

✦ This user manual describes all items concerning the operation of this CNC system in detail. However, it is impossible to give particular descriptions for all unnecessary or unallowable operations due to length limitation and products application conditions; Therefore, the items not presented herein should be considered impractical or unallowable.

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PREFACE

Your Excellency,

We are honored by your purchase of this GSK 25i CNC Machining System made by GSK CNC Equipment Co., Ltd.

This book is “PARAMETER” section of the User Manual Volume III.



The incorrect operation may cause the accident, so only the professional can operate the system.

Please read this manual carefully before operation !

Attention:

The power supply fixed on/in the cabinet is exclusively used for the CNC system made by GSK.

It can't be applied to other purposes; otherwise it may cause serious danger.

SAFETY PRECAUTIONS

Before installing, connecting, programming and operating, please read the manual of the product and that of the machine carefully. And operate strictly according to the regulations of the manuals.

This manual includes the precautions for protecting user and machine tool. The precautions are classified into Warning and Caution according to their bearing on safety, and supplementary information is described as Note. Read these Warnings, Cautions and Notes carefully before operation.

Warning

The user may be injured or the equipment be damaged if operation instructions and procedures are not observed.

Caution

The equipment may be damaged if operation instructions or procedures are not observed.

Remark

It is used to indicate the supplementary information other than Warning and Caution.

STATEMENT

- This manual describes various possibilities as much as possible. However, operations allowable or unallowable cannot be explained one by one due to so many possibilities that may involve with, so the contents that are not specially stated in this manual shall be considered as unallowable.

Caution

- Functions, technical indexes (such as precision and speed) described in this user manual are only for this system. Actual function deployment and technical performance of the machine with this CNC system are set by the machine manufacturer design, so functions and technical indexes are subject to the user manual from machine manufacturer.
- Refer to the user manual of the machine manufacturer for the function and meaning of keys on control panel.

Precautions

■ Delivery and storage

- Packing box over 6 layers in pile is NOT allowed.
- Never climb the packing box, neither stand on it, nor place heavy objects on it.
- Do not move or drag the products by the cables connected to it.
- Forbid collision or scratch to the panel and display screen.
- Avoid dampness, insolation and drenching.

■ Open-package inspection

- Confirm that the products are the required ones.
- Check that the products are not damaged in delivery.
- Confirm that the parts in packing box are in accordance with the packing list.
- Contact us in time if any inconsistency, shortage or damage is found.

■ Connection

- Only qualified personnel can connect the system or check the connection.
- The system must be earthed, and the earth resistance must NOT be greater than 0.1 Ω . The earth wire can NOT be replaced by zero wire.
- The connection must be correct and firm to avoid any fault or unexpected consequence.
- Connect with surge diode in the specified direction to avoid damage to the system.
- Switch off power supply before plugging out or opening the electric cabinet.

■ Troubleshooting

- Only competent personnel are supposed to inspect the system or machine.
- Switch off power supply before troubleshooting or changing components.
- Check for fault when the short circuit or the overload occurs. Restart can only be done after troubleshooting.
- Frequent switching on/off of the power is forbidden, and the interval time should be at least 1 min.

SAFETY RESPONSIBILITY

Manufacturer's Responsibility

—Be responsible for the danger which should be eliminated and/or controlled on design and configuration of the provided CNC systems and accessories.

—Be responsible for the safety of the provided CNC systems and accessories.

—Be responsible for the provided information and advice for the users.

User's Responsibility

—Be trained with the safety operation of CNC system and familiar with the safety operation procedures.

—Be responsible for the dangers caused by adding, changing or altering the original CNC systems and the accessories.

—Be responsible for the failure to observe the provisions in the manual for operation, adjustment, maintenance, installation and storage.

All specifications and designs are subject to change without notice.

This manual is kept by the end user.

We are full of heartfelt gratitude to you for supporting us in the use of GSK's products.

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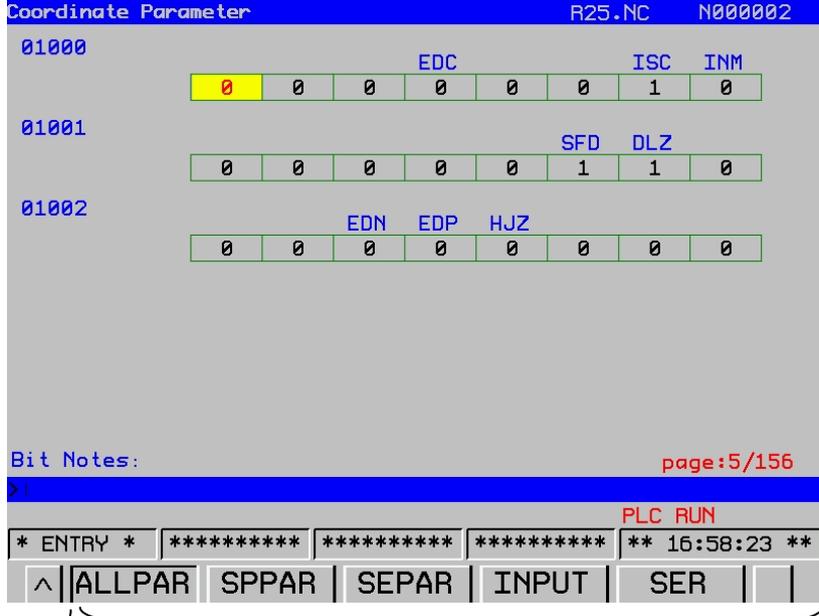
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PARAMETERS

