. When the target position is reached, set AxisPosOk to 1.

### 7.10.5 Active homing (Reference point approach; Mode 4)

- 1. Select the running mode ModePos =4;
- 2. Set the drive running command EnableAxis = 1;

- 3. The homing switch status is transmitted to M6-F through ConfigEPos.%X6, or obtained by directly setting the homing switch I/O function of M6-F;
- 4. Set the percentage of speed, acceleration, and deceleration via the input parameters OverV, OverAcc, and OverDec; it is required to set the running conditions CancelTraversing and IntermediateStop to 1, and set Jog1 and Jog2 to 0;
- 5. The method of homing is set via P12.01;
- 6. The positioning motion is triggered by the rising edge of ExecuteMode;
- 7. When the target position is reached, set AxisPosOk to 1.

		0: Homing in forward direction, and the home switch as the deceleration point and the home position;
		1: Homing in backward direction, and the home switch as the deceleration point and the home position;
		2: Homing in forward direction, and the motor Z pulse as the deceleration point and the home position;
		3: Homing in backward direction, and the motor Z pulse as the deceleration point and the home position;
		4: Homing in forward direction, the home switch as the deceleration point, and the motor Z pulse as the home position;
P12.01	Homing mode	5: Homing in backward direction, the home switch as the deceleration point, and the motor Z pulse as the home position;
		6: Homing in forward direction direction, and the positive limit switch as the deceleration point and the home position;
		7: Homing in backward direction, and the negative limit switch as the deceleration point and the home position;
		8: Homing in forward direction, the positive limit switch as the deceleration point, and the motor Z pulse as the home position;
		9: Homing in backward direction, the negative limit switch as the deceleration point, and the motor Z pulse as the home position;
		101 to 135: CiA402 homing mode (1 to 35) + 100

Parameters P17.10 (Homing offset type) and P17.11 (Homing offset) can be used in combination with the homing mode, as shown below:

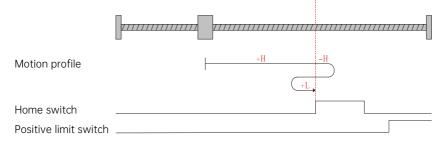
P17.10 = 0, absolute homing; when finished, the homing offset P17.11 is designated as the feedback position;

P17.10 = 1, relative homing; when finished, the added amount of the previous position and the homing offset P17.11 is designated as the feedback position

1) P12.01 = 0, homing mode 0

Homing in forward direction, and the home switch as the deceleration point and the home position.

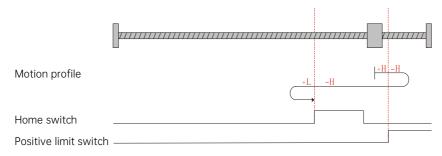
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a high speed and decelerates till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.

		777777777	
Motion profile	+L -H		
Home switch			
Positive limit switch			J

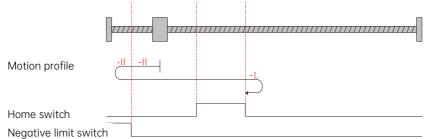
The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



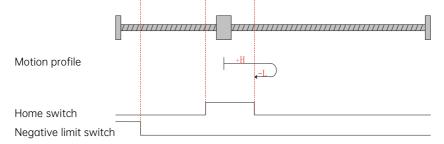
#### 2) P12.01 = 1, homing mode 1

Homing in backward direction, and the home switch as the deceleration point and the home position.

The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stop when the motor reaches the rising edge of the home switch.

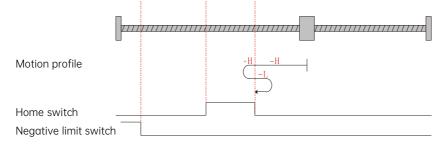


The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



The present motor position is between the home switch and the positive limit switch. When

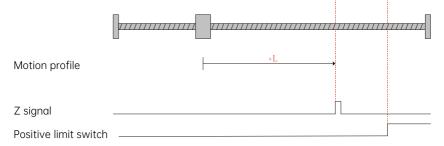
homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



3) P12.01 = 2, homing mode 2

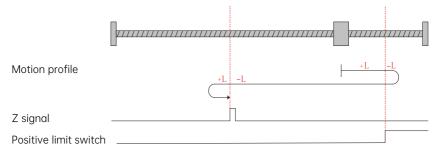
Homing in forward direction, and the Z signal as the deceleration point and the home position.

When there is at least one Z signal between the present motor position and the positive limit switch, homing will be processed in the forward direction at a low speed, and stop when the motor reaches the rising edge of the Z signal.



When the present motor position is at the Z signal, the homing enable will be triggered. The present position will be recognized as the home position immediately, and homing stops.

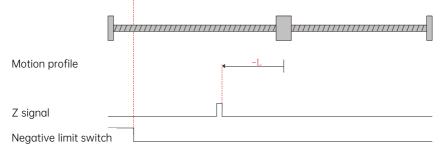
When there is no Z signal between the present motor position and the positive limit switch, homing will be processed in the forward direction at a low speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a low speed till it reaches the falling edge of the Z signal. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the Z signal.



#### 4) P12.01 = 3, homing mode 3

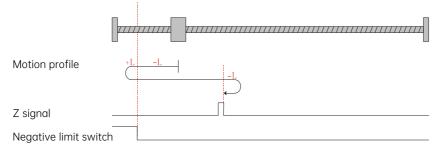
Homing in backward direction, and the motor Z signal as the deceleration point and the home position.

When there is at least one Z signal between the present motor position and the negative limit switch, homing will be processed in the backward direction at a low speed, and stop when the motor reaches the rising edge of the Z signal.



When the present motor position is at the Z signal, the homing enable will be triggered. The present position will be recognized as the home position immediately, and homing stops.

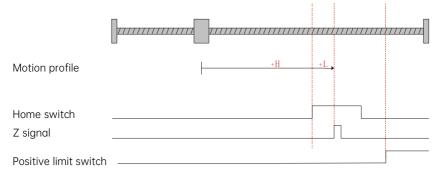
When there is no Z signal between the present motor position and the negative limit switch, homing will be processed in the backward direction at a low speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at low speed till it reaches the falling edge of the Z signal. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the Z signal.



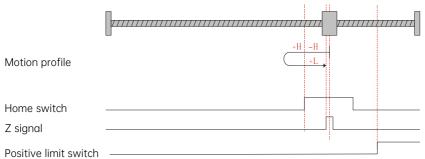
#### 5) P12.01 = 4, homing mode 4

Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

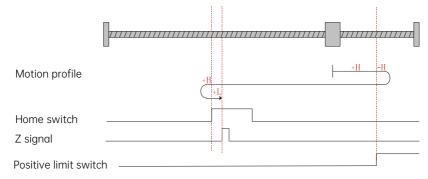
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a high speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing it processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Following that, homing continues in the forward direction at a low speed, and stops when the motor reached the rising edge of the Z signal.

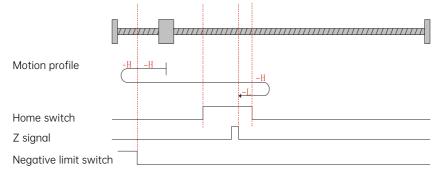


6)

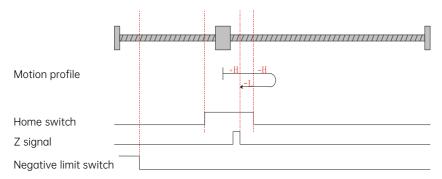
P12.01 = 5, homing mode 5

Homing in backward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

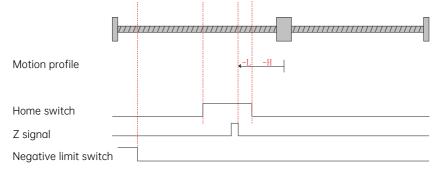
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Following that, homing continues at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



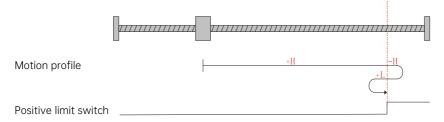
The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a high speed and decelerates till it reaches the rising edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



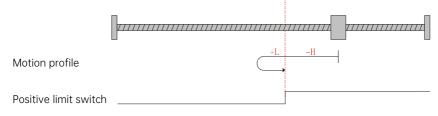
#### 7) P12.01 = 6, homing mode 6

Homing in forward direction, and the positive limit switch as the deceleration point and the home position.

The present motor position is in the non-effective zone of the positive limit switch. When homing starts, the positive limit switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the positive limit switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the positive limit switch.



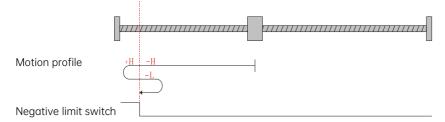
The present motor position is at the positive limit switch. When homing starts, the positive limit switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the positive limit switch. Then , homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the positive limit switch.



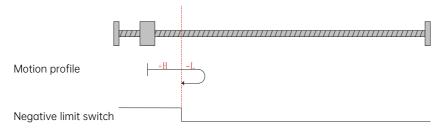
#### 8) P12.01 = 7, homing mode 7

Homing in backward direction, and the negative limit switch as the deceleration point and the home position.

The present motor position is in the non-effective zone of the negative limit switch. When homing starts, the negative limit switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the negative limit switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the negative limit switch.



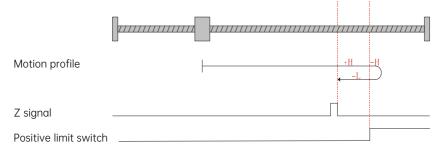
The present motor position is at the negative limit switch. When homing starts, the negative limit switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the negative limit switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the negative limit switch.



9) P12.01 = 8, homing mode 8

Homing in forward direction, the positive limit switch as the deceleration point, and the motor Z signal as the home position.

The present motor position is in the non-effective zone of the positive limit switch. When homing starts, the positive limit switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the positive limit switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is at the positive limit switch. When homing starts, the positive limit switch is at a high level, and homing is processed in the backward direction at a high speed till ti reaches the falling edge of the positive limit switch. Then, homing continues in the backward direction in a low speed, and stops when the motor reaches the rising edge of the Z signal.

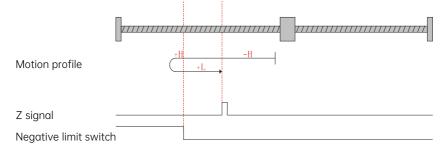
	///////////////////////////////////////		
Motion profile	<u>← -L</u>	-H	
Z signal			
Positive limit switch			

10) P12.01 = 9, homing mode 9

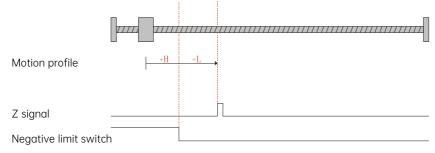
Homing in backward direction, the positive limit switch as the deceleration point, and the motor Z

signal as the home position.

The present motor position is in the non-effective zone of the negative limit switch. When homing starts, the negative limit switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the negative limit switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



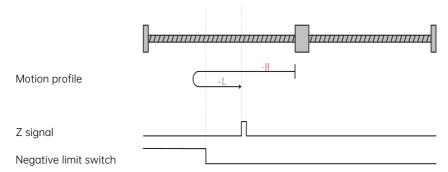
The present motor position is at the positive limit switch. When homing starts, the negative limit switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the negative limit switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



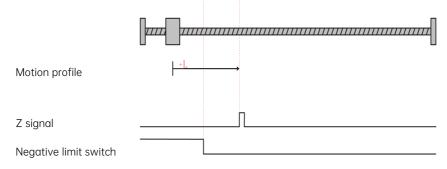
11) P12.01 = 101, homing mode 101

Homing in backward direction, the negative limit switch as the deceleration point, and the motor Z signal as the home position..

The present motor position is in the non-effective zone of the negative limit switch. When homing starts, the negative limit switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the negative limit switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



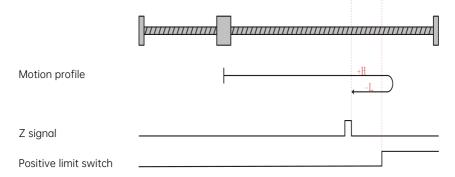
The present motor position is at the negative limit switch. When homing starts, the negative limit switch is at a high level, and homing is processed in the forward direction at a low speed till it reaches the falling edge of the negative limit switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



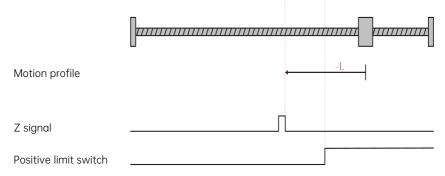
12) P12.01 = 102, homing mode 102

Homing in forward direction, the positive limit switch as the deceleration point, and the motor Z signal as the home position.

The present motor position is in the non-effective zone of the positive limit switch. When homing starts, the positive limit switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a low speed till it reaches the falling edge of the positive limit switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



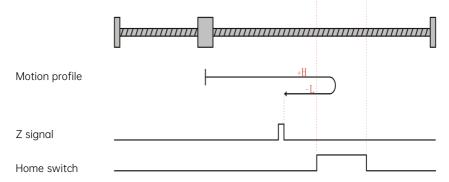
The present motor position is at the positive limit switch. When homing starts, the positive limit switch is at a high level, and homing is processed in the backward direction at a low speed till it reaches the falling edge of the positive limit switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



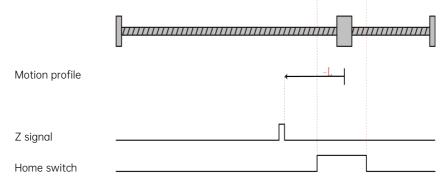
#### 13) P12.01 = 103, homing mode 103

Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a low speed till it reaches the falling edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



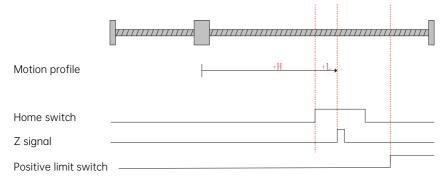
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a low speed till it reaches the falling edge of the home switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



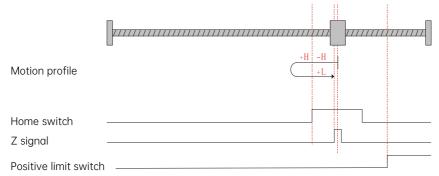
<sup>14)</sup> P12.01 = 104, homing mode 104

Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

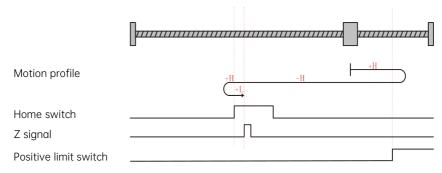
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is the in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



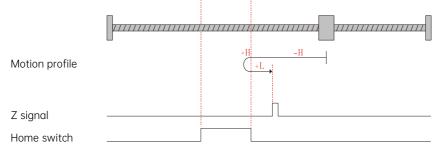
The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Following that, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



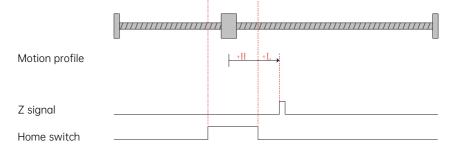
15) P12.01 = 105, homing mode 105

Homing in backward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



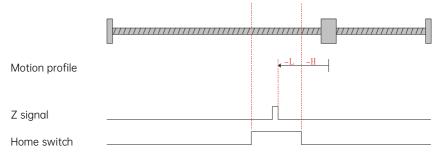
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



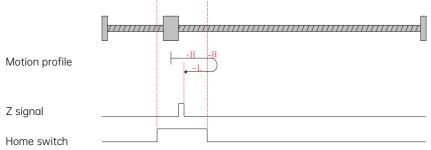
### 16) P12.01 = 106, homing mode 106

Homing in backward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.

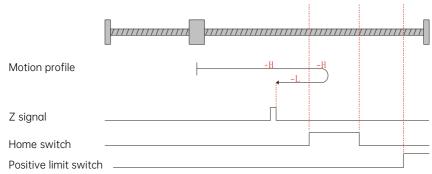


17) P12.01 = 107, homing mode 107

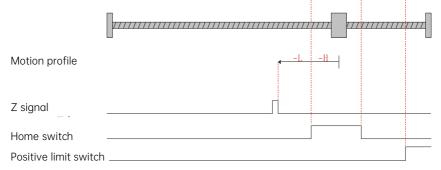
Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the

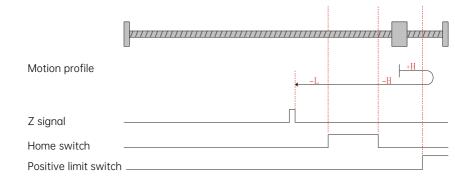
rising edge of the Z signal.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



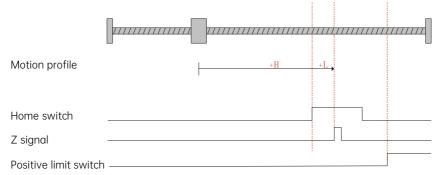
The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



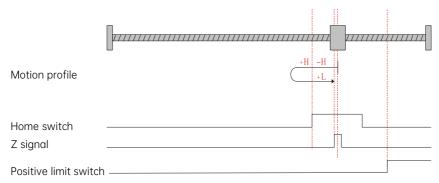
18) P12.01 = 108, homing mode 108

Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

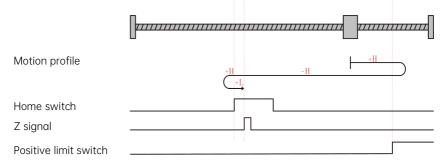
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



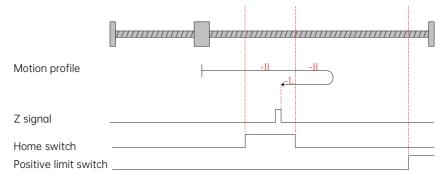
The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Following that, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



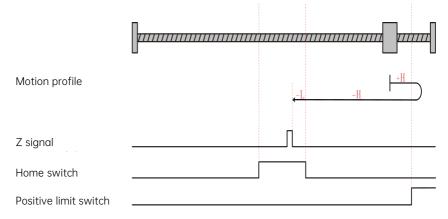
#### 19) P12.01 = 109, homing mode 109

Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

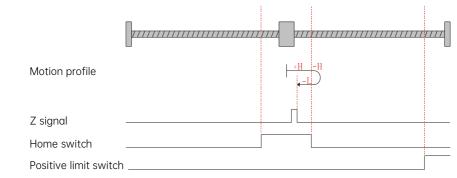
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



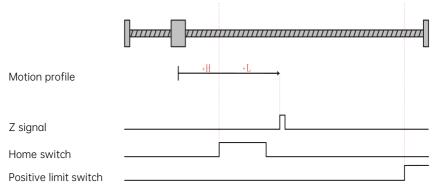
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



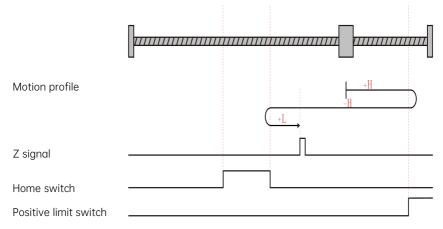
20) P12.01 = 110, homing mode 110

Homing in forward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

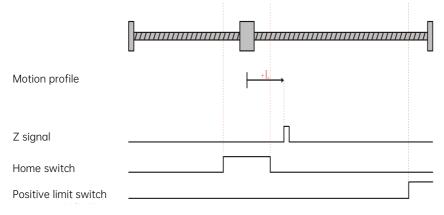
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



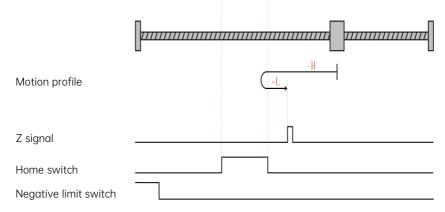
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a low speed. Homing stops when the motor reaches the rising edge of the Z signal.



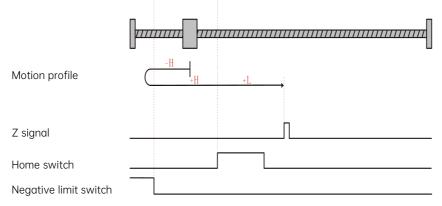
21) P12.01 = 111, homing mode 111

Homing in backward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

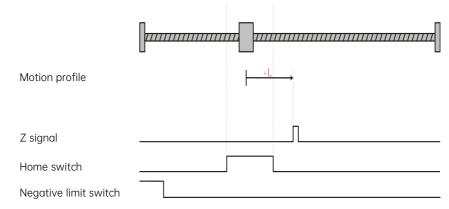
The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



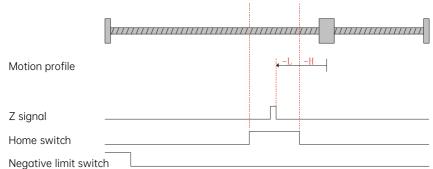
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a low speed. Homing stops when the motor reaches the rising edge of the Z signal.