CHAPTER I PARAMETER DISPLAY

The operations are shown below:

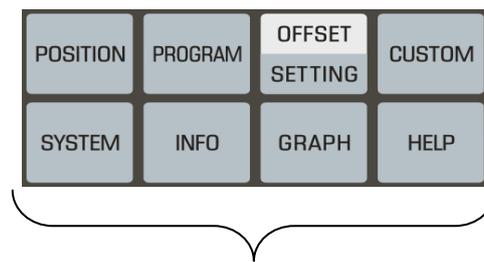
(1) Enter the parameter screen after the function key  on MDI panel is controlled for many times, or press the **[Parameter]** and **[Operation]** soft keys subsequently after pressing the function key  once.



The screenshot shows the 'Coordinate Parameter' screen for R25.NC, N000002. It displays three parameter rows with bit settings:

- 01000**: EDC (bits: 0, 0, 0, 0, 0, 0, 1, 0), ISC, INM
- 01001**: SFD, DLZ (bits: 0, 0, 0, 0, 0, 1, 1, 0)
- 01002**: EDN, EDP, HJZ (bits: 0, 0, 0, 0, 0, 0, 0, 0)

At the bottom, there is a menu bar with keys:  ALLPAR | SPPAR | SEPAR | INPUT | SER. Brackets indicate that the first two keys are for 'Return to the menu keys' and the last three are 'Soft Keys'. A 'PLC RUN' indicator and a timestamp '16:58:23' are also visible.



A 2x4 grid of function keys:

| | | | |
|----------|---------|-------------------|--------|
| POSITION | PROGRAM | OFFSET SETTING | CUSTOM |
| SYSTEM | INFO | GRAPH | HELP |

A bracket below the grid labels them as 'Function keys'.

(2) The parameter screen consists of multiple pages. Use two steps to display the page that contains the parameter you want to display.

(a) The required relative parameters are selected using the soft key, and then the page to be found by the page keys or cursor move keys.

(b) The parameter numbers to be displayed are input from keyboard, and press the **[search]** softkey to search, then the specified parameter page is displayed, and the cursor is positioned to the specified parameter (the data part is turned into the selected color).

Parameters

CHAPTER II PARAMETERE SETTING in MDI MODE

The operation steps of parameters setting are shown below:

- (1) Enter the offset setting page by pressing the **OFFSET** and **SETTING** and firstly input the corresponding password.

To prevent the machining program and CNC parameters from being maliciously modified, the GSK 25i offers an authority setting function and the password can be divided into 9 levels, from the higher to the lower level, such as the 0 level (the system high level), the 1st level (the system service), the 2nd level (the machine manufacturer), the 3rd level (the installation and debugging), the 4th level (the terminal administration), as well as the 5th level (the operator 1 level), the 6th level (the operator 2 level), the 7th level (the operator 3 level) and the lowest default level (see the figure 2-1).

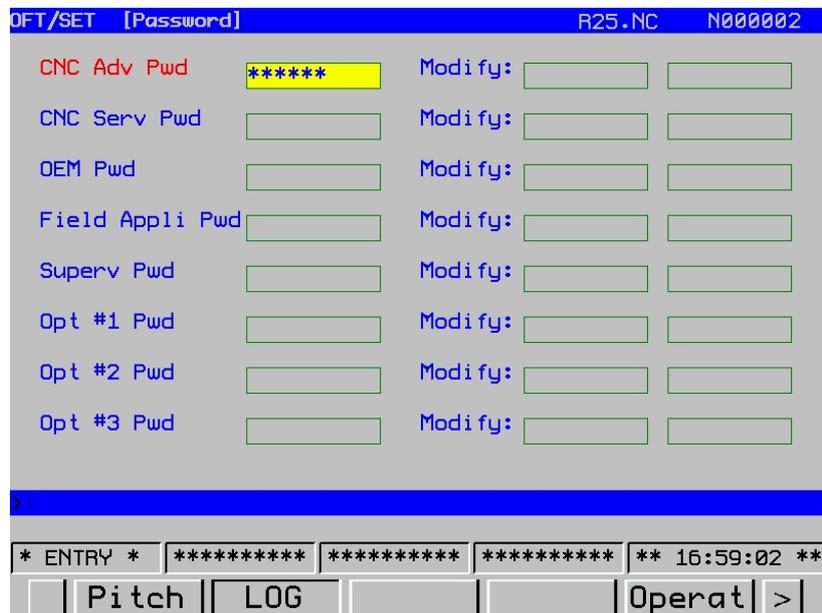


Fig. 2-1

Level 0: the highest authority, reserved by the developer.

Level 1: It is used for the system manufacturer service, which can modify various data.

Level 2: The PLC program, PLC note and the pitch error compensation are modified. The PLC and the pitch error compensation files are input or output. The user customized interface authority is modified/ input or output.

Level 3: The NC parameter and PLC source data can be rewritten; the PLC operation is started/stopped; the alarm/operation messages are eliminated; and the files are input or output, and the system, interpolation and positional control maintenance software can be upgraded.

Level 4: The program, tool offset, setting, workpiece coordinate system offset and macro program value are modified; these files are input or output and it also has the authority to modify the password.

The 5th, 6th and 7th levels: The operation is authorized to the corresponding person with bit-parameter by the end user administrator.

The lowest level default by the system: it is an authority operation donated with bit-parameter by the end user administrator; no password inputs.

The bit-parameter definitions are authorized by the end user administrator, refer to the following table:

| Bit | Significance | Note |
|-----|---|--|
| 0 | Modify/input or output the authority of G code program. | Authority when the bit parameter is set to 1 |
| 1 | Modify the authority of geometrical tool offset/input or output tool offset. | Authority when the bit parameter is set to 1 |
| 2 | Modify the authority of wear tool offset/input or output tool offset. | Authority when the bit parameter is set to 1 |
| 3 | Modify the authority of setting | Authority when the bit parameter is set to 1 |
| 4 | Modify/input or output the authority of a workpiece coordinate system offset. | Authority when the bit parameter is set to 1 |
| 5 | Modify/input or output the authority of a macro program value | Authority when the bit parameter is set to 1 |
| 6 | Reserved | |
| 7 | Reserved | |

Parameters

(2) Input the password of the corresponding level, press . If the password is correct, the system doesn't display any message; otherwise, "the password is wrong" is displayed.

(3) After the corresponding parameters are rewritten, the password is cancelled after logging out and each operator level authority becomes valid.

CHAPTER III SETTING or MAINTAINING the SYSTEM PARAMETERS by PC INSTRUCTION CONTROL UNIT SOFTWARE

3.1 Editing System Parameters

The system parameter of the software can be edited on PC software, and the corresponding backup parameter files can be uploaded and downloaded through the internet. (Refer to the Fig. 3-1 and Fig. 3-2)

Parameters

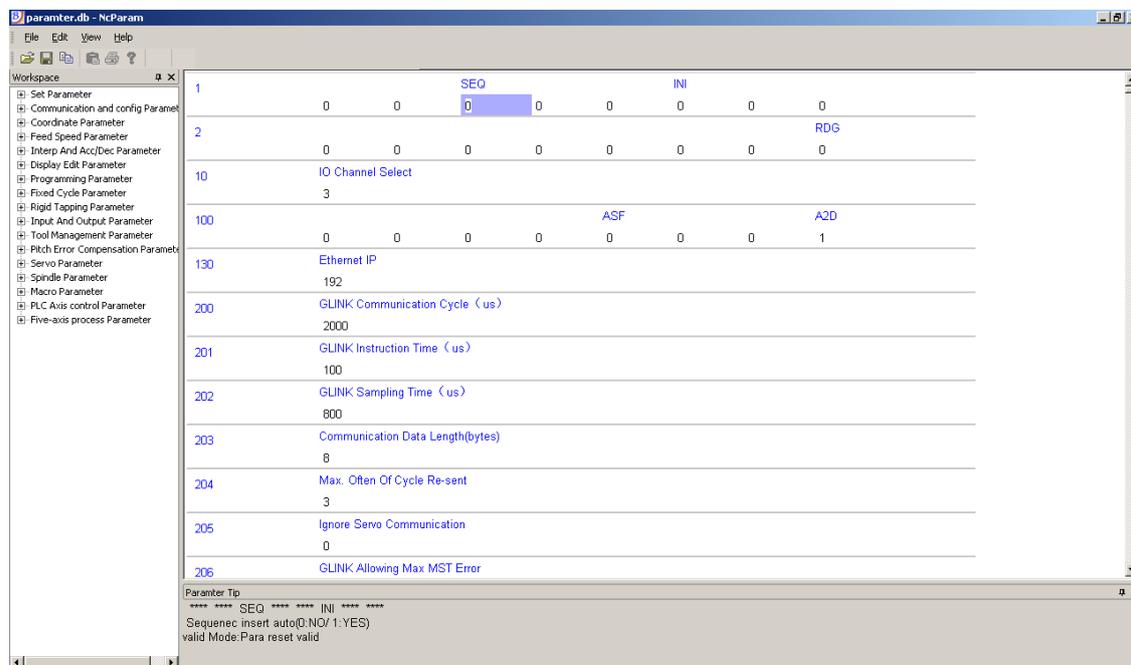


Fig.3-1 Editing the system parameters

3.2 Editing Pitch Error Compensation Data

Editing the pitch error compensation data is shown as the Fig. 3-2.