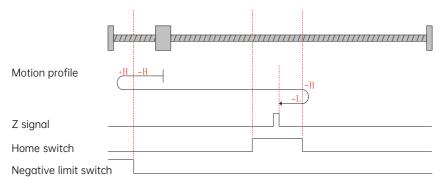
### 22) P12.01 = 112, homing mode 112

Homing in backward direction, the home switch as he deceleration point, and the motor Z signal as the home position.

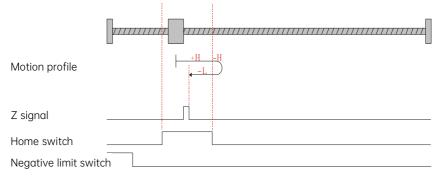
The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.

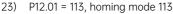


The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Following that, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



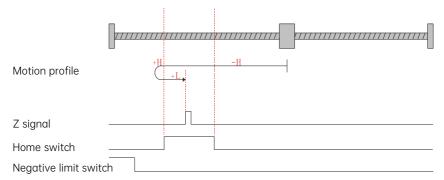
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



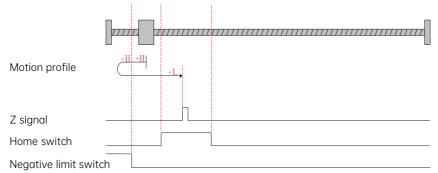


Homing in the backward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

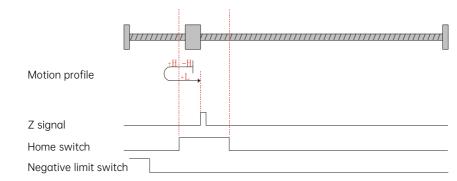
The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



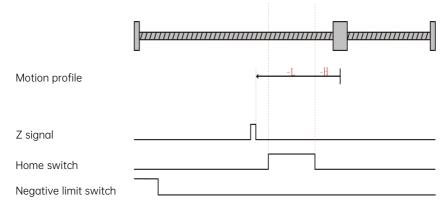
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



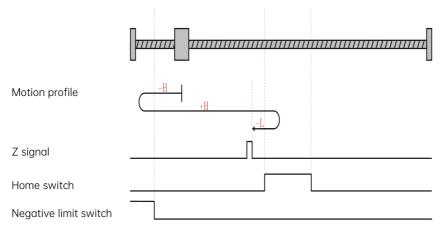
24) P12.01 = 114, homing mode 114

Homing in backward direction, the home switch as the deceleration point, and the motor Z signal as the home position.

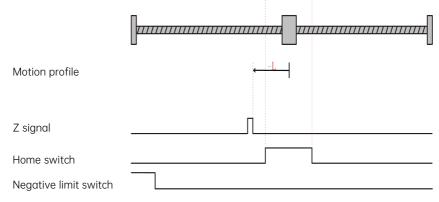
The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the Z signal.



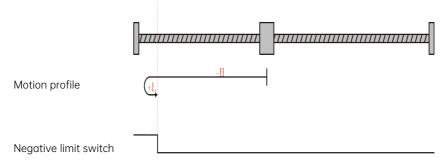
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a low speed. Homing stops when the motor reaches the rising edge of the Z signal.



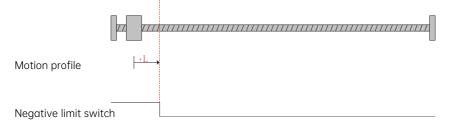
<sup>25)</sup> P12.01 = 115, homing mode 115

Homing in backward direction, and the negative limit switch as the deceleration point and the home position.

The present motor position is in the non-effective zone of the negative limit switch. When homing starts, the negative limit switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then ,homing is processed in the forward direction at a low speed, and stops when the motor reaches the falling edge of the negative limit switch.



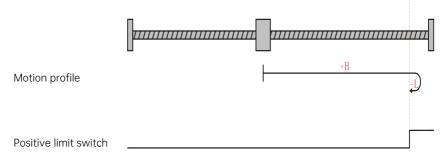
The present motor position is in the effective zone of the negative limit switch. When homing starts, the negative limit switch is at a high level, and homing is processed in the forward direction at a low speed. Homing stops when the motor reaches the falling edge of the negative limit switch.



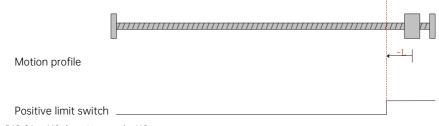
26) P12.01 = 118, homing mode 118

Homing in forward direction, and the positive limit switch as the deceleration point and the home position.

The present motor position is in the non-effective zone of the positive limit switch. When homing starts, the positive limit switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the falling edge of the positive limit switch.



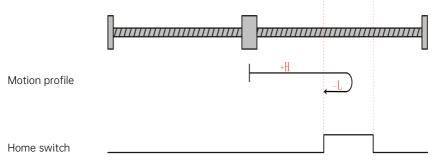
The present motor position is in the effective zone of the positive limit switch. When homing starts, the positive limit switch is at a high level, and homing is processed in the backward direction at a low speed. Homing stops when the motor reaches the falling edge of the positive limit switch.



## 27) P12.01 = 119, homing mode 119

Homing in forward direction, and the home switch as the deceleration point and the home position.

The present motor position is in the non-effective zone of the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



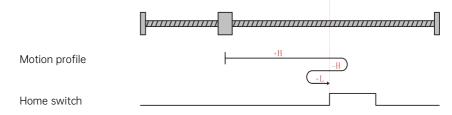
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a low speed. Homing stops when the motor reaches the falling edge of the home switch.

Motion profile	← <u>-</u> L	
Home switch	 	

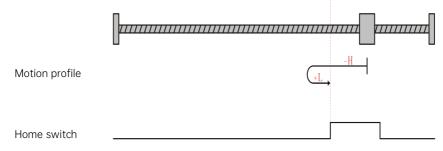
28) P12.01 = 120, homing mode 120

Homing in forward direction, and the home switch as the deceleration point and the home position.

The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



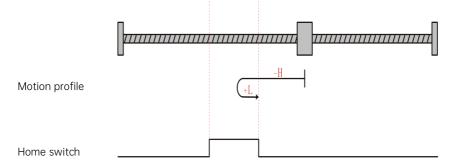
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a low level, and stops when the motor reaches the rising edge of the home switch.



29) P12.01 = 121, homing mode 121

Homing in backward direction, and the home switch as the deceleration point and the home position.

The present motor position is in the non-effective zone of the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a low speed. Homing stops when the motor reaches the falling edge of the home switch.

	-		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Motion profile	<u>  +L</u> →	*	
Home switch		]	

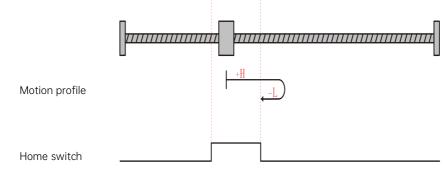
## 30) P12.01 = 122, homing mode 122

Homing in backward direction, and the home switch as the deceleration point and the home position.

The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.

	[ <del></del>	
Motion profile		
Home switch		

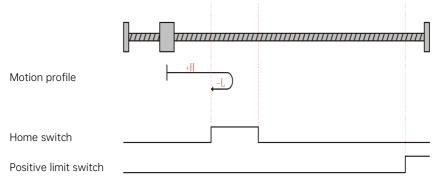
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



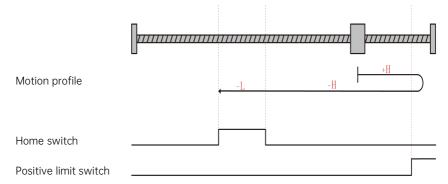
31) P12.01 = 123, homing mode 123

Homing in forward direction, and the home switch as the deceleration point and the home position.

The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the backward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



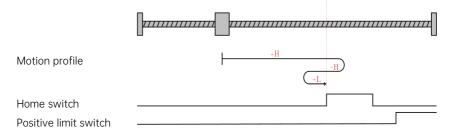
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a low speed. Homing stops when the motor reaches the falling edge of the home switch.

	 	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	///////////////////////////////////////	 77777
Motion profile	<u>← -L</u>			
Home switch				 
Positive limit switch	 			

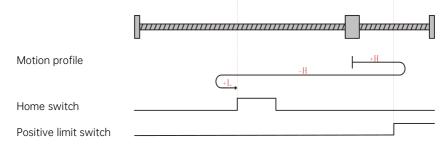
32) P12.01 = 124, homing mode 124

Homing in forward direction, and the home switch as the deceleration point and the home position.

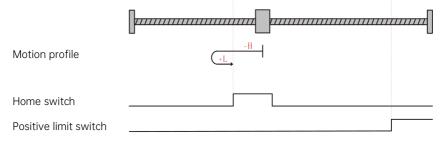
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



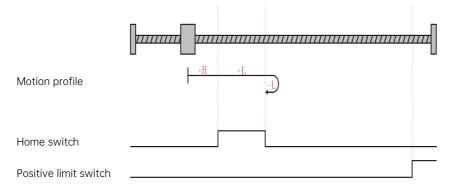
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



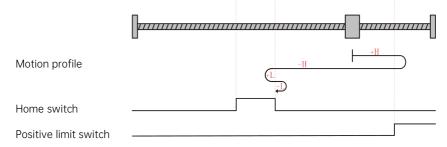
33) P12.01 = 125, homing mode 125

Homing in forward direction, and the home switch as the deceleration point and the home position.

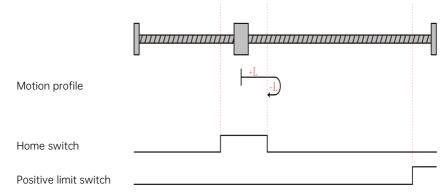
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the forward direction at a low speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed till it reaches the falling edge of the home switch. Following that, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



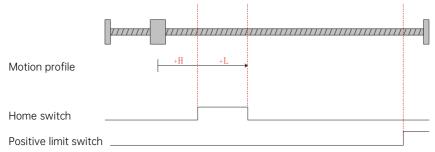
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a low speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



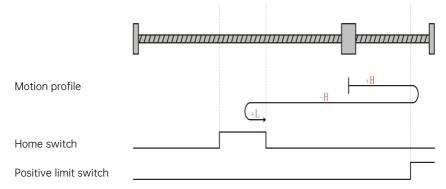
34) P12.01 = 126, homing mode 126

Homing in forward direction, and the home switch as the deceleration point and the home position.

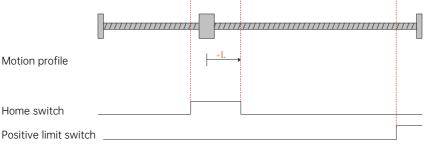
The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the forward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the forward direction at a high speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



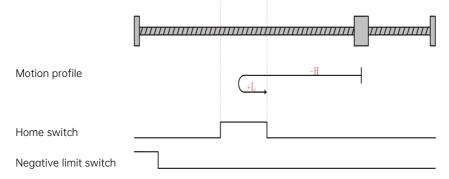
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a low speed. Homing stops when the motor reaches the falling edge of the home switch.



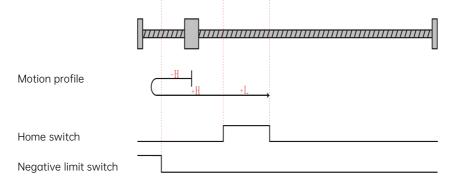
<sup>35)</sup> P12.01 = 127, homing mode 127

Homing in backward direction, and the home switch as the deceleration point and the home position.

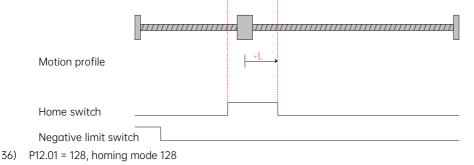
The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing continues in the forward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.

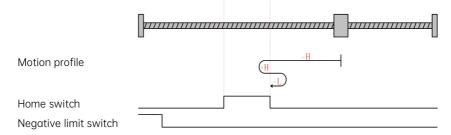


The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a low speed. Homing stops when the motor reaches the falling edge of the home switch.

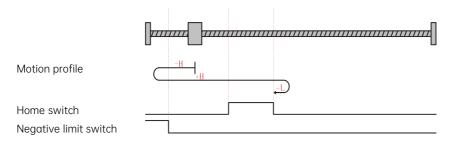


Homing in backward direction, and the home switch as the deceleration point and the home position.

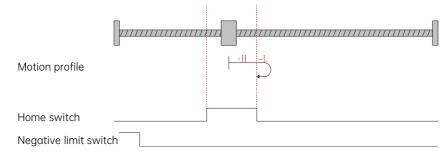
The present motor position is between the home switch and the positive limit switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of t he home switch.



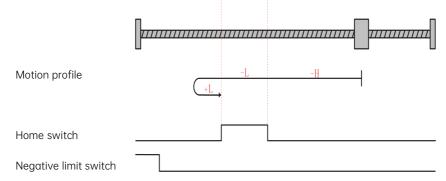
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the forward direction at a high speed till it reaches the falling edge of the home switch. Then, homing is processed in the backward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



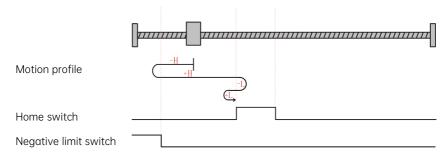
37) P12.01 = 129, homing mode 129

Homing in backward direction, and the home switch as the deceleration point and the home position.

The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the home switch. Then, homing continues in the backward direction at a low speed till it reaches the falling edge of the home switch. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed till it reaches the falling edge of the home switch. Following that, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.



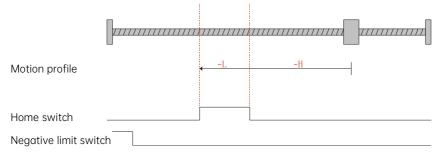
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a low speed till it reaches the falling edge of the home switch. Then, homing is processed in the forward direction at a low speed, and stops when the motor reaches the rising edge of the home switch.

Motion profile	
Home switch	
Negative limit swit	ch

38) P12.01 = 130, homing mode 130

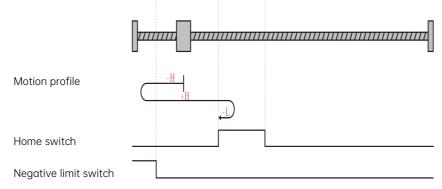
Homing in backward direction, and the home switch as the deceleration point and the home position.

The present motor position is between the positive limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward direction at a high level till it reaches the rising edge of the home switch. Then, homing continues in the backward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.

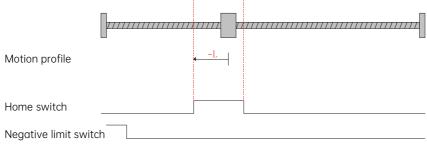


The present motor position is between the negative limit switch and the home switch. When homing starts, the home switch is at a low level, and homing is processed in the backward

direction at a high speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a high speed till it reaches the rising edge of the home switch. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the falling edge of the home switch.



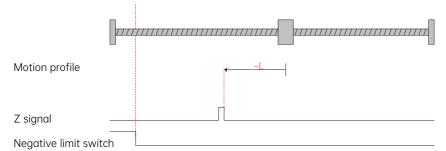
The present motor position is in the effective zone of the home switch. When homing starts, the home switch is at a high level, and homing is processed in the backward direction at a low speed. Homing stops when the motor reaches the falling edge of the home switch.



39) P12.01 = 133, homing mode 133

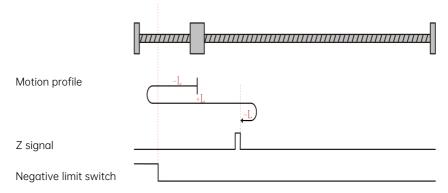
Homing in backward direction, and the motor Z signal as the deceleration point and the home position.

When there is at least one Z signal between the present motor position and the negative limit switch, homing will be processed in the backward direction at a low speed, and stop when the motor reaches the rising edge of the Z signal.



When the present motor position is at the Z signal, the homing enable will be triggered. The present position will be recognized as the home position immediately, and homing stops.

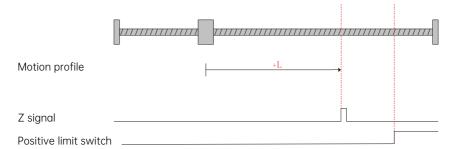
When there is no Z signal between the present motor position and the negative limit switch, homing will be processed in the backward direction at a low speed till it reaches the rising edge of the negative limit switch. Then, homing is processed in the forward direction at a low speed till it reaches the falling edge of the Z signal. Afterwards, homing is processed in the backward direction at a low speed, and stops when the motor reaches the Z signal.



40) P12.01 = 134, homing mode 134

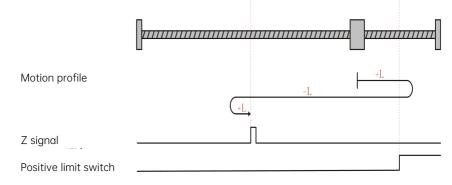
Homing in forward direction, and the motor Z signal as the deceleration point and the home position.

When there is as least one Z signal between the present motor position and the positive limit switch, homing will be processed in the forward direction at a low speed, and stop when the motor reaches the rising edge of the Z signal.



When the present motor position is at the Z signal, the homing enable will be triggered. The present position will be recognized as the home position immediately, and homing stops.

When there is no Z signal between the present motor position and the positive limit switch, homing will be processed in the forward direction at a low speed till it reaches the rising edge of the positive limit switch. Then, homing is processed in the backward direction at a low speed till it reaches the falling edge of the Z signal. Afterwards, homing is processed in the forward direction at a low speed, and stops when the motor reaches the Z signal.



41) P12.01 = 135, homing mode 135

The present motor position will be recognized as the home position, which is the same with the mode "Direct setting of home position."

# 7.10.6 Home position direct setting (Set reference point; Mode 5)

- 1. Select the running mode ModePos =5;
- 2. Set the drive running command EnableAxis = 1;
- 3. The positioning motion is triggered by the rising edge of ExecuteMode;

# 7.10.7 Traversing block (Mode 6)

Properly set the control words of the program segments based on actual operation conditions.

BIT15 BIT14 BIT13 BIT12 BIT11 BIT10 BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0
---

BIT0

0: Positioning. 1: Fixed torque

BIT1

1: Jump effective. 0: Jump ineffective

BIT2

1: Cycle effective. 0: Cycle ineffective

BIT4 to BIT7

Number of cycles in the segment

BIT8 to BIT12

The next jump segment (0 to 31)

## BIT15

0: Absolute position. 1: Relative position

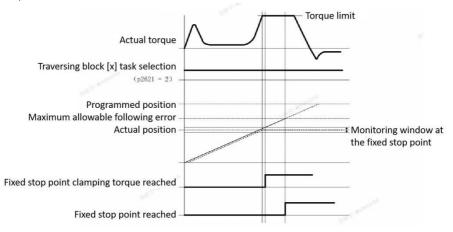
## 7.10.7.1 Positioning mode

- 1. Select the running mode ModePos =6;
- 2. Set the drive running command EnableAxis = 1;
- 3. Set the percentage of speed, acceleration, and deceleration via the input parameters OverV, OverAcc, and OverDec; it is required to set the running conditions CancelTraversing and IntermediateStop to 1, and set Jog1 and Jog2 to 0;
- 4. The number of the program segment is set by the input parameter "Position", which ranges from 0 to 31;
- 5. The positioning motion is triggered by the rising edge of ExecuteMode;
- 6. When the target position is reached, set AxisPosOk to 1.

## 7.10.7.2 Fixed stop point mode

When implementing the fixed endstop function using the Telegram 111, the endstop becomes effective and is moved to the fixed stop point at a set speed. It reaches the fixed stop point within the following error after the torque limit is reached. In case of excessive position deviation or when the fixed endstop is not found, an alarm will be reported. Properly set P17.12 (Fixed endstop clamping torque), P17.13

(Maximum following error of the fixed endstop), and P17.14 (Fixed endstop monitoring window) based on actual operation.



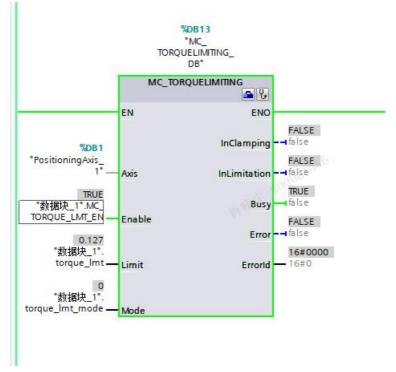
## 7.10.8 Jog (Velocity-dependent; Mode 7)

- 1. Select the running mode ModePos =7;
- 2. Set the drive running command EnableAxis = 1;
- 3. The jogging direction is determined by Jog1 and Jog2, and the jogging speed is set via P06.06;
- 4. When the target position is reached, set AxisPosOk to 1.

# 7.11 Torque control and torque limit

# 7.11.1 Torque limit via Siemens Telegrams 102 and 105

MEMRED in the Siemens Telegram 102/105 sets the torque limit via the function block MC\_Torquelimiting. MEMRED refers to the torque reduction value, where 0x4000 corresponds to 300% of the torque reduction value. When Limit is set to 0.127 and the torque limit is set to 10%, MEMRED = (3.81-0.127)\*0x4000/3.81 = 15838.



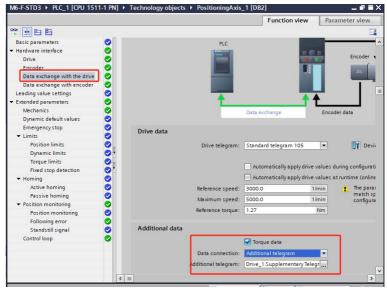
 $\ensuremath{\mathsf{MC}}\xspace_{\ensuremath{\mathsf{Torque}}\xspace}$  and  $\ensuremath{\mathsf{MC}}\xspace_{\ensuremath{\mathsf{Torque}}\xspace}$  and the effective simultaneously.

# 7.11.2 Torque control and torque limit via the Additional Telegram 750

Configure the parameter of the function code: P17.02 = 750. Configure the Additional Telegram 750 in PLC.

M6-F > PN-IO Drive_1 Parameter Access Point SIEMENS Telegram 105, PZD-10/10		0 0 0	0 0 X1			MEGMEET DRIVE M	MEG
Drive_1 Parameter Access Point							
Parameter Access Point		0				M6-F	
			1			Drive	
SIEMENIS Telegram 105 PZD-10/10		0	11			Parameter Access P	
Siements relegion 105,120-10/10		0	12	019	019	SIEMENS Telegram	
Supplementary Telegram 750, PZD-3		0	13	2021	2025	Supplementary Tel	
		0	2				
	-						
	, PZD-3/1 [Supplementary Telegra						

Tick the box and select the additional telegram "Technology objects".



Select "On load side" for the torque limit effective value.

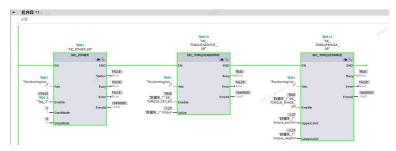
	Function view Parameter view
Basic parameters	> Torque limits
Hardware interface	> Torque limits
Drive	Operating for torque limiting
Encoder	
Data exchange with the drive	The limit values are in effect when values <0
Data exchange with encoder	are set at the Motion Control instructions
Leading value settings	o for the "Limit" parameter.
Extended parameters	The limit values are in effect when values <0 are set at the Motion Control instructions for the "Limit" parameter. Effective: On load side
Dynamic default values	
Emergency stop	
Position limits	
Dynamic limits	
Torque limits	
Fixed stop detection	⊘!
✓ Homing	
Active homing	
Passive homing	
<ul> <li>Position monitoring</li> </ul>	Position-related monitoring
Position monitoring	
Following error	
Standstill signal	Position-related monitoring     Behavior with enabled position-related monitoring (positioning monitoring/following error monitorin     and effective force/torque limiting or torque range
Control loop	one checkie lotenoique innoing of corque range
	<ul> <li>Disable position-related monitoring</li> </ul>
	O Leave position-related monitoring enabled
	< III >

Enable the STW1.14 switchover of torque control modes using the function block OB95.

ct Edit View Insert Online Op B 🛃 Saveproject 🎿 💥 🗐 🕞 :	🗙 🐂 🛨 (🕫 🗄 🔛 🔛 🔛 🖉 🕼 🍠 Go online 🖉 Go online 🌆 🖪 🖪 🛪 🔚 🛄 🛛 Search in projector 👍	Totally Integrated Automation PORT
	II	EX Instructions
Devices		Options
8	· [] 과 생성독학 에 드릴 글 20월 5월 5월 5월 1월 10일 60일 68월 64일 일 61일 61일 61일 61일	G895 MH MT *
	Block interface	> Favorites
M6-F-STD3		Basic instructions
Add new device		Name Vers
📥 Devices & networks	Block title:	Figeneral Vers.
PLC_1 [CPU 1511-1 PN]	Consect	General     General     General     General     General     General     General     V1.0
Device configuration	CONTRACT IN CONTRACT OF CONTRACT.	B Timer operations V1.0
S Online & diagnostics	Network 1:	Imer operations V1.0     In Counter operations V1.0
Software units	Comment	Comparator operations
<ul> <li>Rrogram blocks</li> </ul>	in the second seco	Comparator operations     Math functions     VI.0
Add new block		Move operations V2.5
Main [081]		Conversion operations
AC-interpolator (OB92)		<
MC-PostServo [OB95]		> Extended instructions
MC-Servo [OB91]		V Technology
<ul> <li>Technology objects</li> </ul>		
Add new object		Vers  Counting, measurement, V43
<ul> <li>Positioning/vis_1 [D82]</li> </ul>		<ul> <li>Counting, measurement</li></ul>
Configuration		HD Control     Motion Control     V5.0
Commissioning		SINAMCS Motion Control     V2.0
S Diagnostics		
🕨 📴 Output cam		Ime-based IO V2.0
Measuring input		
SpeedAvis_1 [D81]		
Configuration		
Commissioning		
Details view		
	100%	
Name Address	MC-PostServo (0895) S Properties Diagnostics	
	General Texts	
	General	
	Information General	
	Time stamps	> Communication
	Compilation Name: MCPostServo	Optional packages

Control the torque reference and the torque limit via MC\_TorqueAdditive and MC\_TorqueRange.

The torque reference refers to the maximum motor torque (P01.05). The maximum torque 3.81 N·m corresponds to the M\_ADDI value of 0x4000 in the telegram. The torque reference 1.27 N·m corresponds to the value of M ADDI = 1.27\*0x4000/3.81 = 5461.



When enabled, the motor runs at a speed = 6000 (Maximum speed threshold P06.09) \* 10.0% (FWD speed limit P07.10) = 600 rpm

When using the control word STW1.14 to switch the torque, before switching from the torque mode to the position mode, it is required to disable the servo enable via MC\_Power. Otherwise, the servo will run to position, which is set before the switchover, at the maximum speed.

# 7.11.3 Torque limit via the Siemens Telegram 111

The Siemens Telegram 111 enables the reading/writing of the torque limit, the 16-bit function code parameters, and the PNU parameters via the user receive word and the user send word.

When P17.08 (User receive word) is set to 1, it functions the same as the torque limit MEMRED. The value of 0x4000 corresponds to 300% of the torque reduction value. When Limit is set to 0.127 and the torque limit is set to 10%, MEMRED = (3.81-0.127)\*0x4000/3.81 = 15838.

When the value of P17.08 is between 900 and 999, the parameter is used to write the PNU parameters. P17.08 = PNU parameter number.

When the value of P17.08 is between 10000 and 40000, the parameter is used to write the function code parameters. P17.08 = 10000 + Menu number \* 100 + Parameter number.

When P17.09 (User send word) is set to 1, the present torque 0x4000 corresponds to 300% rated torque value.

When P17.09 (User send word) is set to 2, the present current 0x4000 corresponds to 100% rated current value.

When P17.09 (User send word) is set to 3, it refers to Di input.

When the value of P17.09 is between 900 and 999, the parameter is used to read the PNU parameters. P17.09 = PNU parameter number.

When the value of P17.09 is between 10000 and 40000, the parameter is used to read the function code parameters. P17.09 = 10000 + Menu number \* 100 + Parameter number.

### 7.12 Non-cyclic parameters reading/writing

The PLC adopts two methods for the non-cyclic reading/writing of the M6-F function code parameters and the PNU parameters: function block SINA\_PARA\_S (FB287) and function block WRREC/RDREC.

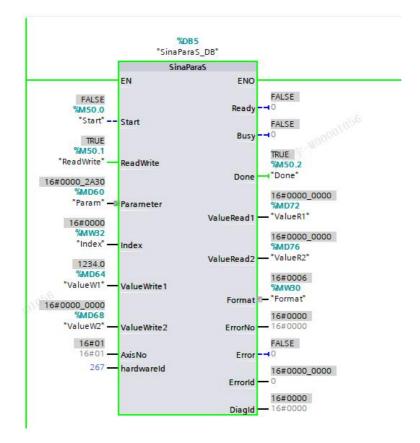
The corresponding number of the function code parameter = 10000 +Menu number \* 100 +Parameter number. For example, the corresponding number of the function code parameter P08.01 is 10801, and the indexes of the function code parameters are all 0.

#### 7.12.1 Read/Write parameters via the function block SINA\_PARA\_S (FB287)

Only the reading/writing of a single parameter is supported by FB287. The default value of AxisNO is 1, and hardwareld refers to the hardware identifier of the M6-F.

1.

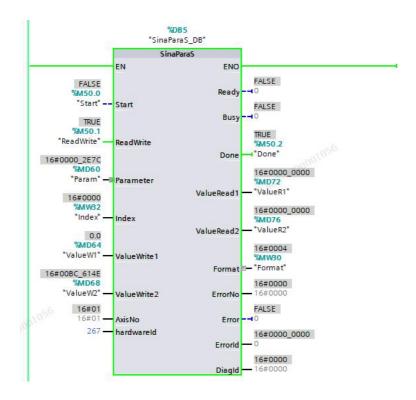
Writing of the 16-bit parameter P08.00 ReadWrite = 1 Parameter = 10800 Index = 0 AxisNo = 1 ValueWrite1 = 1234 Start = 1 Check the host device: P08.00 = 123.4



2.

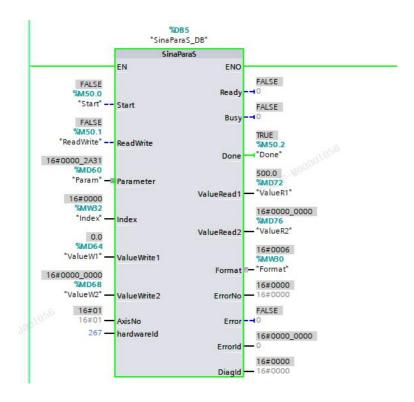
Writing of the 32-bit parameter P19.00 ReadWrite = 1 Parameter = 11900 Index = 0 AxisNo = 1 ValueWrite2 = 12345678 Start = 1

Check the host device: P19.00 = 12345678



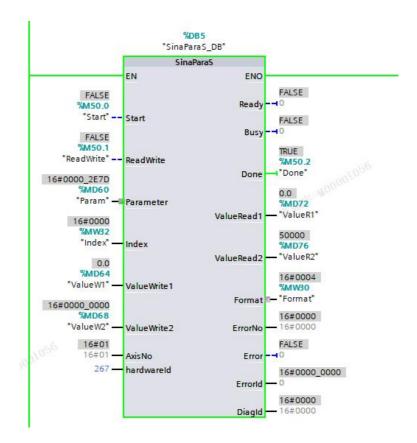
3.

Reading of the 16-bit parameter P08.01 Check the host device: P08.00 = 5.00 ReadWrite = 0 Parameter = 10801 Index = 0 AxisNo = 1 Start = 1 ValueRead1 = 500



4.

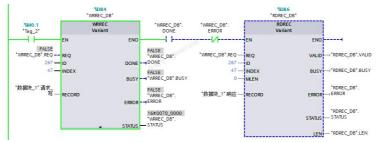
Reading of the 32-bit parameter P19.01 Check the host device: P19.01 = 50000 ReadWrite = 1 Parameter = 11901 Index = 0 AxisNo = 1 Start = 1 ValueRead2 = 50000



#### 7.12.2 Read/Write parameters via the function blocks WRREC and RDREC

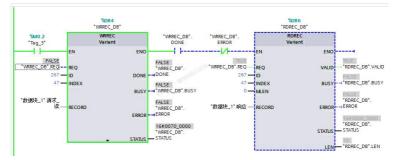
Call the function blocks WRREC and RDREC in OB1. The index is fixed at 47. ID refers to the hardware identifier of the M6-F.

Write P04.01=1.00 in accordance with the profile format.



	•	Request_write	Struct	
-		Request Reference	Byte	16#1
-		Request ID	Byte	16#2
		Axis	Byte	16#1
-		No. of Parameters	Byte	16#1
-		Attribute	Byte	16#10
-		No. of Elements	Byte	16#1
-		Param Num	Int	10401
-		Subindex	Int	0
-		format	Byte	16#6
		No. of values	Byte	16#1
		Value	Int	100

Read P20.03 = C0A8010A in accordance with the profile format.



•	Request_read	Struct		
	Request Reference	Byte	16#1	16#01
	Request ID	Byte 🔳	16#1	16#01
	Axis	Byte	16#1	16#01
	No. of Parameters	Byte	16#1	16#01
	Attribute	Byte	16#10	16#10
	No. of Elements	Byte	16#1	16#01
	Param Num	Int	12003	12003
	Subindex	Int	0	0
•	Response	Struct		
	Response Reference	Byte	16#0	16#01
•	Response ID	Byte	16#0	16#01
	Axis	Byte	16#0	16#01
	No. of Parameters	Byte	16#0	16#01
	format	Byte	16#0	16#07
	No. of values	Byte	16#0	16#01
	Value	DWord	16#0	16#C0A8_010A

# Chapter 8 Fault Diagnosis and Removal

The alarms are defined and categorized by PROFIdrive.

Number	Туре	Description	Fault code (P10.18)
1	Hardware/Software fault	A fault occurs with the hardware or software.	16, 25
2	A fault occurs with the main power supply, Main power supply fault which results in phase loss, overvoltage, or undervoltage.		6, 20, 29
3	Control power supply fault	A fault occurs with the control power supply.	3, 80
4	DC bus overvoltage	The voltage of the DC bus exceeds the threshold value.	2
5	Power electronic component fault	A fault occurs with the power electronic component, which results in overheat, overcurrent, or phase loss due to IGBT failure.	1, 10
6	Electronic component overheat	The electronic component temperature exceeds the threshold value.	8
7	-	Grounding or inter-phase short circuits are found in the power cable or the motor winding.	46
8	Motor overload	The motor operates beyond the limit of temperature, current, or torque.	11, 12
9	Host controller communication fault	A fault occurs with the PROFINET communication between the drive and the controller.	36
10	Safety operation monitoring channel fault	A fault is detected via the safety operation monitoring.	
11	Position feedback interface fault	A status error or signal loss occurs during the encoder signal processing.	19, 30, 31, 41, 71, 75, 76, 77, 78, 79
12	Internal communication fault	Abnormality or interruption occurs with the communication between the internal components of the drive.	13, 56
13	Power module fault	A fault or malfunction occurs with the power module.	

Number	Туре	Description	Fault code (P10.18)
14	Braking module fault	The internal or external braking module is abnormal, overloaded, or overheated.	9
15	Power supply filter fault The temperature of the power filter is too high or its state is abnormal.		
16	External signal fault	The external input signal exceeds the threshold value or an abnormal state occurs.	43
17	Application or technology function fault	The monitored position, speed, or torque of the drive exceeds the set threshold value.	27, 32, 34, 57, 58
18	Parameter setting/configuration fault	An error occurs with the setting/configuration of the drive parameters.	18, 22, 35, 55, 61, 70, 72
19	Common drive fault	A fault occurs with the device component.	4, 7, 37, 39, 40, 66, 73
20	Auxiliary device fault	An abnormal situation occurs with the monitoring of the auxiliary device.	

All possible fault types, fault causes, and solutions for the M6-F series are summarized as shown in table 8-1.

Fault code	Fault type	Cause	Confirmation method	Solution
		The motor cables are in poor contact. The motor cables are grounded. Short circuit occurs between	Check whether the cable connector is loose. Check the insulation resistance between the UVW and the grounding cable of the motor. Check whether the motor	Reliably fasten the cable connector. Replace the motor if the insulation is poor. Connect the motor cables
Er.001	Drive overcurrent	the motor UVW phases.	UVW interphase short circuit occurs. Check whether the	correctly.
		The motor is burned out and damaged.		Replace the motor if the resistances are unbalanced.
		The gain setting is improper and the motor oscillates.	Check whether the motor oscillates or generates abnormal noise, or check the running graphs.	Re-adjust the gain.

Fault code	Fault type	Cause	Confirmation method	Solution
		The encoder is incorrectly wired, its cables are aged and corroded, or the connection becomes loose.	Check whether the encoder wiring is correct, whether the cables are aged, and whether the connection is reliable.	Re-weld or fasten the encoder cables.
		The main circuit input voltage exceeds the specified range.	Measure the input power line voltage range.	Adjust the input power voltage according to the specifications.
		The braking resistor fails.	Measure the resistance between P and PB.	If the resistor is open, replace the external braking resistor.
Er.002	Drive main circuit overvoltage	The resistance of the external braking resistor does not match (the resistance is too large, resulting in the insufficiency of the energy absorption during braking.	Confirm the resistance of the braking resistor.	Select braking resistors with proper resistance according to the operation conditions and the load.
		The motor is in the full acceleration/deceleration	Check the deceleration ramp time during running, and monitor the bus voltage P11.09.	Increase the acceleration/deceleration time within the allowed range.
Er.003	Drive control power overvoltage	The control power voltage exceeds the input voltage range.	Measure the control power line voltage range.	Adjust the control power voltage according to the specifications.
		Output UVW phase loss or incorrect phase sequence occurs.	Perform noload motor trial running, and check the motor wiring.	Re-wire correctly, and replace the cables.
Er.004	Motor locked rotor occurs.	UVW output disconnection occurs.	Check the UVW wiring.	Re-wire correctly, and replace the cables.
		The locked rotor is caused by mechanical factors.	Check the running command and the motor speed.	Check and remove the mechanical factors that cause the locked rotor.
Er.006	Input side phase loss	Phase loss occurs in input L1, L2, or L3.	Check the input wiring and the input power.	If the input power is single-phase 220 V, set P10.00 to 1; if the input power is three-phase 220V, check whether phase loss occurs in the input power, and replace the cables if needed.
Er.007	Output side phase loss	Phase loss occurs in output UVW.	Check the output wiring, the motor, and the cables.	Replace the wiring cables.

Fault code	Fault type	Cause	Confirmation method	Solution
Er.008	Drive overheat	Ambient temperature is excessively high.	Check the cooling conditions around the drive.	Improve the servo drive cooling conditions, and reduce the ambient temperature.
		Overload operation for excessive times	Check whether any overload fault is reported in the fault record.	To reset, wait for 60 s after overload occurs; increase the capacity of the drive and motor; increase the acceleration/deceleration time; reduce the load.
		The fan is damaged.	Check whether the fan is running during drive operation.	Replace the fan.
		The external braking resistor is in poor wiring, its connection is loose, or the cables are disconnected.	Check whether the braking resistor is reliably wired.	Re-wire the external braking resistor according to the correct wiring diagram.
Er.009	Braking resistor overload	The jumper wire across the power terminals P and PB is disconnected when the internal braking resistor is used.	Check whether the jumper wire across the power terminals is reliably connected.	Correctly and reliably connect the jumper wire.
		Insufficient capacity of the servo drive or the braking resistor	Calculate the maximum braking energy.	Increase the braking resistor capacity; increase the servo drive capacity; increase the acceleration/deceleration time.
		The load's moment of inertia is beyond the range of the allowable moment of inertia.	Check the value of the load's moment of inertia.	Increase the capacity of the drive, motor, and the resistor.
		Interphase short circuit or short circuit to ground occurs in the output three phases.	Check the insulation of the cable and the output motor.	Replace the cable or the motor.
		Instantaneous overcurrent of the drive	See overcurrent solutions.	See overcurrent solutions.
Er.010	Power module protection	The auxiliary power supply is damaged; the drive voltage is insufficient.	Seek technical assistance.	Seek technical assistance.
		Inverter shoot-through	Seek technical assistance.	Seek technical assistance.
		Abnormal control board	Seek technical assistance.	Seek technical assistance.
		Brake pipe is damaged.	Seek technical	Seek technical assistance.