| Index | Positive pitch | Negative pitch |
|-------|----------------|----------------|
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 0 | 0 |
| 7 | 0 | 0 |
| 8 | 0 | 0 |
| 9 | 0 | 0 |
| 10 | 0 | 0 |
| 11 | 0 | 0 |
| 12 | 0 | 0 |
| 13 | 0 | 0 |
| 14 | 0 | 0 |
| 15 | 0 | 0 |
| 16 | 0 | 0 |
| 17 | 0 | 0 |
| 18 | 0 | 0 |
| 19 | 0 | 0 |
| 20 | 0 | 0 |
| 21 | 0 | 0 |
| 22 | 0 | 0 |
| 23 | 0 | 0 |
| 24 | 0 | 0 |

Parameters

Fig. 3-2 Editing the pitch error compensation data

CHAPTER IV PARAMETER EXPLANATION

[Parameter type]

The system parameters can be divided into several types based upon the following parameters (refer to the table. 4-1).

Table 4-1 Data type and effective data range

| Data type | Effective data range |
|------------------|--------------------------|
| Bit | 0 or 1 |
| Bit axis | 0 or 1 |
| Integrated | -999999~999999 |
| Integral axis | -999999~999999 |
| Real number | -999999.9999~999999.9999 |
| Real number axis | -999999.9999~999999.9999 |

The displayed number of axis type parameter is set by NO.800 for setting the total axis number.

[Parameter explanation format]

The system parameter can be defined based on the following format.

| | |
|------------------|------------------------------------|
| Parameter number | Parameter significance explanation |
|------------------|------------------------------------|

It is important to notice that the cautions may occur in the notice column to remind the user

Note

1. Notice 1
2. Notice 2
3. Notice 3
4.

4.1 Setting Parameters (1~99)

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|------|--|--|-----|--|--|--|--|--|
| 0001 | | | SEQ | | | | | |
|------|--|--|-----|--|--|--|--|--|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid immediately

SEQ: Automatic insertion of sequence numbers

0: Not performed

1: Performed

Remark:

The incremental of sequence number is set in parameter NO.1621.

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|--|--|--|-----|
| 0002 | | | | | | | | RDG |
|-------------|--|--|--|--|--|--|--|-----|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after restarting

RDG: Remote diagnosis is
 0: Not performed
 1: Performed

| | | |
|-------------|---|---|
| 0010 | I/O CHANNEL selection (exclusive for DNC) | 3 |
|-------------|---|---|

[Data type] Integrated type
 [Data range] 0-4
 [Valid mode] Valid after resetting

Remark:
 I/O channel is exclusive for DNC.

| Setting value | Significance |
|---------------|--------------------|
| 0 | RS232C serial port |
| 1 | Reserved |
| 2 | Reserved |
| 3 | USB interface |
| 4 | Ethernet interface |

4.2 Communication and Configuration Parameters (100~999)

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|-----|--|--|-----|
| 0100 | | | | | ASF | | | A2D |
|-------------|--|--|--|--|-----|--|--|-----|

[Data type] Bit type
 [Data range] 0 or 1
 [Default] 0 0 0 0 1 0 0 1
 [Valid mode] Valid after restarting

A2D: DSP loading mode
 0: DSP directly start mode
 1: Loading DSP using CNC program
 ASF: Whether the file is automatically saved during the file is loaded
 0: No
 1: Yes

| | | |
|-------------|---------------------|------|
| 0130 | Ethernet IP address | 1192 |
|-------------|---------------------|------|

[Data type] Integrated type
 [Data range] 0~255255
 [Valid mode] Valid after resetting

Remark:
 For example: The value of IP:192.168.2.10 is 2010 (192.168 is a fixed value)

| | | |
|-----|-------------------------------|------|
| 200 | GSK-LINK communication period | 2000 |
|-----|-------------------------------|------|

[Data type] Integrated type
 [Data unit] us
 [Data range] 100~2000
 [Valid mode] Valid after restarting

| | | |
|-----|-----------------------|-----|
| 201 | GSK-LINK command time | 100 |
|-----|-----------------------|-----|

[Data type] Integrated type
 [Data unit] us
 [Data range] 1~2000
 [Valid mode] Valid after restarting

| | | |
|-----|------------------------|-----|
| 202 | GSK-LINK sampling time | 800 |
|-----|------------------------|-----|

[Data type] Integrated type
 [Data unit] us
 [Data range] 1~2000
 [Valid mode] Valid after restarting

Remark:
 The set command time and sampling time should be in the set communication period range; otherwise, the system is operated based on GSK-LINK communication period command time and sampling time.

| | | |
|-----|-----------------------------------|---|
| 204 | The maximum period repeated times | 3 |
|-----|-----------------------------------|---|

[Data type] Integrated type
 [Data unit] Time
 [Data range] 0~32
 [Valid mode] Valid after restarting

| | | |
|-----|-------------------------------|---|
| 205 | Servo communication ignorance | 0 |
|-----|-------------------------------|---|

[Data type] Integrated type
 [Data unit]
 [Data range] 0~1
 [Valid mode] Valid immediately

Remark:
 The system may ignore the servo net communication when it is set to 1, which is mainly used for debugging.

| | | |
|-----|--|---|
| 206 | MST max. mistakes allowed by GLINK communication | 1 |
|-----|--|---|

[Data type] Integrated type
 [Data unit] Time
 [Data range] 0~16
 [Valid mode] Valid immediately

Remark:
 If it is set as 0, GSK-LINK communication MST mistake check is ignored.

| | | |
|------------|--|---|
| 800 | Selecting the system control axis number | 3 |
|------------|--|---|

[Data type] Integrated type
 [Data range] 2~8
 [Valid mode] Valid after restarting

| | | |
|------------|--|---|
| 801 | Selecting the system linkage axis number | 3 |
|------------|--|---|

[Data type] Integrated type
 [Data range] 2~8
 [Valid mode] Valid after restarting

| | | |
|------------|------------------------------|----|
| 810 | Waiting time of screen saver | 50 |
|------------|------------------------------|----|

[Data type] Integrated type
 [Data unit] Min.
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|------------|-------------------------------------|---|
| 811 | System interpolation period time ms | 2 |
|------------|-------------------------------------|---|

[Data type] Real number type
 [Data unit] ms
 [Data range] 1~4
 [Valid mode] Valid after restarting

| | | |
|------------|-------------------------------------|---|
| 820 | Selecting the system spindle number | 1 |
|------------|-------------------------------------|---|

[Data type] Real number type
 [Data range] 1~ 3
 [Valid mode] Valid immediately

4.3 Coordinate Parameters (1000~1199)

| | | | | | | | | |
|-------------|----|----|----|-----|----|----|-----|-----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1000 | | | | EDC | | | ISC | INM |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 1 0
 [Valid mode] Valid after restarting

INM: Least command increment on the linear axis
 0: In mm (Metric system)
 1: In inches (Inch system)

ISC: The least move unit
 0: 0.001mm or 0.001deg
 1: 0.0001mm or 0.0001deg

EDC: Whether use the external deceleration function
 0: No
 1: Yes

| | | | | | | | | |
|-------------|----|----|----|----|----|----|-----|-----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1001 | | | | | | | SFD | DLZ |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

DLZ: Function setting the reference position without dog
 0: Disabled
 1: Enabled
 SFD: The function for shifting the reference position is
 0: Not used
 1: Used

Remark:
 1. When parameter DLZ (N1001#1) is set as 0, the parameter is invalid; the parameter DLZ (N1001#1) is set as 1, the parameter is valid.
 2. When parameter SFD (N1001.2) is set as 1, the reference point offset amount of each axis in parameter N4120 is valid. At present, the parameter N4120 is invalid.

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|------|--|--|-----|-----|-----|--|--|--|
| 1002 | | | EDN | EDP | HJZ | | | |
|------|--|--|-----|-----|-----|--|--|--|

[Data type] Bit
[Data range] 0 or 1
[Default] 0 0 0 0 1 0 0 0
[Valid] Valid after resetting

HJZ: When a reference position is already set in JOG mode:
 0: Reference position return is performed with deceleration dogs.
 1: Reference position return is performed at rapid traverse speed.
 If the position detection device of the absolute type is used, the parameter is invalid.
 EDP: External deceleration signal in the positive direction for each axis
 0: Valid only for the rapid traverse
 1: Valid for rapid traverse and cutting feed
 EDN: External deceleration signal in the negative direction for each axis
 0: Valid only for rapid traverse
 1: Valid for rapid traverse and cutting feed

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|------|-------|--|------|--|--|--|--|--|
| 1004 | HIDEn | | ZMIn | | | | | |
|------|-------|--|------|--|--|--|--|--|

[Data type] Bit axis
[Data range] 0 or 1
[Default] 0 0 0 0 0 1 0 0
[Valid mode] Valid after resetting