Fault code	Fault type	Cause	Confirmation method	Solution
			assistance.	
		Incorrect wiring of the motor and the encoder	Check whether the wiring is correct according to the correct wiring diagram.	Re-wire according to the correct wiring diagram; replace the cables.
		The load is excessively heavy, and the motor keeps outputting effective torque higher than the rated value for a long time.	Check the overload characteristics and the running commands of the motor or drive.	Increase the capacity of the drive and motor; reduce the load; increase the acceleration/deceleration time.
Er.011	Er.011: Servo drive overload	The acceleration/deceleration is excessively frequent, or the load inertia is excessively large.	Check the inertia ratio and the start-stop cycle.	Increase the acceleration/deceleration time.
Er.012	Er.012: Motor overload	The gain adjustment is improper; there is excessive rigidity; the motor vibrates; the sound is abnormal.	Check whether the motor vibrates and whether the sound is abnormal during motor running.	Re-adjust the gain.
		The servo drive or motor model is set incorrectly.	Check the setting of the motor model.	Correctly set the motor model.
		Overload during running resulted from locked rotor which is caused by mechanical factors	Check the running commands and the motor speed via the commissioning platform or the panel display.	Remove the mechanical factors causing the locked rotor.
		Note: To clear the fault or power or fault.	n again, wait for 60 s after	the occurrence of the overload
Er.013	EEPROM read/write fault	Parameter read/write error	Check whether an instantaneous power failure occurs during parameter writing.	Restore to the default setting (P02.22=2), and reset the parameter.
		The number of times of parameter writing within a certain amount of time exceeds the maximum.	Check whether the host device frequently modifies the parameters.	Change the parameter writing method and write again.
Er.014	Abnormal communication	Improper setting of communication parameters The communication wiring is	Check the function code settings. Check whether the	Correctly set the baud rate and the communication data format. Wire the communication cables
	of serial port	incorrect, or the cable is	communication wiring is	again, or replace the

Fault code	Fault type	Cause	Confirmation method	Solution
		unreliably connected or disconnected.	correct and whether the connection is reliable.	communication cables.
		Improper setting of fault parameters.	Check whether the setting of P15.02 is excessively short.	Correctly set P15.02.
		The host device does not work.	Check the signal of the host system.	Check whether the host device is working.
Er.015	Resistance of the external braking resistor is excessively small.	The resistance of the external braking resistor is smaller than the minimum value required by the servo drive.	Measure the resistance and check with function code P02.20	A braking resistor of which the resistance meets the requirement shall be applied; change the setting of the function code P02.20.
Er.016	The current detection circuit is	The cable connection or the plug-in unit of the control board is loose.	Check whether the cable connection or the plug-in unit of the control board is loose.	Check the wiring, and re-wire.
	abnormal.	Analog input (Al) overvoltage	Check whether the Al voltage exceeds 12 V.	Adjust the Al voltage.
	Poor auto-tuning	The motor parameter setting is incorrect.	Check the parameters on the motor nameplate.	Correctly set the motor parameters.
Er.018		Reverse rotating auto-tuning is performed when reverse running is prohibited.	Check whether the reverse running prohibit function is enabled.	Disable the reverse running prohibit function.
		Incorrect wiring of motor	Check the motor wiring.	Make sure the power line UVW is properly connected, and the sequence is correct.
		Encoder type error	Check the setting of the encoder type.	Correctly set the encoder type parameter.
Er.019	Encoder fault	Encoder disconnection	Check the encoder cables.	Replace the encoder cables.
Er.020	Undervoltage during main	Voltage drop of the power grid	Measure the voltage and check whether the voltage of the input grid power is abnormal.	Improve the input of grid power.
	circuit operation	Overload, or mismatching between the motor and the drive	Check the load and whether the drive and motor match.	Select the appropriate drive and motor.
Er.021	Al function conflict	The same AI channel is set to different functions.	Check the setting of the Al channel parameters.	Make sure the Al functions properly to avoid conflict.
Er.022	Incorrect setting of	Parameter auto-tuning in the non-VC control mode		Make sure the control mode parameters are correctly set.

Fault code	Fault type	Cause	Confirmation method	Solution
	control mode parameters		parameters.	
	Abnormal Al	Al channel overvoltage	Measure the Al channel voltage.	Adjust the input voltage, and make sure the value does not exceed 12 V.
Er.024	input	Incorrect wiring of the Al channel	Check the wiring in accordance with the correct wiring diagram.	Re-wire.
5.005	Temperature sampling	The temperature sampling circuit is abnormal.		Seek technical assistance.
Er.025	disconnection protection	The temperature sensor or signal cable is abnormal.		Seek technical assistance.
		The initial angle of the	Check the initial angle of	Perform the encoder angle
		encoder is incorrect.	the encoder P01.22.	auto-tuning again.
Er.027	Servo motor overspeed	The actual speed of the servo motor exceeds the overspeed threshold.	Check whether the overspeed threshold is set appropriately. (The overspeed threshold is set via P10.12; when P10.12 is set to 0, the overspeed threshold is 1.2 times of the motor maximum speed; when P10.12 is set to a non-0 value, the overspeed threshold is the minimum between P10.12 and the value of 1.2 times of the motor maximum speed)	Correctly set the overspeed threshold.
		Incorrect UVW phase sequence of the motor wiring	Check the wiring of the servo motor.	Make sure the motor wiring is correct.
		The input reference value exceeds the overspeed range.	Check the input reference.	Decrease the value of the reference, or adjust the gain.
		The motor speed overshoots.	Check the waveform of the motor speed.	Decrease the regulator gain; adjust the servo gain, or adjust the operating conditions.
		Servo drive fault	Check whether the fault is reported again when the system is powered	Replace the servo drive.

Fault code	Fault type	Cause	Confirmation method	Solution
			off and powered on again.	
Er.031	Encoder multi-turn count overflow	The multi-turn count exceeds 65535.	Check whether the value of P11.33 exceeds the maximum number of encoder turns.	Operate the motor in the speed mode to make the multi-turn count avoid the overflow judgement value 65535; shield the multi-turn overflow fault.
Er.032	Excessive position deviation	The position deviation exceeds the set value of P05.21.	Check whether the position deviation detection range P05.21 is excessively small, or whether the position gain P08.02 is excessively small.	Increase the position loop gain P08.02.
Er.033	Abnormal pulse input	The pulse frequency exceeds the set value of P10.13.	Check whether the maximum position pulse frequency P10.13 is excessively small.	Reset P10.13 according to the maximum position pulse frequency needed for normal mechanical running. If the output pulse frequency of the host device exceeds 4 MHz, it is necessary to reduce the output pulse frequency of the host device.
Er.034	Fully-closed loop position deviation is excessively large.	The position deviation of the external encoder and the internal encoder is excessively large.	Check whether the setting of P13.01 external encoder pulses per motor revolution is correct, and whether P13.04 the increase in threshold of excessive fully-closed loop position deviation judgement is excessively small.	Increase the threshold of excessive fully-closed loop position deviation judgement P13.04.
Er.035	Fully-closed loop function parameters setting error	In the fully-closed loop position mode, the source of position command is the internal position command. However, the internal/external loop switchover mode is applied.	Check whether P13.03 is set to 2, and whether the source of position command is the internal position command (Multi-segment position command, and interrupt positioning).	Use the external encoder feedback mode only (i.e. set P13.03 to 1 only) when the fully-closed loop function is applied and the source of position command is the internal position command.

Fault code	Fault type	Cause	Confirmation method	Solution
Er.036	PN bus communication is interrupted.	Communication interruption timeout between controller and servo	Check the connection between controller and servo.	Connect the cables again, or set appropriate disconnection detection time P17.07 according to the communication cycle.
Er.037	Homing timeout	After homing is enabled, the home position is not located within the time set by P12.09.	Check the settings of the homing mode and the homing timeout detection time P12.09.	Properly set the homing timeout detection time according to the homing motion profile.
Er.039	Positive over-travel	The motor exceeds the positive limit switch during running.	Check whether the mechanical device comes in contact with the limit switch.	Reverse the motor running to detach the device from the limit switch.
Er.040	Negative over-travel	The motor exceeds the negative limit switch during running.	Check whether the mechanical device comes in contact with the limit switch.	Reverse the motor running to detach the device from the limit switch.
Er.043	External fault	Action of the external fault terminal	Check whether the fault terminal is triggered by mistake.	Check the external wiring.
		The power output cables (UVW) of the drive are short circuited to ground.	Disconnect the UVW cables on the motor side, and check whether the power cables are short circuited to ground.	Re-wire, or replace the cables.
Er.046	Short circuit to ground upon power-on	The motor is short circuited to ground.	Disconnect the UVW cables on the motor side, and check whether the motor internal power cables are short circuited to the motor grounding wire.	Replace the motor.
Er.047 Er.048 Er.049	Internal logic error			Seek technical assistance.
Er.050	ASIC initialization error	Abnormal ASIC communication	Restart the drive.	Restart the drive; if the fault can not be reset, replace the drive.
Er.053	The position reference command of the controller is	The position reference command of the controller is excessively large.	Check the position reference command of the controller.	Reduce the deviation of the position reference command of the controller.

Fault code	Fault type	Cause	Confirmation method	Solution
	excessively large.			
Er.055	PN telegram configuration error	Mismatch between P17.01/P17.02 and the PLC program telegram configuration	Check the function code and the PLC telegram configuration.	Make sure the telegrams match.
Er.056	200P communication disconnection	The communication between 200P and MCU is interrupted.	Re-start the drive.	Re-start the drive; if the fault can not be reset, replace the drive.
Er.057	Fixed stop point beyond the monitoring window	When the fixed stop point is reached, the axis is beyond the monitoring window P17.14.	Check the axis position.	Check whether the endstop position is loose; adjust the monitoring window P17.14.
Er.058	The fixed stop point is not reached.	The fixed stop point is not located after the present position segment is performed.	Check the axis position.	Check the endstop position; check whether the setting of the segment position is excessively small.
Er.059	Running error after the fixed stop point is reached	After the fixed stop point is reached, the next segment is not directed to leave the stop point.	Check the axis running direction.	Check the axis running direction after the fixed stop point is reached.
Er.061	Electronic gear ratio setting error	Electronic gear ratio setting error	Check whether the electronic gear ratio parameter is set appropriately.	Correctly set the electronic gear ratio parameter.
Er.065	ASIC EEPROM is not burned.	ASIC EEPROM is not burned by the controller.	The controller burns the EEPROM according to the description file.	If the fault can not be reset, the controller needs to burn the EEPROM according to the description file.
Er.066	Homing logic error	The homing parameters are set improperly, or homing command is executed during positioning.	Check whether the homing parameters, including the home position search acceleration/deceleration time, and the homing method, are set correctly.	Properly set the homing parameters according to the actual homing method, or perform homing after the completion of positioning.
Er.070	The setting of matching motor number is invalid or incorrect.	The set motor number is invalid.	Check with the correct motor number, and reset.	Correctly set the motor number parameter P01.00.

Fault code	Fault type	Cause	Confirmation method	Solution
Er.071	Incremental encoder UVW position error	The UVW position of the incremental encoder is invalid.	Check whether the motor end and the servo end of the encoder cable are reversed. Re-plug the encoder terminals, power on multiple times repeatedly, and observe whether the fault still exists.	Swap the plugs of the encoder cable (the servo end is marked with the cable label), check the encoder wiring, or replace the encoder.
Er.072	Program burning error	The software program is inconsistent with the hardware.	Check whether the hardware model matches the software model.	Seek technical assistance.
Er.073	Bootstrapping failure	When enabling the 220 V drive, the motor speed is excessively high (exceeding 100 rpm).	Check whether the motor is rotating before enabling the drive.	Enable the drive when the motor is static or its speed is lower than 100 rpm.
Er.075	Absolute encoder battery undervoltage	The absolute encoder battery voltage is lower than 3.1 V when the drive is powered on.	Check whether the battery voltage is lower than 3.1 V.	Replace the encoder cable or encoder battery.
Er.076	Absolute encoder battery disconnection	The absolute encoder battery is disconnected, or the battery voltage is lower than 2.75 V during drive power failure.	Check whether the encoder battery is disconnected during drive power failure; check whether the battery voltage is excessively low.	If Er.076 is reported after the drive is powered on for the first time, press the reset button to clear the fault. If the fault remains after several times of resetting, replace the encoder cable or battery.
Er.077	Incorrect setting of encoder type	The actual encoder type is inconsistent with that read by P01.00.	Check whether the required encoder type of P01.00 is consistent with the actual encoder type.	Confirm the motor model, and modify the value of P01.00 if necessary.
Er.078	No parameter stored in the absolute encoder EEPROM	There is no parameter in the absolute encoder EEPROM when P01.00 is reading EEPROM.	Check whether any parameter has been written into the absolute encoder EEPROM.	Seek technical assistance.
Er.079	Absolute encoder EEPROM	Error occurs when writing parameters into the absolute encoder EEPROM.	Check whether parameters can be re-written after	Check the encoder type; replace the encoder or the motor if necessary.

Fault code	Fault type	Cause	Confirmation method	Solution
	parameter write error		power-off and power-on again.	
Er.080	Control circuit undervoltage	Control circuit power failure or undervoltage; USB power only.	whether the value is within the required	Check the power wiring, and replace the control circuit power supply if necessary.

Possible alarm types, causes, and solutions of the M6-F series are summarized as shown in table 8-2.

Tabel 8-2 Alarm code table

Alarm code	Alarm type	Cause	Confirmation method	Solution
		Incorrect wiring of motor or encoder	Check the wiring according to the correct wiring diagram.	Properly re-wire according to the correct wiring diagram; replace the cables.
		The motor outputs effective torque exceeding the rated value for an extended period, which is resulted from excessive overload.	Check the overload characteristics and the running commands of the motor or drive.	Increase the capacity of the drive and the motor; reduce the load; increase the acceleration/deceleration time.
AL.012		Acceleration/Deceleration is excessively frequent, or the load inertia is excessively large.	Check the inertia ratio and the start/stop cycle.	Increase the acceleration/deceleration time.
			The gain adjustment is inappropriate; there is excessive rigidity; the motor vibrates and generates abnormal sound.	Check whether the motor vibrates and generates abnormal sound during running.
		Incorrect setting of the drive/motor model	Check the setting of the motor model.	Correctly set the motor model.
		Overload during running resulted from locked rotor which is caused by mechanical factors	Check the running commands and the motor speed via the commissioning platform or the panel	Remove the mechanical factors causing the locked rotor.

Alarm code	Alarm type	Cause	Confirmation method	Solution
			display.	
		Incorrect setting of the communication parameters	Check the function code setting.	Correctly set the baud rate and the communication data format.
AL.014	Serial port communication	The communication cable is wired incorrectly, or the connection is unreliable or disconnected.	Check whether the communication cable is wired/connected correctly and reliably.	Re-connect the communication cable, or replace the communication cable.
	abnormality	Incorrect setting of the alarm parameters	Check whether the set value of P15.02 is too short.	Correctly set P15.02.
		The host device is not working.	Check whether the host device signal is normal.	Check whether the host device is working normally.
		Al channel overvoltage	Check the Al channel input voltage.	Adjust the input voltage, and make sure the value does not exceeds 12 V.
AL.024	Abnormal Al input	Al channel wiring error	Check the wiring in accordance with the correct wiring diagram.	Re-wire.
	Temperature sampling	The temperature sampling circuit is abnormal.		Seek technical assistance.
AL.025	disconnection protection	The temperature sensor or signal cable is abnormal.		Seek technical assistance.
AL.038	DI emergency brake alarm	Action by emergency brake terminal	Set P02.09 to 1 to enable the emergency brake. An alarm will be reported upon any action by the emergency brake terminal when the drive is in the running state.	Set the reference according to normal logic.
AL.039	Positive over-travel alarm	The drive position exceeds the positive limit switch when P10.04 is set to 0 or 1.	Check whether the DI terminal is set to function 35 in group P03. Check the DI terminal logic validity of the bit corresponding to the	Check the running mode. Under the premise of safety, make the terminal logic of the positive limit switch invalid by implementing a reverse command or rotating the motor.

Alarm code	Alarm type	Cause	Confirmation method	Solution
			input signal monitoring P11.12.	
AL.040	Negative over-travel alarm	The drive position exceeds the negative limit switch when P10.04 is set to 0 or 1.	Check whether the DI terminal is set to function 36 in group P03. Check the DI terminal logic validity of the bit corresponding to the input signal monitoring P11.12.	Check the running mode. Under the premise of safety, make the terminal logic of the negative limit switch invalid by implementing a reverse command or rotating the motor.
AL.062	Interrupt positioning alarm	The interrupt positioning is enabled during zero-speed running.	Check the servo running state.	Perform the interrupt positioning in non-zero speed state.
AL.075	Absolute encoder battery undervoltage	The absolute encoder battery voltage is lower than 3.1 V when the drive is powered on.	When operation is enabled, an alarm of LOW is reported. When not enabled, AL.075 is reported; measure the battery voltage and check whether it is lower than 3.1 V.	Replace the encoder cable or battery.

## Chapter 9 Parameter Table

The drive parameter indexes of the M6-F drive models are explained below

Parameter group	Index	Remark
P00	100XX	Drive parameter index = (10000 + Group number * 100 +
P01	101XX	Parameter number); [Example]:
		Parameter P00.00 in group P00:
		Index = 10000;
		Parameter P12.10 in group P12:
		Index = 11210;

Drive parameters are listed below.

Index	Name	Range	Min. unit	Default	Effective time	Property	
	P00: Drive parameters						
10000	Series number	0 to FFFF	1	Manufacturer setting	-	At display	
10001	DSP software version number	0.00 to 99.99	0.01	Manufacturer setting	-	At display	
10002	Customized version number	0 to 9999	1	Manufacturer setting	-	At display	
10003	FPGA software version number	0.00 to 99.99	0.01	Manufacturer setting	-	At display	
10004	Servo drive voltage class	0: 220 V 1: 380 V	1	Manufacturer setting	-	At display	
10005	Servo drive rated current	0 to 999.9 A	0.1 A	Manufacturer setting	-	At display	
10006	Servo drive maximum current	0 to 999.9 A	0.1 A	Manufacturer setting	-	At display	
		P01: Motor para	meters				
10100	Motor number	0: Motor parameter can be set; 0x0001 to 0xFFFF: Motor parameter is set automatically based on motor number;	1	0	Immediate	At stop	
10101	Rated power	0.04 to 99.99 kW	0.01 kW	Depend on model	Power-on again	At stop	

Index	Name	Range	Min. unit	Default	Effective time	Property
10102	Rated voltage	0 to "Servo drive rated voltage"	1 V	0	Power-on again	At stop
10103	Rated current	0.1 to 999.9 A	0.1 A	Depend on model	Power-on again	At stop
10104	Rated torque	0.1 to 655.35 N ⋅ m	0.01 N·m	Depend on model	Power-on again	At stop
10105	Maximum torque	0.1 to 655.35 N ⋅ m	0.01 N∙m	Depend on model	Power-on again	At stop
10106	Rated rotating speed	0.1 to 6000.0 rpm	0.1 rpm	Depend on model	Power-on again	At stop
10107	Maximum rotating speed	0.1 to 6000.0 rpm	0.1 rpm	Depend on model	Power-on again	At stop
10108	Rotor inertia Jm	0.001 to 65.535 kg*cm <sup>2</sup>	0.01 kg*cm <sup>2</sup>	Depend on model	Power-on again	At stop
10109	Number of pole pairs	2 to 72 pole pairs	1 pole pair	Depend on model	Power-on again	At stop
10110	Stator Resistance R1	0.000 to 65.000 Ω	0.001 Ω	Depend on model	Power-on again	At stop
10111	Direct axis inductance Ld	0.00 to 200.00 mH	0.01 mH	Depend on model	Power-on again	At stop
10112	Q-axis Inductance Lq	0.00 to 200.00 mH	0.01 mH	Depend on model	Power-on again	At stop
10113	Back EMF constant	1 to 600.0 V/krpm	0.1 V/krpm	Depend on model	Power-on again	At stop
10114	Torque coefficient Kt	0.001 to 65.000 N⋅m/A	0.01 N·m/A	Depend on model	Power-on again	At stop
10115	Electrical constant Te	0.01 to 650.00 ms	0.01 ms	Depend on model	Power-on again	At stop
10116	Mechanical constant Tm	0.01 to 650.00 ms	0.01 ms	Depend on model	Power-on again	At stop
10117	Brake function	0: Without brake 1: With brake	1	Depend on model	Immediate	At stop
10118	Encoder selection	<ol> <li>Reserved</li> <li>Tamagawa serial intelligent 23-bit absolute encoder</li> <li>Line-saving incremental encoder (with UVW)</li> <li>Reserved</li> <li>Full line incremental encoder</li> <li>Reagle Sensing 17-bit</li> </ol>	1	1	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
		absolute encoder				
		(Reserved)				
		6: Nikon 20-bit absolute				
		encoder (Reserved)				
	N	7: Reserved				
10119	Number of encoder lines	1 to 4194304	1	2097152	Immediate	At stop
	Initial angle tuning	0: No action				
10120	during encoder	1: Action (Static motor)	1	0	Immediate	At stop
	installation	2: Action (Rotating motor)				
10121	Rotation direction	0: A ahead of B	1	0	Immediate	At stop
10121		1: B ahead of A	I	0	Innediate	ALSTOP
10122	Initial angle of encoder installation	0.0 to 359.9°	0.1°	180.0	Immediate	At stop
10123	Initial angle of encoder Z pulse	0.0 to 359.9°	0.1°	180.0	Immediate	At stop
		P02: Basic control p	arameters			
		0: Speed mode				
		1: Position mode				
		2: Torque mode				
		3: Speed mode ←→ position				
		mode (switchover via				
		function 9)				
		4: Torque mode ←→ position				
		mode (switchover via				
		function 9)				
		5: Speed mode ←→ torque				
		mode (switchover via				
10200	Control mode	function 9)	1	0	lanan aliata	A + - +
10200	selection	6: Speed mode ←→ torque	1	0	Immediate	At stop
		mode $\leftarrow \rightarrow$ position				
		mode(torque switchover				
		via function 9; position				
		switchover via function 10;				
		no switchover when				
		function 9 and 10 are both				
		valid or invalid, and the				
		system stays in speed				
		mode under the				
		circumstances)				
		7: CANopen mode				

Index	Name	Range	Min. unit	Default	Effective time	Property
		8: EtherCAT mode 9: MECHATROLINK-III mode 10: PROFINET mode				
10201	Internal servo enable	0 to 1	1	0	Immediate	During running
10202	Absolute system mode selection	0: Absolute position linear mode 1: Absolute position rotation mode	1	0	Immediate	At stop
10203	Rotation direction selection	<ul> <li>0: CCW direction as the forward direction (A ahead of B)</li> <li>1: CW direction as the forward direction (reverse mode; A after B)</li> </ul>	1	0	Immediate	During running
10204	Encoder frequency-division output pulses	1 to 32768 P/r	1	2500 P/r	Immediate	During running
10205	Pulse output source selection	0: Motor encoder frequency-division output 1: Pulse command synchronous output 2: Frequency-division or synchronous output prohibit	1	2	Immediate	During running
10206	Output pulse direction selection	0: A ahead of B 1: A after B	1	0	Immediate	During running
10207	Z pulse output polarity selection	0: Positive output (Z pulse at a high level) 1: Negative output (Z pulse at a low level)	1	0	Immediate	During
10208	Stop mode	0: Decelerate to stop 1: Coast to stop	1	0	Immediate	During running
10209	Emergency stop enable	<ul> <li>0: No operation; remain in the present running state</li> <li>1: Enable the emergency stop; stop based on the set stop mode (P02.08); report an alarm Al.038</li> </ul>	1	0	Immediate	During
10210	Delay from the brake output being	20 to 500 ms	1 ms	250	Immediate	During running

switched to ON to the command inputImage: Solution of the command inputIm	Index	Name	Range	Min. unit	Default	Effective time	Property
Delay from the brake output being switched to OFF to the motor's entry into the non-powered state1 to 1000 ms1 ms1 ms150ImmediateDuring running10212Brake command output speed limit value0 to 3000.0 rpm1 rpm10.0ImmediateDuring running10213Delay from the servo enable being switched to OFF to the brake output being switched to OFF1 to 30000 ms1 ms500ImmediateDuring running10214Minimum energy consumption resistor allowed by the drive1 to 30000 ms1 ms500ImmediateDuring running10215Minimum energy consumption resistor resistor ecofficient-1Depend on modelAt display10216Built-in energy consumption resistor resistor ecofficient0.0% 1: 25%12ImmediateDuring running10217Resistor head dissipation resistor icoefficient0.0% 1: 25%12ImmediateAt display10218Energy consumption resistor selection0.0% 1: 25%12ImmediateAt display10218Energy consumption resistor resistor selection0.0% 1: Use external energy consumption resistor 2: Energy consumption resistor not used10ImmediateAt stop		switched to ON to					
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10217     dissipation     2: 50%     1     2     Immediate     During running       10217     coefficient     3: 75%     1     2     Immediate     running       4: 100%     0: Use built-in energy consumption resistor     0: Use built-in energy consumption resistor     1     0     Immediate     At stop       10218     Energy consumption resistor selection     1: Use external energy consumption resistor     1     0     Immediate     At stop       10218     Energy consumption resistor resistor not used     1     0     Immediate     At stop							
coefficient     3: 75%     running       4: 100%     0: Use built-in energy consumption resistor     0: Use built-in energy consumption resistor     1       10218     Energy consumption resistor selection     1: Use external energy consumption resistor     1     0     Immediate     At stop       10218     Energy consumption resistor selection     1: Use external energy consumption resistor     1     0     Immediate     At stop	10017						During
10218     Energy consumption resistor selection     0: Use built-in energy consumption resistor     1     0     Immediate     At stop       10218     Energy consumption resistor selection     1: Use external energy consumption resistor     1     0     Immediate     At stop	10217			1	2	Immediate	running
10218     Energy consumption resistor selection     0: Use built-in energy consumption resistor     1     0     Immediate     At stop       10218     Energy consumption resistor selection     1: Use external energy consumption resistor     1     0     Immediate     At stop		coefficient					
10218     Energy consumption resistor selection     I: Use external energy consumption resistor     1     0     Immediate     At stop       10218     Energy consumption resistor selection     I: Use external energy consumption resistor     1     0     Immediate     At stop							
10218       Energy consumption resistor selection       1: Use external energy consumption resistor       1       0       Immediate       At stop         10218       2: Energy consumption resistor       1       0       Immediate       At stop							
10218     resistor selection     consumption resistor     1     0     Immediate     At stop       2: Energy consumption resistor not used		Enorgy consumption					
2: Energy consumption resistor not used	10218			1	0	Immediate	At stop
resistor not used							
		Extornal operation					
10219 consumption resistor 1 to 65535 W 1 W Immediate At stop	10219		1 to 65535 W	1 \\/	Depend on	Immediato	Atistop
power model	10217			1 VV	model		AL SLOP
	10220	External energy	1 to 65535 Ω	1Ω	Depend on	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
	consumption resistor			model		
	resistance					
10221	Parameter protection setting	<ul> <li>O: Modification available for all data;</li> <li>1: Modification prohibited except for this function code and P06.01;</li> <li>2: Modification prohibited except for this function code;</li> </ul>	1	0	Immediate	During running
10222	Parameter initialization	0: State of parameter modification 1: Clear fault memory information 2: Restore to default value	1	0	Immediate	At stop
10223	LED display parameter selection	0: Switch to display P11.00 1: Switch to display P11.01 2: Switch to display P11.02 3: Switch to display P11.03 4: Switch to display P11.04 5: Switch to display P11.05 	1	0	Immediate	During running
		P03: Digital input/output te	rminal parame	eters	•	
10300	DI1 terminal function selection		1	1	Immediate	At stop
10301	DI2 terminal function selection	2: External reset (RESET) input	1	2	Immediate	At stop
10302	DI3 terminal function selection	3: Gain switchover 4: Multi-speed DI switchover	1	5	Immediate	At stop
10303	DI4 terminal function selection	of running direction 5: Multi-segment running	1	6	Immediate	At stop
10304	Reserved	reference switchover 1	1	0	Immediate	At stop
10305	Reserved	6: Multi-segment running reference switchover 2	1	0	Immediate	At stop
10306	Reserved	7: Multi-segment running	1	0	Immediate	At stop
10307	Reserved	reference switchover 3	1	0	Immediate	At stop
10308	Reserved	8: Multi-segment running	1	0	Immediate	At stop
10309	Reserved	reference switchover 4 9: Control mode switchover 1 10: Control mode switchover 2	1	0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
		11: Zero servo enable terminal				
		12: Pulse input prohibit				
		13: FWD rotation prohibit				
		14: REV rotation prohibit				
		15: Electronic gear ratio				
		switchover 1				
		16: Electronic gear ratio				
		switchover 2				
		17: FWD jog				
		18: REV jog				
		19: External torque limit				
		during FWD rotation				
		20: External torque limit				
		during REV rotation				
		21: Multi-segment position				
		reference 1				
		23: Multi-segment position				
		reference 2				
		23: Multi-segment position				
		reference 3				
		24: Multi-segment position				
		reference 4				
		25: Multi-segment position				
		reference 5				
		26: Speed command direction				
		switchover				
		27: Torque command				
		direction switchover				
		28: Multi-segment /				
		Signal-point position				
		command enable				
		29: Position deviation counter				
		clear				
		30: Interrupt positioning state				
		release				
		31: Interrupt positioning				
		prohibit				
		32: Home switch				
		33: Homing enable				
		34: Emergency stop				
		35: Positive limit switch				

Index	Name	Range	Min. unit	Default	Effective time	Property
		<ul> <li>36: Negative limit switch</li> <li>37: Main/Auxiliary speed</li> <li>reference switchover</li> <li>38: External fault input</li> <li>20: External fault input</li> </ul>				
		39: External terminal 1 input 40: External terminal 2 input				
10310	Terminal (DI1 to DI8) filter time	1 to 500 ms	1 ms	10	Immediate	During running
10311	Terminal (DI9/DI10) filter time	0 to 127(Filter time = Set value x 100 ns)	100 ns	50	Immediate	During running
10312	DI enable terminal validity type selection	<ul> <li>0: The enable terminal is effective based on level;</li> <li>1: The enable terminal is effective based on edge jump;</li> </ul>	1	1	Immediate	During running
10313	Status of enabled input terminal	Binary setting 0: Normal logic, positive logic active 1: logical negation, negative logic active LED ones place BIT0 to BIT3: DI1 to DI4 LED tens place BIT0 to BIT3: DI5 to DI8 LED hundreds place BIT0 to BIT1: DI9 to DI10	1	000	Immediate	During running
10314	Virtual input terminal setting	Binary setting 0: Disabled 1: Enabled LED ones place BIT0 to BIT3: DI1 to Dl4 LED tens place BIT0 to BIT3: DI5 to Dl8 LED hundreds place BIT0 to BIT1: DI9 to Dl10	1	000	Immediate	During running
10315	DO1 function	0: Servo drive ready (RDY)	1	0	Immediate	At stop
10315	selection DO2 function	1: Servo drive running signal (RUN)	1	1	Immediate	At stop At stop
10317	selection DO3 function selection	2: Consistent speed 3: Speed arrival signal 4: Zero-speed operation	1	3	Immediate	At stop

10318       Reserved       5: Drive fault       1       11       Immediate       At stop         10519       Reserved       6: Drive alarm       1       5       Immediate       At stop         10519       Reserved       7: Host device switch signal       1       5       Immediate       At stop         10219       Reserved       8: Torque limiting       9: Speed limiting       1       5       Immediate       At stop         10: Zero servo completed       10: Zero servo completed       11: Positioning completed       1       6       Immediate       At stop         10: Zero servo completed       12: Position proximity       13: Alarm of position       exceeding tolerance       14: Homing       15: Homing completed       16: Electrical homing       completed       16: Electrical homing       17: Electrical homing       17: Electrical homing       10320       Reserved       18: Brake output (brake output signal)       19: Torque arrival signal       20: FWD/REV indication       1       6       Immediate       At stop         10320       Reserved       22: Position arrival 1       23: Position arrival 2       24: Position arrival 2       1       6       Immediate       At stop         10320       Reserved       22: Position arrival 3       25: Position arrival 4	Index	Name	Range	Min. unit	Default	Effective time	Property
10519       Reserved       7: Host device switch signal         8: Torque limiting       9: Speed limiting         9: Speed limiting       10: Zero servo completed         11: Positioning completed       12: Position proximity         13: Alarm of position       exceeding tolerance         14: Homing       15: Homing completed         15: Homing completed       16: Electrical homing         16: Electrical homing       1         completed       18: Brake output (brake         10320       Reserved         18: Brake output (brake       1         0: EvVD/REV indication       1         19: Torque arrival signal       21: Reserved         21: Reserved       22: Position arrival 1         23: Position arrival 2       24: Position arrival 5         27: Interrupt positioning       5         ampleted       5         10: Evultation       1         10: Evultatis and thoming       1 <tr< td=""><td>10318</td><td>Reserved</td><td>5: Drive fault</td><td>1</td><td>11</td><td>Immediate</td><td>At stop</td></tr<>	10318	Reserved	5: Drive fault	1	11	Immediate	At stop
7: Host device switch signal         8: Torque limiting         9: Speed limiting         10: Zero servo completed         11: Positioning completed         12: Position proximity         13: Alarm of position         exceeding tolerance         14: Horning         15: Horning completed         16: Electrical homing         17: Electrical homing         completed         18: Brake output (brake         output signal)         19: Torque arrival signal         20: FWD/REV indication         terminal         21: Reserved         22: Position arrival 1         23: Position arrival 2         24: Position arrival 4         26: Position arrival 5         27: Interrupt positioning         completed         Binary setting	10319	Reserved	6: Drive alarm	1	5	Immediate	At stop
9: Speed limiting         10: Zero servo completed         11: Positioning completed         12: Position proximity         13: Alarm of position         exceeding tolerance         14: Homing         15: Homing completed         16: Electrical homing         17: Electrical homing         completed         18: Brake output (brake       1         00320       Reserved         18: Brake output (brake       1         20: FWD/REV indication         terminal         21: Reserved         22: Position arrival 1         23: Position arrival 2         24: Position arrival 3         25: Position arrival 4         26: Position arrival 5         27: Interrupt positioning         completed         Binary setting			7: Host device switch signal		-		
10: Zero servo completed         11: Positioning completed         12: Position proximity         13: Alarm of position         exceeding tolerance         14: Homing         15: Homing completed         16: Electrical homing         17: Electrical homing         completed         18: Brake output (brake       1         010320       Reserved         18: Brake output (brake       1         6       Immediate         At stop         output signal)         19: Torque arrival signal         20: FWD/REV indication         terminal         21: Reserved         22: Position arrival 1         23: Position arrival 2         24: Position arrival 3         25: Position arrival 4         26: Position arrival 5         27: Interrupt positioning         completed         Binary setting			8: Torque limiting				
11: Positioning completed         12: Position proximity         13: Alarm of position         exceeding tolerance         14: Homing         15: Homing completed         16: Electrical homing         17: Electrical homing         completed         18: Brake output (brake       1         0utput signal)         19: Torque arrival signal         20: FWD/REV indication         terminal         21: Reserved         22: Position arrival 1         23: Position arrival 2         24: Position arrival 3         25: Position arrival 4         26: Position arrival 5         27: Interrupt positioning         completed         Binary setting			9: Speed limiting				
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10321 enabled output LED ones place 1 00 Immediate	10321	-	LED ones place	1	00	Immediate	Ŭ
termingl BIT0 to BIT3: DO1 to DO4			BITO to BIT3: DO1 to DO4				running
LED tens place			LED tens place				
BITO to BIT1: DO5 to DO6							
P05: Position control parameters			•	parameters			
0: Pulse reference			0: Pulse reference				
1: Single-point position			1: Single-point position				
Position reference         1         0         Immediate         At stop	10500		reference	1	0	Immediate	At stop
mode 2: Multi-segment position		mode	2: Multi-segment position				
			reference				

Index	Name	Range	Min. unit	Default	Effective time	Property
10501	Pulse reference input terminal selection	0: Low-speed terminal 1: High-speed terminal	1	1	Immediate	At stop
10502	Pulse command mode	0: A/B phase pulse 1: Pulse + Sign 2: CW/CCW pulse	1	0	Immediate	At stop
10503	Pulse command logic	0: Positive logic 1: Negative logic	1	0	Immediate	At stop
10504	Reserved					
10505	Command pulses per motor revolution	0 to 8388608 P/r	1 P/r	10000	Immediate	At stop
10506	Position command first-order low-pass filter time	0.0 to 2000.0 ms	0.1 ms	0	Immediate	During running
10507	Position command movement average filter time	0.0 to 12.8 ms	0.1 ms	0	Immediate	During running
10508	Electronic gear numerator	1 to 1073741824	1	8388608	Immediate	At stop
10509	Electronic gear ratio denominator 1	1 to 1073741824	1	10000	Immediate	At stop
10510	Electronic gear ratio denominator 2	1 to 1073741824	1	10000	Immediate	At stop
10511	Electronic gear ratio denominator 3	1 to 1073741824	1	10000	Immediate	At stop
10512	Electronic gear ratio denominator 4	1 to 1073741824	1	10000	Immediate	At stop
10513	Electronic gear ratio switchover conditions	0: Switch when the position command is 0 and holds for 3 ms; 1: Real-time switchover;	1	0	Immediate	At stop
10514	Position deviation clear method selection	<ul> <li>0: Clear position deviation when servo enable is OFF or when servo is stopped;</li> <li>1: Clear position deviation when servo enable is OFF or a fault/alarm occurs;</li> <li>2: Clear position deviation when servo enable is OFF or the external position</li> </ul>	1	00	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
		deviation clear DI is valid.				
10515	Position deviation clear DI signal type	0: Pulse mode 1: Level mode	0	0	Immediate	At stop
10516	Speed feedforward control selection	<ul> <li>0: No speed feedforward;</li> <li>1: Internal speed feedforward (take the speed information corresponding to the position command in the encoder unit as the source of the speed feedforward signal);</li> <li>2: Al1 as the speed feedforward;</li> <li>3: Al2 as the speed feedforward;</li> </ul>	1	1	Immediate	At stop
10517	Position controller output limit	0 to "Maximum speed"	0.1 rpm	6000.0	Immediate	During running
10518	Output conditions for positioning completion	<ul> <li>0: The absolute value of position deviation is smaller than the amplitude of positioning completion;</li> <li>1: The absolute value of position deviation is smaller than the amplitude of positioning completion, and the command after the position command filtering is zero;</li> <li>2: The absolute value of position deviation is smaller than the amplitude of positioning completion, and the positioning completion, and the position command is zero;</li> </ul>	1	0	Immediate	At stop
10519	Positioning completion range	0 to 10000	1 command unit	10	Immediate	During running
10520	Position proximity signal width	1 to 32767	1 command unit	100	Immediate	During running
10521	Position error detection range	0 to 32767	1 encoder unit	20000	Immediate	During running