ZMlx: Reference position return direction is set for each axis
 0: In negative
 1: In positive
 HIDEn : Whether the axis is hidden
 0: No
 1: Yes

| | | |
|------|-------------------------------------|----|
| 1020 | Programming axis name for each axis | 88 |
|------|-------------------------------------|----|

[Data type] Integrated axis
[Data range] 65~67, 85~90
[Valid mode] Valid immediately

Remark:
 The display name is ASCII code, and the allowable input values are X 88, Y 89, Z 90, A 65, B 66, C 67, U 85, V 86 and W 87.

| | | |
|-------------|---------------------------------|----|
| 1021 | The subscript of each axis name | 32 |
|-------------|---------------------------------|----|

[Data type] Integrated axis type

[Data range] 0~90

[Valid mode] Valid immediately

| | | |
|----------------|---|--|
| Remark: | 0~9 are digits, 65~90 are ASCII codes, 32 is blank. | |
|----------------|---|--|

| | | |
|-------------|-----------------------------------|---|
| 1022 | Servo logic address for each axis | 0 |
|-------------|-----------------------------------|---|

[Data type] Integrated axis type

[Data range] 0~25

[Valid mode] Valid immediately

| | | |
|----------------|---|--|
| Remark: | The setting of servo logic address is related to the connection of servo network, the 1 st slave station connected from the system P1 terminal is 0, according to this, servo logic address is its corresponding set value; Usually, set a same value both the control axis number and the controlled axis number. | |
|----------------|---|--|

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|-------------|-------------|--|--|-------------|-------------|--|
| 1023 | | RABx | RRLx | | | ROSn | ROTn | |
|-------------|--|-------------|-------------|--|--|-------------|-------------|--|

[Data type] Bit axis

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid after resetting

ROTn: Each axis is the rotation axis or the parallel axis

0: Parallel axis

1: Rotation axis

ROSn: The rotation axis coordinate axis type

0: Rotation axis type (the principle of close to the target)

1: Linear axis type

RRLx: Display in relative coordinate

0: Command value

1: In 360°

RABx : Display in absolute coordinate

0: Command value

1: In 360°

ROSx and **ROTx** used in combination

0 0 Linear axis type

1) Conversion between inch/metric system

2) All the coordinate values are the linear axis type (not recycle in 0°~360°).

3) The stored pitch error compensation is the linear axis type.

0 1 Rotation axis type

1) Conversion between inch/metric system.

2) The machine coordinate value is within 0°~360°.

The relative coordinate and the absolute coordinate values are set by the parameters RRLx and RABx to select the coordinate is displayed in the numerical value or based on 0°~360°.

3) The rotation axis is moved based on the rotation direction closer to the target.

4) The stored pitch error compensation is the rotation axis type.

5) The automatic reference position return (G28 G30) is started from the reference position return direction, the movement distance should not exceed one circumference.

1 0 Setting is invalid

1 1 Linear axis type

1) Not convert between inch/metric system.

2) The machine coordinate value, the relative coordinate value and the absolute coordinate value are linear axis type (not displayed on 0°~360°).

3) The rotation axis is moved on the direction specified by the command value code.

4) The stored pitch error compensation is the linear axis type.

5) It can't be used with the cycle function of the rotation axis and the function of the index table meanwhile.

| | | |
|-------------|---|---|
| 1024 | The attribute of each axis in the basic coordinate system | 0 |
|-------------|---|---|

[Data type] Integrated axis type

[Data range] 0~7

[Valid mode] Valid after resetting

| Setting value | Meaning |
|---------------|--|
| 0 | Neither the basic 3 axes nor the parallel axis |
| 1 | X axis of the basic 3 axes |
| 2 | Y axis of the basic 3 axes |
| 3 | Z axis of the basic 3 axes |
| 5 | The axis parallel to X axis |
| 6 | The axis parallel to Y axis |
| 7 | The axis parallel to Z axis |

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|-----|-----|--|--|--|-----|-----|--|
| 1030 | ITI | IDX | | | | ABS | REL | |
|-------------|-----|-----|--|--|--|-----|-----|--|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 1 1 0

[Valid mode] Valid after resetting

REL: Relative coordinate display of the index rotation axis

0: Out of 360°

1: Within 360°

ABS: Absolute coordinate display of the index rotation axis

0: Out of 360°

1: Within 360°

IDX: Index table indexing sequence.

0: Type A

1: Type B

ITI: The index function of the index table is:

0: Disabled

1: Enabled

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|--|--|--|--------------|
| 1031 | | | | | | | | G_RET |
|-------------|--|--|--|--|--|--|--|--------------|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid immediately

G_RET: Whether the cursor is returned to the program head after resetting
 0: No (with condition)
 1: Yes

| | | |
|-------------|--|---|
| 1040 | External workpiece origin offset value | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1041 | The origin offset amount of workpiece coordinate system 1(G54) | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1042 | The origin offset amount of workpiece coordinate system 2(G55) | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -9999.9999~9999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1043 | The origin offset amount of workpiece coordinate system 3(G56) | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1044 | The origin offset amount of workpiece coordinate system 4(G57) | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1045 | The origin offset amount of workpiece coordinate system 5(G58) | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1046 | The origin offset amount of workpiece coordinate system 6(G59) | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 1050 | Coordinate value of the 1 st reference position on each axis in the mechanical coordinate system | 0 |
|-------------|---|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 1051 | Coordinate value of the 2 nd reference position on each axis in the mechanical coordinate system | 0 |
|-------------|---|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 1052 | Coordinate value of the 3 rd reference position on each axis in the mechanical coordinate system | 0 |
|-------------|---|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 1053 | Coordinate value of the 4 th reference position on each axis in the mechanical coordinate system | 0 |
|-------------|---|---|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 1060 | Movement amount per revolution of the feeding axis | 0 |
|-------------|--|---|

[Data type] Real number axis
 [Data unit] mm or degree
 [Data range] 0~999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-----|
| 1068 | Rotation angle amount per revolution of the rotation axis | 360 |
|-------------|---|-----|

[Data type] Real number axis
 [Data unit] Degree
 [Data range] 0.001~9999.9999
 [Valid mode] Valid after resetting

| |
|--|
| Remark: This parameter is used during cylindrical interpolation. |
|--|

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|-----|--|--|-----|-----|--|-----|
| 1070 | | LZR | | | OT3 | OT2 | | OUT |
|-------------|--|-----|--|--|-----|-----|--|-----|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 1 0 0 0 0 0 0
 [Valid mode] Valid after resetting

- OUT: The forbidden area of the stored stroke check 2
0: Inside
1: Outside
- OT2: Whether stored stroke check 2 is checked for each axis is set.
0: Not checked.
1: Checked.
- OT3: Whether stored stroke inside check 3 is checked for each axis is set.
0: Not checked.
1: Checked.
- LZR: Whether detect the stroke 1 before the machine coordinate system is set
0: Not checked
1: Checked

| | | |
|-------------|--|------|
| 1080 | The boundary coordinate value of the stored stroke check 1 in the positive direction on each axis. | 9999 |
|-------------|--|------|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-------|
| 1081 | The boundary coordinate values of the stored stroke check 1 in the negative direction on each axis. | -9999 |
|-------------|---|-------|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 1082 | The boundary coordinate values of the stored stroke check 2 in the positive direction on each axis. | 9999 |
|-------------|---|------|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-------|
| 1083 | The boundary coordinate values of the stored stroke check 2 in the negative direction on each axis. | -9999 |
|-------------|---|-------|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 1084 | The boundary coordinate values of the stored stroke check 3 in the positive direction on each axis. | 9999 |
|-------------|---|------|

[Data type] Real number axis
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid after resetting

| | | |
|-------------|--|-------|
| 1085 | The boundary coordinate value of the stored stroke check 3 in the negative direction on each axis. | -9999 |
|-------------|--|-------|

[Data type] Real number axis
 [Data unit] mm

[Data range] -999999.9999~999999.9999

[Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 1086 | The boundary coordinate value II of the stored stroke check 1 in the positive direction on each axis. | 9999 |
|-------------|---|------|

[Data type] Real number axis

[Data unit] mm

[Data range] -999999.9999~999999.9999

[Valid mode] Valid after resetting

Remark:

When PLC signal G007#6 EXLM is set as “1”, the stored stroke limit boundary values are set by NO.1086 and NO.1087.

| | | |
|-------------|---|-------|
| 1087 | The boundary coordinate value II of the stored stroke check 1 in the negative direction on each axis. | -9999 |
|-------------|---|-------|

[Data type] Real number axis

[Data unit] mm

[Data range] -999999.9999~999999.9999

[Valid mode] Valid after resetting

Remark:

When PLC signal G007#6 EXLM is set as “1”, the stored stroke limit boundary values are set by NO.1086 and NO.1087.

4.4 Feedrate Parameters (1200~1399)

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|-----|--|-----|--|--|--|-----|
| 1200 | | RDR | | RF0 | | | | RPD |
|-------------|--|-----|--|-----|--|--|--|-----|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid after resetting

RPD: After power on, whether the manual rapid traverse is enabled before the reference position return

0: Disabled

1: Enabled

RF0: When the rapid feedrate override is F0,

0: The machine tool does not stop moving.

1: The machine tool stops moving.

RDR: When the rapid feeding is performed,

0: Dry run is disabled.