10522Position error alam invoild0: Enable t: Disable10Immediate prunning running10523Servo shutdown mode0: Switch to speed control on and stop occording to servo shutdown time; t: Switch to speed control on decelerate to stop111ImmediateDuring running10523Servo shutdown mode0: 0 3000 ms When PL (CCWL) or NL (CWL) occurs, decelerate to stop10ImmediateDuring running10524Mechanical gear ratio numerator in the obsolute position rotation mode10ImmediateAt stop10525Mechanical gear ratio denominator in the obsolute position rotation mode111ImmediateAt stop10526Mechanical gear ratio denominator in the obsolute position rotation mode1010ImmediateAt stop10527Mechanical gear ratio denominator in the obsolute position rotation mode100042949672951011MenediateAt stop10528Position offset in the absolute position rotation mode0000000101010111111111111111111111111111111111111111	Index	Name	Range	Min. unit	Default	Effective time	Property
InvalidI: DisableI: Disable	10522	Position error alarm	0: Enable	1	0	Immediate	During
10523Servo shutdown modeand stop according to servo shutdown time; 1: Witch to speed control and decelerate to stop11Immediate puring running10524Servo shutdown time0 to 3000 ms When PL (CCWL) or NL (CWL) occording to the shutdown time10ImmediateDuring puring10525Mechanical gear ratio numerator in the dosolute position ratio nomede165535111MenediateAt stop10526Mechanical gear ratio numerator in the dosolute position ratio mode165535111MenediateAt stop10527Mechanical gear ratio anome ratio mode165535111MenediateAt stop10528Position offset in the dosolute position linear mode (Lower 3 2 bits)165535111MenediateAt stop10529Position offset in the dosolute position incar mode (Lower 3 2 bits)0429496729511encoder unit0ImmediateAt stop10529Number of pulses the absolute position in the absol	10322	invalid				Ininediate	running
10523     Servo shutdown mode     servo shutdown tecelerate to stop     1     1     Immediate (acclerate to stop)     During running       10524     Servo shutdown time     0 to 3000 ms     Immediate     During running       10524     Servo shutdown time     0 to 3000 ms     Immediate     During running       10525     Servo shutdown time     When PL (CCWL) or NL (CWL) occurs, decelerate to stop according to the shutdown time     1     0     Immediate     During running       10526     Mechanical gear ratio numerator in the absolute position rotation mode     1     to 65535     1     1     Immediate     At stop       10527     Mechanical gear ratio denominator in the absolute position linear mode (Lower 32 bits)     1     to 65535     1     1     Immediate     At stop       10528     Position offset in the absolute position linear mode (Lower 32 bits)     0     0     4294967295     1     encoder unit     0     Immediate     At stop       10528     Position offset in the absolute position linear mode (Higher 32 bits)     0     0     0     0     0     4294967295     1     encoder unit     0     Immediate     At stop       10529     Position offset in the absolute position linear mode (Higher 22 bits)     0     0     0     0     0     0     0     At stop							
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per load revolution in the absolute position rotation mode (Lower 32 bits)0 to 42949672951 encoder unit0ImmediateAt stopNumber of pulses per load revolution in the absolute position (Higher 32 bits)Number of pulses 0 to 1271 encoder unit0ImmediateAt stop10530Number of pulses per load revolution in the absolute position (Higher 32 bits)0 to 1271 encoder unit0ImmediateAt stop10531Soft limit function setting0: Disable soft limit 1: Enable soft limit10ImmediateAt stop		32 bits)					
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10529       the absolute position 0 to 4294967295       0       Immediate       At stop         rotation mode (Lower 32 bits)       0       Immediate       At stop         Number of pulses per load revolution in 10530       Number of pulses per load revolution in the absolute position rotation mode (Higher 32 bits)       0       to 127       1 encoder unit       0       Immediate       At stop         10530       Soft limit function setting       0       to 127       1       0       Immediate       At stop		per load revolution in		1 encoder			
rotation mode (Lower 32 bits)       rotation mode (Lower 32 bits)       rotation mode       rotation       rotation <tdr< td=""><td>10529</td><td>the absolute position</td><td>0 to 4294967295</td><td></td><td>0</td><td>Immediate</td><td>At stop</td></tdr<>	10529	the absolute position	0 to 4294967295		0	Immediate	At stop
Number of pulses per load revolution in the absolute position rotation mode (Higher 32 bits)0 to 1271 encoder unit0ImmediateAt stop10531Soft limit function setting0: Disable soft limit 1: Enable soft limit10ImmediateAt stop				Gint			
per load revolution in the absolute position rotation mode (Higher 32 bits)0 to 1271 encoder unit0ImmediateAt stop10531Soft limit function setting0: Disable soft limit 1: Enable soft limit10ImmediateAt stop							
10530       the absolute position rotation mode (Higher 32 bits)       0 to 127       1 encoder unit       0       Immediate       At stop         10531       Soft limit function setting       0: Disable soft limit       1       0       Immediate       At stop							
rotation mode (Higher 32 bits)     unit       Soft limit function setting     0: Disable soft limit 1: Enable soft limit     1     0     Immediate     At stop	10570			1 encoder		lanan cattaria	A+
(Higher 32 bits)     0: Disable soft limit       10531     Soft limit function setting     0: Disable soft limit	10550		0 to 127	unit	0	Immediate	At stop
Soft limit function setting         0: Disable soft limit 1: Enable soft limit         1         0         Immediate         At stop							
Soft limit function     1: Enable soft limit     1     0     Immediate     At stop			0: Disable soft limit				
setting	10531			1	0	Immediate	At stop
		setting	immediately upon		-		

Index	Name	Range	Min. unit	Default	Effective time	Property
		power-on 2: Enable soft limit after homing				
10532	Software limit maximum point	-2147483647 to 2147483647	1 command unit	2147483647	Immediate	At stop
10533	Software limit minimum point	-2147483647 to 2147483647	1 command unit	-2147483648	Immediate	At stop
		P06: Speed control	parameters			
10600	Main reference source selection	<ul> <li>0: Digital reference (P06.01)</li> <li>1: Al1 analog reference</li> <li>2: Al2 analog reference</li> <li>3: Serial port communication reference</li> <li>4: Multi-speed reference (Auxiliary reference not available)</li> </ul>	1	0	Immediate	During running
10601	Main reference speed setting	-6000.0 to 6000.0 rpm	0.1 rpm	0.0	Immediate	During running
10602	Auxiliary speed source selection	0: No auxiliary reference 1: Digital reference 2: Al1 analog reference 3: Al2 analog reference 4: Serial port communication reference	1	0	Immediate	During running
10603	Auxiliary reference speed setting	-6000.0 to 6000.0 rpm	0.1 rpm	0	Immediate	During running
10604	Main/Auxiliary	0: Main + Auxiliary 1: Main - Auxiliary 2: Main/Auxiliary reference switchover via terminal 3: MAX (Main/Auxiliary reference) 4: MIN (Main/Auxiliary reference)	1	0	Immediate	During running
10605	Jog speed	0.0 to 6000.0 rpm	0.1 rpm	100.0	Immediate	At stop
10606	Jog operation					
10607	Speed command acceleration time 1	0 to 65535 ms	1 ms	1000	Immediate	During running
10608	Speed command deceleration time 1	0 to 65535 ms	1 ms	1000	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
10609	Maximum speed threshold	0.0 to 6000.0 rpm	0.1 rpm	6000.0	Immediate	During running
10610	Forward speed threshold	0.0 to 6000.0 rpm	0.1 rpm	6000.0	Immediate	During running
10611	Reverse speed threshold	0.0 to 6000.0 rpm	0.1 rpm	6000.0	Immediate	During running
10612	Positive torque limit channel	0: Internal positive torque limit value 1: Al1 reference 2: Al2 reference 3: External negative torque limit value	1	0	Immediate	At stop
10613	Negative torque limit channel	0: Internal negative torque limit value 1: Al1 reference 2: Al2 reference 3: External negative torque limit value	1	0	Immediate	At stop
10614	Internal positive torque limit value	0.0% to +400.0%	0.1%	Depend on model	Immediate	During running
10615	Internal negative torque limit value	0.0% to +400.0%	0.1%	Depend on model	Immediate	During running
10616	External positive torque limit value	0.0% to +400.0%	0.1%	100.0	Immediate	During running
10617	External negative torque limit value	0.0% to +400.0%	0.1%	100.0	Immediate	During running
10618	Torque feedforward control selection	0: No torque feedforward 1: Internal torque feedforward (take the speed command as the torque feedforward signal source. In the position control mode, the speed command comes from the output of the position controller)	1	1	Immediate	During running
10619	Zero clamp function	0: Disabled 1: Always enabled 2: Enabled under conditions (enabled via terminal)	1	0	Immediate	At stop
10620	Zero clamp gain	0 to 6.000	0.001	1.000	Immediate	During

Index	Name	Range	Min. unit	Default	Effective time	Property		
						running		
10621	Zero clamp starting speed	0.0 to 1000.0 rpm	0.1 rpm	2.0	Immediate	During running		
10622	Speed arrival detection width	0.0 to 5000.0 rpm	0.1 rpm	20.0	Immediate	During running		
10623	Zero speed threshold	0.0% to 100.0% of maximum speed	0.1%	1.0	Immediate	During running		
10624	Speed consistency threshold	0.0 to 100.0 rpm	0.1 rpm	10.0	Immediate	During running		
P07: Torque control parameters								
10700	Torque reference selection	0: Digital reference 1: Al1 reference 2: Al2 reference 3: Serial port reference	1	0	Immediate	At stop		
10701	Positive direction selection of torque	0: FWD drive as positive 1: REV drive as positive	1	0	Immediate	At stop		
10702	Speed/Torque switchover mode selection	0: Direct switchover 1: Switch over the torque switchover point	1	0	Immediate	At stop		
10703	Torque digital reference	-400.0% to +400.0%	0.1%	0.0	Immediate	During running		
10704	Torque reference acceleration / deceleration time	0 to 6553.5 ms	0.1 ms	0	Immediate	At stop		
10705	Torque command filter time constant	0 to 30.0 ms	0.1 ms	1.0	Immediate	At stop		
10706	Second torque command filter time constant	0 to 30.0 ms	0.1 ms	1.0	Immediate	At stop		
10707	Speed/Torque switchover point	0.0% to 400.0% of initial torque	0.1%	100.0	Immediate	At stop		
10708	Speed/Torque switchover delay	0 to 1000.0 ms	0.1 ms	0.0	Immediate	At stop		
10709	FWD speed limit channel	0: FWD speed limit value 1: Al1 reference 2: Al2 reference	1	0	Immediate	At stop		
10710	FWD speed limit value	0.0% to 100.0%	0.1%	100.0	Immediate	During running		
10711	REV speed limit channel	0: REV speed limit value 1: Al1 reference	1	0	Immediate	At stop		

Index	Name	Range	Min. unit	Default	Effective time	Property
		2: Al2 reference				
10712	REV speed limit value	0.0% to 100.0%	0.1%	100.0	Immediate	During running
10713	Torque arrival reference value	0.0 to 400.0%	0.1%	0.0	Immediate	During running
10714	Torque arrival effective value	0.0 to 400.0%	0.1%	20.0	Immediate	During running
10715	Torque arrival non-effective value	0.0 to 400.0%	0.1%	10.0	Immediate	During running
		P08: Gain para	meters			
10800	Speed loop proportional gain 1	0.1 to 5000.0 Hz	0.1 Hz	20.0	Immediate	During running
10801	Speed loop integral time 1	0.00 to 10.000 ms	0.01 ms	5.00	Immediate	During running
10802	Position loop gain 1	1 to 8000 rad/s	1 rad/s	18	Immediate	During running
10803	Speed regulator output filter time 1	0 to 32.0 ms	0.1 ms	0.8	Immediate	During running
10804	Speed loop proportional gain 2	0.1 to 5000.0 Hz	0.1 Hz	20.0	Immediate	During running
10805	Speed loop integral time 2	0.00 to 10.000 ms	0.01 ms	1.00	Immediate	During running
10806	Position loop gain 2	1 to 8000 rad/s	1 rad/s	60	Immediate	During running
10807	Speed regulator output filter time 2	0 to 32.0 ms	0.1 ms	0.8	Immediate	During running
10808	Gain selection mode	0: Gain 1 is fixed; P/PI switchover via external DI 1:Gain switchover based on condition selection of P08.09	0	0	Immediate	During running
10809	Gain switchover condition selection	<ul> <li>0: No switchover of gain 1</li> <li>1: Switchover via external DI terminal</li> <li>2: Torque command</li> <li>3: Speed command</li> <li>4: Feedback speed</li> <li>5: Speed command change rate</li> <li>6: Position deviation</li> </ul>	1	0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
		7: Speed command high/low speed threshold 8: Position command received				
		9: Positioning not completed 10: Position command received + actual speed				
10810	Gain switchover delay	0 to 1000 ms	1 ms	5	Immediate	During running
10811	Gain switchover level	0 to 20000	Switch on condition	50	Immediate	During running
10812	Gain switchover hysteresis	0 to 20000	Switch on condition	30	Immediate	During running
10813	Position gain switchover time	0 to 1000 ms	1 ms	5	Immediate	During running
10814	Speed feedforward filter time	0.00 to 64.00 ms	0.01 ms	0.05	Immediate	During running
10815	Speed feedforward gain	0.0 to 100.0%	0.01%	0.0	Immediate	During running
10816	Torque feedforward filter time	0.00 to 64.00 ms	0.01	0.05	Immediate	During running
10817	Torque feedforward gain	0.0 to 200.0%	0.1%	0.0	Immediate	During running
10818	Cut-off frequency of feedback speed low-pass filter (Encoder filter time at present)	100 to 4000 Hz (0.0 to 40.0)	0.0	40.0	Immediate	During running
10819	PDFF (Pseudo- differential feedforward) control coefficient (Reserved in non-torque control mode)	0.0 to 100.0%	0.1%	100.0	Immediate	During running
	1	P09: Adjustment p	arameters			
10900	Offline inertia identification function		0.01	0.00	Immediate	At stop
10901	Inertia identification	200 to 2000 rpm	1 rpm	800	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
	maximum speed					
10902	Inertia identification acceleration time	10 to 1000 ms	1 ms	60	Immediate	At stop
10903	Motor revolutions for inertia identification	0.00 to 2.00 r	0.01 r	0.00	Immediate	At stop
10904	Waiting time after single inertia identification	50 to 10000	1 ms	800	Immediate	At stop
10905	Online inertia identification mode	<ol> <li>Disabled</li> <li>Enabled; change slowly</li> <li>Enabled; change at normal speed</li> <li>Enabled; change quickly</li> </ol>	1	0	Immediate	At stop
10906	Gain adjustment mode	<ul> <li>Distributed, energy query</li> <li>O: Parameter auto-tuning is invalid; manual tuning is applied;</li> <li>Parameter auto-tuning mode; automatically adjust the gain parameters using the rigidity table;</li> <li>Positioning mode; automatically adjust the gain parameters using the rigidity table;</li> </ul>	1	0	Immediate	At stop
10907	Rigidity level	0 to 31	1	14	Immediate	At stop
10908	Adaptive notch filter mode	<ul> <li>0: The parameters of the 3rd and 4th notch filters are not updated;</li> <li>1: The adaptive results of the 3rd notch filter parameters are updated;</li> <li>2: The parameter adaptive results of the 3rd and 4th notch filters are updated;</li> <li>3: Automatically detect the mechanical resonance frequency, but do not set the relevant parameters of the notch filter;</li> <li>4: Restore the parameters of the 4 notch filters to</li> </ul>	1	0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
		default values;				
10909	Setting of sensitivity for automatic vibration suppression	1 to 100	1	1	Immediate	At stop
10910	Notch filter 1 frequency	0 to 4000 Hz	1 Hz	0	Immediate	At stop
10911	Notch filter 1 width	10 to 1000 Hz	1 Hz	100	Immediate	At stop
10912	Notch filter 2 frequency	0 to 4000 Hz	1 Hz	0	Immediate	At stop
10913	Notch filter 2 width	10 to 1000 Hz	1 Hz	100	Immediate	At stop
10914	Notch filter 3 frequency	0 to 4000 Hz	1 Hz	0	Immediate	At stop
10915	Notch filter 3 width	10 to 4000 Hz	1 Hz	100	Immediate	At stop
10916	Notch filter 4 frequency	0 to 4000 Hz	1 Hz	0	Immediate	At stop
10917	Notch filter 4 width	10 to 1000 Hz	1 Hz	100	Immediate	At stop
10918	Speed loop low-pass filter time-constant	0 to 65536 µs	1 µs	0	Immediate	At stop
10919	Speed reference notch filter frequency	0 to 1000 Hz	1 Hz	0	Immediate	At stop
10920	Speed reference notch filter width	10 to 500 Hz	1 Hz	100	Immediate	At stop
10921	Reserved					
10922	Resonance frequency identification result	0 to 2000 Hz	1 Hz	-	Immediate	At stop
10923	Disturbance torque compensation gain	0.0% to 100.0%	0.1%	0	Immediate	At stop
10924	Disturbance observer filter time	0.0 to 25.0 ms	0.1 ms	0	Immediate	At stop
10925	Low-frequency resonance suppression mode selection	0: Manually set vibration suppression parameters 1: Automatically set vibration suppression parameters	1	0	Immediate	During running
10926	Low-frequency resonance frequency	1.0 to 200.0 Hz	0.1 Hz	100.0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
10927	Low-frequency resonance frequency filter setting	0 to 20	1	0	Immediate	During running
10928	Low-frequency resonance position deviation judgment threshold	1 to 1000 P	1 P	5	Immediate	At stop
10929	Torque command offset (Vertical axis mode)	-300.00% to 300.00%	0.01%	0.00	Immediate	During running
10930	Viscous friction compensation gain	0 to 1000.0	0.1%/ 10000 rpm	0	Immediate	At stop
10931	Positive friction compensation	0 to 50.0%	0.1	0	Immediate	At stop
10932	Negative friction compensation	0 to 50.0%	0.1%	0	Immediate	At stop
10933	Quadrant protrusion positive direction compensation value	-100.00% to 100.00%	0.01%	0.00	Immediate	At stop
10934	Quadrant protrusion opposite direction compensation value	-100.00% to 100.00%	0.01%	0.00	Immediate	At stop
10935	Quadrant protrusion compensation delay	0 to 1000.0	0. 1 ms	0.0	Immediate	At stop
10936	Quadrant protrusion compensation filter	0 to 1000.0	0. 1 ms	0.0	Immediate	At stop
10937	Quadrant protrusion compensation effective position	0 to 65535	1	1	Immediate	At stop
10938	Load's moment of inertia ratio	0.00 to 120.00	0.01	1.00	Immediate	At stop
		P10: Fault and protection	on parameters	3		
11000	Action selection upon phase loss	<ul> <li>0: Activate protection upon input and output phase loss</li> <li>1: No protection upon input phase loss</li> <li>2: No protection upon output phase loss</li> </ul>	1	0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
		3: No protection upon input/output phase loss				
11001	Action selection upon communication timeout	0: Activate protection and coast to stop 1: Report an alarm and keep running	1	0	Immediate	During running
11002	Action selection upon temperature sampling disconnection	0: Activate protection and coast to stop 1: Report an alarm and keep running	1	0	Immediate	During running
11003	Action selection upon analog input fault	0: Activate protection and coast to stop 1: Report an alarm and keep running	1	0	Immediate	During running
11004	Over-travel stop mode selection	<ul> <li>O: Activate protection and coast to stop</li> <li>1: Report an alarm, decelerate to zero, and hold the state of position lock</li> </ul>	1	2	Immediate	During running
11005	Reserved					
11006	Motor overload protection action selection	0: Activate protection and coast to stop 1: Report an alarm and keep running	1	1	Immediate	At stop
11007	Motor overload protection gain	20.0% to 300.0%	0.1%	100.0	Immediate	During running
11008	Runaway protection enable (Reserved)	0: Disable 1: Enable	1	1	Immediate	At stop
11009	Locked rotor over-temperature protection enable	<ul> <li>0: Shield the detection for locked rotor over-temperature protection</li> <li>1: Enable the detection for locked rotor over-temperature protection</li> </ul>	1	0	Immediate	At stop
11010	Locked rotor over-temperature protection time window	10 to 65535 ms	1 ms	100	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
11011	Action selection for encoder multi-turn overflow fault	0: Not shield 1: Shield	1	0	Immediate	At stop
11012	Overspeed fault threshold	0 to 15000 rpm	1 rpm	10800	Immediate	At stop
11013	Maximum position pulse frequency	100 to 4000 kHz	1 kHz	4000	Immediate	At stop
11014	Action selection for absolute encoder battery undervoltage fault	<ul> <li>0: Set the battery <ul> <li>undervoltage as a fault;</li> <li>each time the drive is</li> <li>powered on or reset, detect</li> <li>the battery voltage and</li> <li>report an alarm if an</li> <li>undervoltage occurs;</li> <li>detection is disabled during</li> <li>other periods of operation;</li> <li>1: Set the battery</li> <li>undervoltage as an alarm;</li> <li>report an alarm when the</li> <li>battery voltage is lower</li> <li>than 3 V; battery voltage</li> <li>detection is always</li> <li>enabled.</li> </ul></li></ul>	1	0	Immediate	At stop
11015	Function selection when main circuit undervoltage occurs	<ul> <li>Do not report an alarm</li> <li>when main circuit</li> <li>undervoltage is detected;</li> <li>Report an alarm when main circuit undervoltage is detected;</li> <li>Report an alarm when main circuit undervoltage is detected, and implement torque limit.</li> </ul>	1	0	Immediate	At stop
11016	Torque limit value during main circuit undervoltage	0 to 100%	1%	100	Immediate	At stop
11017	Torque limit release time during main circuit undervoltage	0 to 1000 ms	1 ms	10	Immediate	At stop
11018	Type of the last fault	0: No record of abnormalities 1: Overcurrent	1	0	-	At display

Index	Name	Range	Min. unit	Default	Effective time	Property
		2: Main circuit overvoltage				
		3: Control circuit overvoltage				
		4: Motor locked rotor				
		5: Parameter modification				
		without power off				
		6: Phase loss on the input				
		side				
		7: Phase loss on the output				
		side				
		8: Heatsink overheat				
		9: Braking resistor overload				
		10: Power module protection				
		11: Servo drive overload				
		12: Motor overload				
		13: EEPROM read/write error				
		14: Serial port communication				
		error				
		15: Excessively small external				
		brake resistance				
		(Reserved)				
		16: Abnormal current				
		detection circuit				
		17: Reserved				
		18: Poor auto-tuning				
		19: Encoder fault				
		20: Undervoltage during main				
		circuit operation				
		21: Al function conflict				
		22: Parameter setting error				
		23: Communication position				
		reference overflow				
		(Reserved)				
		24: Abnormal Al input				
		25: Inverter module sampling				
		disconnection protection				
		26: Reserved				
		27: Overspeed (The actual				
		speed of the servo motor				
		exceeds the overspeed				
		fault threshold)				
		28: Runaway (Reserved)				

Index	Name	Range	Min. unit	Default	Effective time	Property
		29: Main circuit undervoltage				
		30: Encoder multi-turn count				
		error				
		31: Encoder multi-turn count				
		overflow				
		32: Excessively large position				
		deviation				
		33: Abnormal pulse input				
		34: Excessively large position				
		deviation in fully closed				
		loop				
		35: Function parameter				
		setting error in fully closed				
		loop				
		36: Connection interruption in				
		CAN communication				
		37: Homing timeout				
		38: DI emergency brake				
		(Alarm only)				
		39: Forward over-travel				
		alarm				
		40: Reverse over-travel alarm				
		41: Encoder battery failure				
		42: Reserved				
		43: External fault				
		44: Reserved				
		45: Reserved				
		46: Short circuit to ground at				
		power-on				
		47: Parameter per-unit error				
		48: Internal logic error 1				
		49: Internal logic error 2				
		50 to 54: Reserved				
		55: PN telegram				
		configuration error				
		56: 200P communication				
		disconnection				
		57: Fixed stop point beyond				
		the monitoring window				
		58: Fixed stop point not				
		reached				

Index	Name	Range	Min. unit	Default	Effective time	Property
		59: Running error after the				
		fixed stop point is reached				
		60: Reserved				
		61: Abnormal electronic gear				
		ratio				
		62: Interrupt positioning				
		alarm				
		66: Homing logic error				
		70: Setting error of matching				
		motor number				
		71: Incremental encoder UVW				
		error				
		72: Program burning error				
		73: Bootstrapping failure				
		75: Absolute encoder battery				
		undervoltage				
		76: Absolute encoder battery				
		disconnection				
		77: Encoder type setting error				
		78: No parameter stored in				
		the absolute encoder				
		EEPROM				
		79: Absolute encoder				
		EEPROM parameter write				
		error				
		80: Control circuit				
		undervoltage				
	Type of the second					At
11019	fault	Same as P10.18	1	0	-	display
						At
11020	Type of the first fault	Same as P10.18	1	0	-	display
	Bus voltage at the					At
11021	last fault	0 to 999 V	1 V	0	-	display
	V-phase current at					At
11022	the last fault	0.0 to 999.9 A	0.1 A	0.0	-	display
						At
11023	W-phase current at the last fault	0.0 to 999.9 A	0.1 A	0.0	-	display
	D-axis current					uispiuy
11024		0 0 to 999 9 A	01 4	0.0		At
11024	reference value at the last fault	0.0 to 999.9 A	0.1 A	0.0	-	display
11005		0.0.1000.0.4	011	0.0		A :
11025	Q-axis current	0.0 to 999.9 A	0.1 A	0.0	-	At

Index	Name	Range	Min. unit	Default	Effective time	Property
	reference value at the last fault					display
11026	D-axis current feedback value at the last fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11027	Q-axis current feedback value at the last fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11028	Speed at the last fault	-6000.0 to 6000.0 rpm	0.1 rpm	0.0	-	At display
11029	Encoder position feedback at the last fault (PUU unit)	-2147483648 to 2147483647	1	0	-	At display
11030	DI state at the last fault	LED ones place BITO to BIT3: DI1 to DI4 LED tens place BITO to BIT3: DI5 to DI8 LED hundreds place BITO to BIT1: DI9 to DI10	1	0	-	At display
11031	DO state at the last fault	LED ones place BIT0 to BIT3: DO1 to DO4 LED tens place BIT0 to BIT2: DO5 to DO6	1	0	-	At display
11032	Drive state at the last fault	0 to FFFFH (same as P11.11)	1	0	-	At display
11033	Temperature at the last fault	-40.0°C to 200.0°C	0.1°C	0.0	-	At display
11034	Bus voltage at the second fault	0 to 999 V	1 V	0	-	At display
11035	V-phase current at the second fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11036	W-phase current at the second fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11037	D-axis current reference value at the second fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11038	Q-axis current reference value at the second fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11039	D-axis current feedback value at	0.0 to 999.9 A	0.1 A	0.0	-	At display

Index	Name	Range	Min. unit	Default	Effective time	Property
	the second fault					
11040	Q-axis current feedback value at the second fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11041	Speed at the second fault	-6000.0 to 6000.0 rpm	0.1 rpm	0.0	-	At display
11042	Encoder position feedback at the second fault (PUU unit)	-2147483648 to 2147483647	1	0	-	At display
11043	DI state at the second fault	LED ones place BIT0 to BIT3: DI1 to DI4 LED tens place BIT0 to BIT3: DI5 to DI8 LED hundreds place BIT0 to BIT1: DI9 to DI10	1	0	-	At display
11044	DO state at the second fault	LED ones place BIT0 to BIT3: DO1 to DO4 LED tens place BIT0 to BIT2: DO5 to DO6	1	0	-	At display
11045	Drive state at the second fault	0 to FFFFH (same as P11.11)	1	0	-	At display
11046	Temperature at the second fault	-40.0°C to 200.0°C	0.1°C	0.0	-	At display
11047	Bus voltage at the first fault	0 to 999 V	1 V	0	-	At display
11048	V-phase current at the first fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11049	W-phase current at the first fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11050	D-axis current reference value at the first fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11051	Q-axis current reference value at the first fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11052	D-axis current feedback value at the first fault	0.0 to 999.9 A	0.1 A	0.0	-	At display
11053	Q-axis current	0.0 to 999.9 A	0.1 A	0.0		At

Index	Name	Range	Min. unit	Default	Effective time	Property
	feedback value at the first fault					display
11054	Speed at the first fault	-6000.0 to 6000.0 rpm	0.1 rpm	0.0	-	At display
11055	Encoder position feedback at the first fault (PUU unit)	-2147483648 to 2147483647	1	0	-	At display
11056	DI state at the first fault	LED ones place BITO to BIT3: Dl1 to Dl4 LED tens place BITO to BIT3: Dl5 to Dl8 LED hundreds place BITO to BIT1: Dl9 to Dl10	1	0	-	At display
11057	DO state at the first fault	LED ones place BIT0 to BIT3: DO1 to DO4 LED tens place BIT0 to BIT2: DO5 to DO6	1	0	-	At display
11058	Drive state at the first fault	0 to FFFFH (same as P11.11)	1	0	-	At display
11059	Temperature at the first fault	-40.0°C to 200.0°C	0.1°C	0.0	-	At display
		P11: Display parc	ameters			
11100	Speed command	-6000.0 to 6000.0 rpm	0.1 rpm		-	At display
11101	Actual motor speed	-6000.0 to 6000.0 rpm	0.1 rpm		-	At display
11102	Output voltage	0 to 480 V	1 V		-	At display
11103	Output current	0.0 to 4 le A	0.1 A		-	At display
11104	Q-axis current	-400.0 to +400.0% le	0.1%		-	At display
11105	D-axis current	-100.0 to +100.0% le	0.1%		-	At display
11106	Output torque	-300.00 to +300.00 N⋅m	0.01 N·m		-	At display
11107	Output power	0 to 60000 W	1 W			At display
11108	Average load rate	0.0 to 400.0% Te	0.1%		-	At display

Index	Name	Range	Min. unit	Default	Effective time	Property
11109	Bus voltage	0 to 900 V	1 V		-	At display
11110	Control voltage	0 to 450 V	1 V		-	At display
11111	Servo drive operation status	0 to FFFFH bit0: RUN/STOP bit1: REV/FWD bit2: Running at zero speed bit3: Accelerating bit4: Decelerating bit5: Running at a constant speed bit6: Reserved bit6: Reserved bit7: Reserved bit8: Overcurrent limiting bit9: DC overvoltage limiting bit10: Torque limiting bit11: Speed limiting bit12: Servo drive fault bit13: Speed control bit14: Torque control	1		-	At display
11112	DI terminal status	0 to 3FFH 0: Disconnect 1: Connect The high-speed pulse reference will not be refreshed synchronously.	1		-	At display
11113	DO terminal status	0 to FH 0: Disconnect 1: Connect The high-speed pulse output will not be refreshed synchronously.	1		-	At display
11114	Al1 input voltage	-20.000 to 20.000 V	0.001 V		-	At display
11115	Al2 input voltage	-20.000 to 20.000 V	0.001 V		-	At display
11116	Input pulse frequency	0 to 4000.0 kpps	0.1 kpps		-	At display
11117	Corresponding	-6000.0 to 6000.0 rpm	0.1 rpm		-	At

Index	Name	Range	Min. unit	Default	Effective time	Property
	speed of the input pulse command					display
11118	Motor encoder counter value	0 to 4 times motor encoder lines -1	1		-	At display
11119	Motor encoder Z pulse position	0 to 4 times motor encoder lines -1	1		-	At display
11120	Number of input pulses	-2147483648 to 2147483647			-	At display
11121	Location of the position reference point	-2147483648 to 2147483647	1		-	At display
11122	Position reference	-2147483648 to 2147483647	1		-	At display
11123	Position feedback	-2147483648 to 2147483647	1		-	At display
11124	Position deviation pulse	-2147483648 to 2147483647	1		-	At display
11125	Location of the position reference point (PUU unit)	-2147483648 to 2147483647	1		-	At display
11126	Position reference (PUU unit)	-2147483648 to 2147483647	1		-	At display
11127	Position reference (PUU unit)	-2147483648 to 2147483647	1		-	At display
11128	Position deviation pulse (PUU unit)	-2147483648 to 2147483647	1		-	At display
11129	Accumulated time of power-on	0 to maximum 65535 hours	1 hour		-	At display
11130	Accumulated time of operation	0 to maximum 65535 hours	1 hour		-	At display
11131	Module temperature	-40.0℃ to 150.0℃	0.1℃		-	At display
11132	Encoder single-turn position	0 to 8388608	1		-	At display
11133	Absolute encoder revolutions	0 to 65535 r	1r		-	At display
11134	Load's moment of inertia ratio	0.00 to 120.00	0.01		-	At display
11135	Absolute position PUU value	Present absolute position of the machine (Command	Command unit		-	At display

Index	Name	Range	Min. unit	Default	Effective time	Property
		unit) = Absolute mechanical position / Mechanical gear ratio -2147483648 to 2147483647				
11136	Absolute mechanical position (Lower 32 bits)	Absolute mechanical position refers to the position at the motor end which is	Encoder unit		-	At display
11137	Absolute mechanical position (Higher 32 bits)	converted from the load position in absolute position linear mode or absolute position rotation mode (Encoder unit). Absolute mechanical position = Absolute encoder position - Home offset	Encoder unit		-	At display
11138	Absolute position of the absolute encoder (Lower 32 bits)	Absolute position of the absolute encoder refers to	Encoder unit		-	At display
11139	Absolute position of the absolute encoder (Higher 32 bits)	the feedback absolute position of the absolute encoder. (Encoder unit)	Encoder unit		-	At display
11140	Single-turn position of the rotating load (Lower 32 bits)	Single-turn position of the rotating load refers to the position at the motor end	Encoder unit		-	At display
11141	Single-turn position of the rotating load (Higher 32 bits)	which is converted from the single-turn position of the rotating load in the absolute position rotation mode. (Encoder unit)	Encoder unit		_	At display
11142	Single-turn position of the rotating load	It refers to the single turn position of the rotating load	Command unit		-	At display
11143	Mechanical angle (Number of pulses from home position)	in the absolute position rotation mode. (Command unit)	Encoder unit		-	At display
11144	Electrical angle	0.00 to 360.00°	0.01°		-	At display
11145	Reserved					

Index	Name	Range	Min. unit	Default	Effective time	Property				
	P12: Servo positioning parameters									
11200	Homing enable control	<ul> <li>0: Disable homing</li> <li>1: Enable homing by the HomingStart signal input via DI</li> <li>2: Enable electrical homing by the HomingStart signal input via DI</li> <li>3: Immediately activate homing upon power-on</li> <li>4: Immediately activate homing</li> <li>5: Activate electrical homing</li> <li>6: Take the present position as the home position</li> </ul>	1	0	Immediate	At stop				
11201	Homing method	<ul> <li>0: Homing in forward direction, and the home switch as the deceleration point and the home position;</li> <li>1: Homing in backward direction, and the home switch as the deceleration point and the home position;</li> <li>2: Homing in forward direction, and the motor Z pulse as the deceleration point and the home position;</li> <li>3: Homing in backward direction, and the motor Z pulse as the deceleration point and the home position;</li> <li>3: Homing in backward direction, and the motor Z pulse as the deceleration point and the home position;</li> <li>4: Homing in forward direction, the home switch as the deceleration point, and the motor Z pulse as</li> </ul>	1	9	Immediate	At stop				

Index	Name	Range	Min. unit	Default	Effective time	Property
		the home position;				
		5: Homing in backward direction, the home switch as the deceleration point, and the motor Z pulse as the home position;				
		6: Homing in forward direction direction, and the positive limit switch as the deceleration point and the home position;				
		7: Homing in backward direction, and the negative limit switch as the deceleration point and the home position;				
		8: Homing in forward direction, the positive limit switch as the deceleration point, and the motor Z				
		pulse as the home position; 9: Homing in backward direction, the negative limit switch as the deceleration point, and the motor Z				
11202	Mode of the homing terminal command	pulse as the home position; 0: Level mode 1: Pulse mode	1	0	Immediate	At stop
11203	Reserved					
11204	Positioning acceleration/ deceleration curve selection	0: T-shaped curve 1: S-shaped curve	1	0	Immediate	At stop
11205	Speed of high-speed home position search	0.0 to 1000.0 rpm	0.1 rpm	100.0	Immediate	At stop
11206	Speed of low-speed home position search	0.0 to 1000.0 rpm	0.1 rpm	10.0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
11207	Home offset	-1073741824 to 1073741824	1	0	Immediate	At stop
11208	Acceleration/ Deceleration time of home position search	0 to 65535 ms	1	200	Immediate	At stop
11209	Time limit for home position search	0 to 65535 ms	1	10000	Immediate	At stop
11210	Positioning mode selection	0: Relative position 1: Absolute position	1	0	Immediate	At stop
11211	Positioning lock-up mode	0: Locked at the lock-up point 1: Locked within the lock-up range	1	0	Immediate	At stop
11212	Selection of positioning time sequence	<ul> <li>0: No response to the new positioning signal received during positioning;</li> <li>1: Directly positioning to new position after receiving a new positioning signal during positioning;</li> </ul>	1	0	Immediate	At stop
11213	Position reference of single-point positioning	-1073741824 to 1073741824	1	0	Immediate	During running
11214	Positioning speed	0.1 rpm to P05.17	0.1 rpm	100.	Immediate	During running
11215	Positioning acceleration time	1 to 65535 ms	1 ms	100	Immediate	During running
11216	Positioning deceleration time	1 to 65535 ms	1 ms	100	Immediate	During running
11217	Internal positioning end point setting	1 to 32	1	32	Immediate	At stop
11218	Multi-point positioning mode	<ul> <li>0: Stop after a single operation (Use P12.17 to select the number of segments)</li> <li>1: Cycle operation (Use P12.17 to select the number of segments)</li> <li>2: Operation switchover via DI (Select via DI)</li> </ul>	1	0	Immediate	At stop
11219	Internal position 1 reference	-1073741824 to 1073741824	1	0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
11220	Internal position 2 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11221	Internal position 3 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11222	Internal position 4 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11223	Internal position 5 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11224	Internal position 6 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11225	Internal position 7 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11226	Internal position 8 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11227	Internal position 9 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11228	Internal position 10 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11229	Internal position 11 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11230	Internal position 12 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11231	Internal position 13 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11232	Internal position 14 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11233	Internal position 15 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11234	Internal position 16 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11235	Internal position 1 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11236	Internal position 2 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11237	Internal position 3 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11238	Internal position 4	0 to 65535 ms	1 ms	100	Immediate	During

Index	Name	Range	Min. unit	Default	Effective time	Property
	acceleration/ deceleration time					running
11239	Internal position 5 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11240	Internal position 6 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11241	Internal position 7 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11242	Internal position 8 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11243	Internal position 9 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11244	Internal position 10 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11245	Internal position 11 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11246	Internal position 12 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11247	Internal position 13 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11248	Internal position 14 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11249	Internal position 15 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11250	Internal position 16 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11251	Automatic operation mode timer 1	0 to 600.00 s	0.01 s	1.00	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
11252	Automatic operation mode timer 2	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11253	Automatic operation mode timer 3	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11254	Automatic operation mode timer 4	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11255	Automatic operation mode timer 5	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11256	Automatic operation mode timer 6	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11257	Automatic operation mode timer 7	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11258	Automatic operation mode timer 8	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11259	Automatic operation mode timer 9	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11260	Automatic operation mode timer 10	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11261	Automatic operation mode timer 11	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11262	Automatic operation mode timer 12	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11263	Automatic operation mode timer 13	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11264	Automatic operation mode timer 14	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11265	Automatic operation mode timer 15	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11266	Automatic operation mode timer 16	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11267	Internal position 1 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11268	Internal position 2 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11269	Internal position 3 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11270	Internal position 4 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11271	Internal position 5 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
11272	Internal position 6 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11273	Internal position 7 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During
11274	Internal position 8 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11275	Internal position 9 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11276	Internal position 10 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11277	Internal position 11 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11278	Internal position 12 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11279	Internal position 13 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11280	Internal position 14 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11281	Internal position 15 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11282	Internal position 16 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11283	Position display of the present positioning reference	1 to 32	1	0	Immediate	At stop
11284	Position display of the present positioning completion	1 to 32	1	0	Immediate	At stop
11285	Reserved					
11286	Interrupt positioning enable	0: Disable the interrupt positioning 1: Enable the interrupt positioning	1	0	Immediate	During running
11287	Interrupt positioning displacement	0 to 1073741824	Command unit	10000	Immediate	During running
11288	Speed of the interrupt positioning constant-speed	0.0 to 6000.0 rpm	0.1 rpm	200.0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
	operation					
11289	Acceleration/ Deceleration time of the interrupt positioning	0 to 1000 ms	1 ms	10	Immediate	During running
11290	Interrupt positioning lock release signal enable	0: Disable 1: Enable	1	1	Immediate	During running
		P17: PN param	eters			
11700	PN software version	0 to 99.99	1	1.00	-	At display
11701	Telegram number selection	0 to 65535	1	3	Power-on again	At stop
11702	Additional Telegram	0 to 65535	1	0	Power-on again	At stop
11703	IP address	0 to 0xFFFFFFF	1	0	Power-on again	At stop
11704	Subnet mask	0 to 0xFFFFFFF	1	0	Power-on again	At stop
11705	Default gateway	0 to 0xFFFFFFF	1	0	Power-on again	At stop
11706	Heartbeat threshold	0 to 65535	1	5	Power-on again	At stop
11707	Communication timeout	0 to 1000.0	1	0.1	Power-on again	At stop
11708	User receive word	0 to 65535	1	0	Power-on again	At stop
11709	User send word	0 to 65535	1	0	Power-on again	At stop
11710	Homing offset type	0 to 65535	1	0	Power-on again	At stop
11711	Homing offset	-2147483648 to 2147483647	1	0	Power-on again	At stop
11712	Fixed endstop clamping torque	0 to 655.35	0.01 N·m	0	Immediate	At stop
11713	Maximum following error of the fixed endstop	0 to 2147483647	1	10000	Immediate	At stop
11714	Fixed endstop monitoring window	0 to 2147483647	1	100	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
11715	Speed tolerance	0 to 60000	0.1 rpm	1000	Immediate	At stop
11716	Time tolerance	0 to 65535	1	10	Immediate	At stop
11717	Speed reference	0 to 65535	1	0	Immediate	At stop
11718	MAC address H	0 to 0xFFFFF	1	0	-	At display
11719	MAC address L	0 to 0xFFFFF	1	0	-	At display
11720	Reserved	0 to 65535	1	0	Immediate	At stop
11721	Reserved	0 to 65535	1	0	Immediate	At stop
11722	Reserved	0 to 65535	1	0	Immediate	At stop
11723	Reserved	0 to 65535	1	0	Immediate	At stop
11724	Reserved	0 to 65535	1	0	Immediate	At stop
		P19: Internal positioning	, parameters 2	2	,	
11900	Internal position 17 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11901	Internal position 18 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11902	Internal position 19 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11903	Internal position 20 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11904	Internal position 21 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11905	Internal position 22 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11906	Internal position 23 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11907	Internal position 24 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11908	Internal position 25 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11909	Internal position 26 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11910	Internal position 27 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11911	Internal position 28 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11912	Internal position 29 reference	-1073741824 to 1073741824	1	0	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
11913	Internal position 30 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11914	Internal position 31 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11915	Internal position 32 reference	-1073741824 to 1073741824	1	0	Immediate	During running
11916	Internal position 17 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11917	Internal position 18 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11918	Internal position 19 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11919	Internal position 20 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11920	Internal position 21 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11921	Internal position 22 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11922	Internal position 23 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11923	Internal position 24 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11924	Internal position 25 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11925	Internal position 26 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11926	Internal position 27 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11927	Internal position 28 acceleration/	0 to 65535 ms	1 ms	100	Immediate	During running

Index	Name	Range	Min. unit	Default	Effective time	Property
	deceleration time					
11928	Internal position 29 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11929	Internal position 30 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11930	Internal position 31 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11931	Internal position 32 acceleration/ deceleration time	0 to 65535 ms	1 ms	100	Immediate	During running
11932	Automatic operation mode timer 17	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11933	Automatic operation mode timer 18	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11934	Automatic operation mode timer 19	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11935	Automatic operation mode timer 20	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11936	Automatic operation mode timer 21	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11937	Automatic operation mode timer 22	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11938	Automatic operation mode timer 23	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11939	Automatic operation mode timer 24	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11940	Automatic operation mode timer 25	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11941	Automatic operation mode timer 26	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11942	Automatic operation mode timer 27	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11943	Automatic operation mode timer 28	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11944	Automatic operation mode timer 29	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11945	Automatic operation	0 to 600.00 s	0.01 s	1.00	Immediate	During

Index	Name	Range	Min. unit	Default	Effective time	Property
	mode timer 30					running
11946	Automatic operation mode timer 31	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11947	Automatic operation mode timer 32	0 to 600.00 s	0.01 s	1.00	Immediate	During running
11948	Internal position 17 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11949	Internal position 18 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11950	Internal position 19 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11951	Internal position 20 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11952	Internal position 21 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11953	Internal position 22 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11954	Internal position 23 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11955	Internal position 24 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11956	Internal position 25 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11957	Internal position 26 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11958	Internal position 27 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11959	Internal position 28 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11960	Internal position 29 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11961	Internal position 30 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11962	Internal position 31 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
11963	Internal position 32 positioning speed	0.0 rpm to P05.17	0.1 rpm	100.0	Immediate	During running
		P20: Reserv	ved			
12000	Reserved	0 to 65535	1	0	Immediate	At stop
12001	Reserved	0 to 65535	1	0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
12002	Reserved	0 to 65535	1	0	Immediate	At stop
12003	Reserved	0 to 65535	1	0	Immediate	At stop
12004	Reserved	0 to 65535	1	0	Immediate	At stop
12005	Reserved	0 to 65535	1	0	Immediate	At stop
12006	Reserved	0 to 65535	1	0	Immediate	At stop
12007	Reserved	0 to 65535	1	0	Immediate	At stop
12008	Reserved	0 to 65535	1	0	Immediate	At stop
12009	Reserved	0 to 65535	1	0	Immediate	At stop
12010	Reserved	0 to 65535	1	0	Immediate	At stop
12011	Reserved	0 to 65535	1	0	Immediate	At stop
12012	Reserved	0 to 65535	1	0	Immediate	At stop
12013	Reserved	0 to 65535	1	0	Immediate	At stop
12014	Reserved	0 to 65535	1	0	Immediate	At stop
12015	Reserved	0 to 65535	1	0	Immediate	At stop
12016	Reserved	0 to 65535	1	0	Immediate	At stop
12017	Reserved	0 to 65535	1	0	Immediate	At stop
12018	Reserved	0 to 65535	1	0	Immediate	At stop
12019	Reserved	0 to 65535	1	0	Immediate	At stop
12020	Reserved	0 to 65535	1	0	Immediate	At stop
12021	Reserved	0 to 65535	1	0	Immediate	At stop
12022	Reserved	0 to 65535	1	0	Immediate	At stop
12023	Reserved	0 to 65535	1	0	Immediate	At stop
12024	Reserved	0 to 65535	1	0	Immediate	At stop
12025	Reserved	0 to 10	1	0	Immediate	At stop
12026	Reserved	0 to 65535	1	0	Immediate	At stop
12027	Reserved	0 to 65535	1	0	Immediate	At stop
12028	Reserved	0 to 65535	1	0	Immediate	At stop
12029	Reserved	0 to 65535	1	0	Immediate	At stop
		P21: EPOS program segme	ent control wo	ords		
12100	EPOS program segment 1 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12101	EPOS program segment 2 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
12102	EPOS program segment 3 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12103	EPOS program segment 4 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12104	EPOS program segment 5 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12105	EPOS program segment 6 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12106	EPOS program segment 7 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12107	EPOS program segment 8 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12108	EPOS program segment 9 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12109	EPOS program segment 10 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12110	EPOS program segment 11 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12111	EPOS program segment 12 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12112	EPOS program segment 13 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12113	EPOS program segment 14 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12114	EPOS program segment 15 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12115	EPOS program segment 16 control	0 to 0xFFFFFFF	1	0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
	word					
12116	EPOS program segment 17 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12117	EPOS program segment 18 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12118	EPOS program segment 19 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12119	EPOS program segment 20 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12120	EPOS program segment 21 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12121	EPOS program segment 22 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12122	EPOS program segment 23 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12123	EPOS program segment 24 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12124	EPOS program segment 25 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12125	EPOS program segment 26 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12126	EPOS program segment 27 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12127	EPOS program segment 28 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop
12128	EPOS program segment 29 control word	0 to 0xFFFFFFF	1	0	Immediate	At stop

Index	Name	Range	Min. unit	Default	Effective time	Property
12129	EPOS program					
	segment 30 control	0 to 0xFFFFFFF	1	0	Immediate	At stop
	word					
	EPOS program		1	0	Immediate	At stop
12130	segment 31 control	0 to 0xFFFFFFF				
	word					
	EPOS program					
12131	segment 32 control	0 to 0xFFFFFFF	1	0	Immediate	At stop
	word					

# Chapter 10 Motor Number Quick Reference Table

To operate the M6-F series servo system, it is required to set the correct motor number via the function code P01.00 before the operation starts. Otherwise, normal operation will be disabled. Please check the motor number in the following tables. The medium-inertia motors comprise three types, namely the M series, P series, and N series, in accordance with the design code which is represented by the last letter in the motor model designation.

### 10.1 M series medium-inertia motor number

		e Power (W)	Brake not inclue	ded	Brake include	d
Inertia	Voltage		Motor model	Motor number	Motor model	Motor number
			SPM-SC60602MAK-M	1211	SPM-SC60602MBK-M	1219
		200	SPM-SC10602MAK-M	1214	SPM-SC10602MBK-M	121C
			SPM-SC50602MAK-M	1215	SPM-SC50602MBK-M	121D
		400	SPM-SC60604MAK-M	1221	SPM-SC60604MBK-M	1229
			SPM-SC10604MAK-M	1224	SPM-SC10604MBK-M	122C
			SPM-SC50604MAK-M	1225	SPM-SC50604MBK-M	122D
M series		750	SPM-SC60807MAK-M	1231	SPM-SC60807MBK-M	1239
medium	220 V		SPM-SC10807MAK-M	1234	SPM-SC10807MBK-M	123C
inertia			SPM-SC50807MAK-M	1235	SPM-SC50807MBK-M	123D
			SPM-SC60810MAK-M	1241	SPM-SC60810MBK-M	1249
		1000	SPM-SC10810MAK-M	1244	SPM-SC10810MBK-M	124C
			SPM-SC50810MAK-M	1245	SPM-SC50810MBK-M	124D
		850	SPM-SD61308MAK-M	1251	SPM-SD61308MBK-M	1259
			SPM-SD11308MAK-M	1254	SPM-SD11308MBK-M	125C
			SPM-SD51308MAK-M	1255	SPM-SD51308MBK-M	125D

		5	Brake not inclue	ded	Brake include	ed
Inertia	Voltage	Power (W)	Motor model	Motor number	Motor model	Motor number
			SPM-SD61313MAK-M	1261	SPM-SD61313MBK-M	1269
		1300	SPM-SD11313MAK-M	1264	SPM-SD11313MBK-M	126C
			SPM-SD51313MAK-M	1265	SPM-SD51313MBK-M	126D
			SPM-TD61308MAK-M	2211	SPM-TD61308MBK-M	2219
		850	SPM-TD11308MAK-M	2214	SPM-TD11308MBK-M	221C
			SPM-TD51308MAK-M	2215	SPM-TD51308MBK-M	221D
			SPM-TD61313MAK-M	2221	SPM-TD61313MBK-M	2229
		1300	SPM-TD11313MAK-M	2224	SPM-TD11313MBK-M	222C
			SPM-TD51313MAK-M	2225	SPM-TD51313MBK-M	222D
			SPM-TD61318MAK-M	2231	SPM-TD61318MBK-M	2239
		1800	SPM-TD11318MAK-M	2234	SPM-TD11318MBK-M	223C
			SPM-TD51318MAK-M	2235	SPM-TD51318MBK-M	223D
			SPM-TD61322MAK-M	2251	SPM-TD61322MBK-M	2259
	700.14	2200	SPM-TD11322MAK-M	2254	SPM-TD11322MBK-M	225C
	380 V		SPM-TD51322MAK-M	2255	SPM-TD51322MBK-M	225D
			SPM-TD61829MAK-M	2261	SPM-TD61829MBK-M	2269
		2900	SPM-TD11829MAK-M	2264	SPM-TD11829MBK-M	226C
			SPM-TD51829MAK-M	2265	SPM-TD51829MBK-M	226D
			SPM-TD61844MAK-M	2281	SPM-TD61844MBK-M	2289
		4400	SPM-TD11844MAK-M	2284	SPM-TD11844MBK-M	228C
			SPM-TD51844MAK-M	2285	SPM-TD51844MBK-M	228D
		5500	SPM-TD61855MAK-M	22A1	SPM-TD61855MBK-M	22A9
			SPM-TD11855MAK-M	22A4	SPM-TD11855MBK-M	22AC
			SPM-TD51855MAK-M	22A5	SPM-TD51855MBK-M	22AD
		7500	SPM-TD61875MAK-M	22C1	SPM-TD61875MBK-M	22C9

	David	Brake not included		Brake included		
Inertia	Voltage	Power (W)	Motor model	Motor number	Motor model	Motor number
			SPM-TD11875MAK-M	22C4	SPM-TD11875MBK-M	22CC
			SPM-TD51875MAK-M	22C5	SPM-TD51875MBK-M	22CD

### 10.2 P series medium-inertia motor number

		oltage Power (W)	Brake not inclue	ded	Brake include	d
Inertia	Voltage		Motor model	Motor number	Motor model	Motor number
			SPM-TD61829MAK-P	2271	SPM-TD61829MBK-P	2279
		2900	SPM-TD11829MAK-P	2274	SPM-TD11829MBK-P	227C
			SPM-TD51829MAK-P	2275	SPM-TD51829MBK-P	227D
		4400	SPM-TD61844MAK-P	2291	SPM-TD61844MBK-P	2299
			SPM-TD11844MAK-P	2294	SPM-TD11844MBK-P	229C
P series			SPM-TD51844MAK-P	2295	SPM-TD51844MBK-P	229D
medium inertia	380 V		SPM-TD61855MAK-P	22B1	SPM-TD61855MBK-P	22B9
		5500	SPM-TD11855MAK-P	22B4	SPM-TD11855MBK-P	22BC
			SPM-TD51855MAK-P	22B5	SPM-TD51855MBK-P	22BD
		7500	SPM-TD61875MAK-P	22D1	SPM-TD61875MBK-P	22D9
			SPM-TD11875MAK-P	22D4	SPM-TD11875MBK-P	22DC
			SPM-TD51875MAK-P	22D5	SPM-TD51875MBK-P	22DD

### 10.3 N series medium-inertia motor number

		5	Brake not inclu	ded	Brake include	ed
Inertia	Voltage	Power (W)	Motor model	Motor number	Motor model	Motor number
			SPM-SC60602MAK-N	3211	SPM-SC60602MBK-N	3219
		200	SPM-SC10602MAK-N	3214	SPM-SC10602MBK-N	321C
			SPM-SC50602MAK-N	3215	SPM-SC50602MBK-N	321D
			SPM-SC60604MAK-N	3221	SPM-SC60604MBK-N	3229
		400	SPM-SC10604MAK-N	3224	SPM-SC10604MBK-N	322C
			SPM-SC50604MAK-N	3225	SPM-SC50604MBK-N	322D
			SPM-SC60807MAK-N	3231	SPM-SC60807MBK-N	3239
		750	SPM-SC10807MAK-N	3234	SPM-SC10807MBK-N	323C
	220 V		SPM-SC50807MAK-N	3235	SPM-SC50807MBK-N	323D
		1000	SPM-SC60810MAK-N	3241	SPM-SC60810MBK-N	3249
N series			SPM-SC10810MAK-N	3244	SPM-SC10810MBK-N	324C
medium			SPM-SC50810MAK-N	3245	SPM-SC50810MBK-N	324D
inertia			SPM-SD61308MAK-N	3251	SPM-SD61308MBK-N	3259
		850	SPM-SD11308MAK-N	3254	SPM-SD11308MBK-N	325C
			SPM-SD51308MAK-N	3255	SPM-SD51308MBK-N	325D
			SPM-SD61313MAK-N	3261	SPM-SD61313MBK-N	3269
		1300	SPM-SD11313MAK-N	3264	SPM-SD11313MBK-N	326C
			SPM-SD51313MAK-N	3265	SPM-SD51313MBK-N	326D
			SPM-TD61308MAK-N	4211	SPM-TD61308MBK-N	4219
		850	SPM-TD11308MAK-N	4214	SPM-TD11308MBK-N	421C
	380 V		SPM-TD51308MAK-N	4215	SPM-TD51308MBK-N	421D
		1700	SPM-TD61313MAK-N	4221	SPM-TD61313MBK-N	4229
		1300	SPM-TD11313MAK-N	4224	SPM-TD11313MBK-N	422C

Inertia	Voltage	Power (W)	Brake not included		Brake included	
			Motor model	Motor number	Motor model	Motor number
			SPM-TD51313MAK-N	4225	SPM-TD51313MBK-N	422D
		1800	SPM-TD61318MAK-N	4231	SPM-TD61318MBK-N	4239
			SPM-TD11318MAK-N	4234	SPM-TD11318MBK-N	423C
			SPM-TD51318MAK-N	4235	SPM-TD51318MBK-N	423D
			SPM-TD61322MAK-N	4251	SPM-TD61322MBK-N	4259
		2200	SPM-TD11322MAK-N	4254	SPM-TD11322MBK-N	425C
			SPM-TD51322MAK-N	4255	SPM-TD51322MBK-N	425D
		2900	SPM-TD61829MAK-N	4261	SPM-TD61829MBK-N	4269
			SPM-TD11829MAK-N	4264	SPM-TD11829MBK-N	426C
			SPM-TD51829MAK-N	4265	SPM-TD51829MBK-N	426D
		4400	SPM-TD61844MAK-N	4271	SPM-TD61844MBK-N	4279
			SPM-TD11844MAK-N	4274	SPM-TD11844MBK-N	427C
			SPM-TD51844MAK-N	4275	SPM-TD51844MBK-N	427D
		5500	SPM-TD61855MAK-N	4281	SPM-TD61855MBK-N	4289
			SPM-TD11855MAK-N	4284	SPM-TD11855MBK-N	428C
			SPM-TD51855MAK-N	4285	SPM-TD51855MBK-N	428D
		7500	SPM-TD61875MAK-N	4291	SPM-TD61875MBK-N	4299
			SPM-TD11875MAK-N	4294	SPM-TD11875MBK-N	429C
			SPM-TD51875MAK-N	4295	SPM-TD51875MBK-N	429D

### 10.4 Small-inertia series motor number

	Voltage	Power (W)	Brake not included		Brake included	
Inertia			Motor model	Motor number	Motor model	Motor number
	220 V	200	SPM-SC60602LAK-M	1111	SPM-SC60602LBK-M	1119
			SPM-SC10602LAK-M	1114	SPM-SC10602LBK-M	111C
			SPM-SC50602LAK-M	1115	SPM-SC50602LBK-M	111D
		400	SPM-SC60604LAK-M	1121	SPM-SC60604LBK-M	1129
			SPM-SC10604LAK-M	1124	SPM-SC10604LBK-M	112C
			SPM-SC50604LAK-M	1125	SPM-SC50604LBK-M	112D
		750	SPM-SC60807LAK-M	1131	SPM-SC60807LBK-M	1139
Small-inertia series 22			SPM-SC10807LAK-M	1134	SPM-SC10807LBK-M	113C
			SPM-SC50807LAK-M	1135	SPM-SC50807LBK-M	113D
		1000	SPM-SD61310LAK-M	1141	SPM-SD61310LBK-M	1149
			SPM-SD11310LAK-M	1144	SPM-SD11310LBK-M	114C
			SPM-SD51310LAK-M	1145	SPM-SD51310LBK-M	114D
			SPM-SE61310LAK-M	1151	SPM-SE61310LBK-M	1159
			SPM-SE11310LAK-M	1154	SPM-SE11310LBK-M	115C
			SPM-SE51310LAK-M	1155	SPM-SE51310LBK-M	115D
		1500	SPM-SD61313LAK-M	1161	SPM-SD61313LBK-M	1169
			SPM-SD11313LAK-M	1164	SPM-SD11313LBK-M	116C
			SPM-SD51313LAK-M	1165	SPM-SD51313LBK-M	116D

## 10.5 Large-inertia series motor number

Inertia	Voltage	Power (W)	Brake not included		Brake included	
			Motor model	Motor number	Motor model	Motor number
Large-inertia series	220 V	400	SPM-SC60604HAK-K	1311	SPM-SC60604HBK-K	1319
			SPM-SC10604HAK-K	1314	SPM-SC10604HBK-K	131C
			SPM-SC50604HAK-K	1315	SPM-SC50604HBK-K	131D
		750	SPM-SC60807HAK-K	1321	SPM-SC60807HBK-K	1329
			SPM-SC10807HAK-K	1324	SPM-SC10807HBK-K	132C
			SPM-SC50807HAK-K	1325	SPM-SC50807HBK-K	132D

# Appendix I Warranty and Service

Megmeet rigorously adheres to the ISO 9001:2015 standard in manufacturing motor drive products. If any irregularities occur with our products, please contact the product supplier or the headquarters directly. Megmeet is committed to delivering comprehensive technical support services to all our clients.

#### 1. Warranty period

The warranty period for the product is 18 months from the date of purchase, but not exceeding 24 months after the manufacturing date recorded on the nameplate.

#### 2. Warranty scope

During the warranty period, any abnormalities arising from the responsibility of our company can be repaired or replaced free of charge by our company. However, a certain amount of repair charges may apply even within the warranty period under the following circumstances:

- (1) Damage caused by fire, flood, severe lightning strikes, or similar reasons;
- (2) Man-made damage caused by users' unauthorized modifications;
- (3) Damage due to dropping or transportation after purchase;
- (4) Damage caused by usage beyond the standard specifications or requirements;
- (5) Damage resulting from operation/use not in accordance with the user manual.

#### 3. After-sales service

- (1) If there are special requirements for the installation and commissioning of the drive product, or if the product's performance or functionality is not satisfactory, please contact the product distributor or Megmeet.
- (2) In case of any abnormalities, please seek assistance by contacting the product supplier or Megmeet.
- (3) During the warranty period, any abnormalities caused by manufacturing and design defects will be repaired free of charge by our company.
- (4) Beyond the warranty period, repairs will be conducted at the customer's request and charged by our company.
- (5) Service fees are calculated based on actual costs. Any agreements in place will take precedence.

#### Shenzhen Megmeet Electrical Co., Ltd.

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## Parameter Recording Table

# M6-F Series Servo Drive Warranty Bill

Customer company:					
Detailed address:					
Zip code:	Contact:				
Tel:	Fax:				
Machine model:					
Power:	Machine No.:				
Contract No.:	Purchase date:				
Service unit:					
Contact:	Tel:				
Maintenance person:	Tel:				
Maintenance date:					
Comment on service:					
Excellent     God	od 🗆 Fair 🗆 Unsatisfactory				
Other comment:					
User's signature:	Date:				
Customer Service Center follow-up record:					
Follow-up phone call Follow-up letter					
Other:					
Signature of the technical support engineer: Date:					
Note:					

This bill becomes invalid if the user can not be visited.

Shenzhen Megmeet Electrical Co., Ltd.

# M6-F Series Servo Drive Warranty Bill

Customer company:				
Detailed address:				
Zip code:	Contact:			
Tel:	Fax:			
Machine model:				
Power:	Machine No.:			
Contract No.:	Purchase date:			
Service unit:				
Contact:	Tel:			
Maintenance person:	Tel:			
Maintenance date:				
Comment on service:				
Excellent     God	od 🗆 Fair 🗆 Unsatisfactory			
Other comment:				
User's signature:	Date:			
Customer Service Center follow-up record:				
Follow-up phone call Follow-up letter				
Other:				
Signature of the technical support engineer: Date:				
Note				

Note:

This bill becomes invalid if the user can not be visited.