1: Dry run is enabled.

| | | |
|-------------|------------------------------------|------|
| 1210 | Dry run speed (common to all axes) | 4000 |
|-------------|------------------------------------|------|

[Data type] Real number

[Data unit] mm/min

[Data range] 0~1000000

[Valid mode] Valid after resetting

Remark:
The dry run speed is set when the manual feedrate is set to 100%.

| | | |
|-------------|---|-----|
| 1211 | The cutting feedrate occurs by default in the automatic mode (common to all axes) | 100 |
|-------------|---|-----|

[Data type] Real number
[Data unit] mm/min
[Data range] 0~10000
[Valid mode] Valid after restarting

Remark:
The defaulted feedrate value is set before commanding the cutting feedrate.

| | | |
|-------------|---|-------|
| 1224 | The maximum cutting composite feedrate (common to all axes) | 10000 |
|-------------|---|-------|

[Data type] Real number
[Data unit] mm/min
[Data range] 0~1000000
[Valid mode] Valid after resetting

| | | |
|-------------|---|-------|
| 1225 | Maximum cutting feedrate for each axis in the automation mode | 10000 |
|-------------|---|-------|

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0~1000000
[Valid mode] Valid after resetting

Remark:
1. The max. cutting feedrate of each axis is set in Auto mode and the feedrate of each axis is limited by the setting value during cutting.
2. The parameter is only valid in the linear interpolation. The speed of the arc and the cylindrical interpolations are limited by #1224.
3. Each axis setting value is 0, the machine doesn't move for any axis movement; while the program is always running in the current block.

| | | |
|-------------|--|-------|
| 1226 | Rapid traverse rate for each axis in the automation mode | 15000 |
|-------------|--|-------|

[Data type] Real number axis
[Data unit] mm/min or degree/min
[Data range] 0~1000000
[Valid mode] Valid after resetting

Remark:
The rapid traverse rate is set when the rapid feedrate override is set to 100%.

| | | |
|-------------|--|-----|
| 1231 | F0 speed of rapid traverse override (common to all axes) | 100 |
|-------------|--|-----|

[Data type] Real number
[Data unit] mm/min or degree/min
[Data range] 0~1000000
[Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 1232 | Feedrate in manual continuous feed (JOG feed) for each axis | 1000 |
|-------------|---|------|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|----------------|--|--|
| Remark: | JOG feedrate is set when manual feedrate override is 100%. | |
|----------------|--|--|

| | | |
|-------------|--|-------|
| 1233 | Manual rapid traverse rate for each axis | 10000 |
|-------------|--|-------|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|--|
| 1234 | FL rate of the reference position return for each axis | The linear rotation axis is 300/ the rotation axis is 75. |
|-------------|--|--|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~15000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 1235 | Reference position return speed for each axis | The linear rotation axis is 4000 /the rotation axis is 2000. |
|-------------|---|---|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 1236 | The 2 nd FL speed of reference position return for each axis | The linear rotation axis is 7 /The rotation axis is 2. |
|-------------|---|---|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~15000
 [Valid mode] Valid after resetting

| | | |
|-------------|-----------------------------|-------|
| 1239 | The maximum manual feedrate | 10000 |
|-------------|-----------------------------|-------|

[Data type] Real number
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|-------|
| 1240 | The maximum speed of single-step operation | 10000 |
|-------------|--|-------|

[Data type] Real number
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|-------------|--------------------------|-------|
| 1241 | The maximum MPG feedrate | 15000 |
|-------------|--------------------------|-------|

[Data type] Real number
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 1250 | The external deceleration speed during cutting feed | 1000 |
|-------------|---|------|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 1251 | The external deceleration speed during rapid traverse | 1000 |
|-------------|---|------|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~1000000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-----|
| 1260 | The safe limit speed during rapid traverse and cutting feed | 100 |
|-------------|---|-----|

[Data type] Real number axis
 [Data unit] mm/min or degree/min
 [Data range] 0~10000
 [Valid mode] Valid after resetting

Remark:
 When PLC signal G019#6 FV is set as "1", it is the top speed during rapid traverse and cutting feed.

Parameters

4.5 Interpolation and Acceleration/Deceleration Control Parameters (1400~1599)

| | | | | | | | | |
|-------------|----|------|----|----|------|----|----|----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1400 | | PACD | | | PPCK | | | |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

PPCK: In-position check
 0: Not performed
 1: Performed
 PACD: The acceleration/deceleration mode before the interpolation
 0: Linear type
 1: S type

| | | | | | | | | |
|-------------|-----|----|----|-----|----|----|----|----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1401 | ALS | | | WFM | | | | |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 1 0 0 0 0
 [Valid mode] Valid after resetting

WFM: MPG interpolation mode
 0: It is treated by the impounding reservoir mode
 1: It is treated by the real-time mode
 ALS: Automatic corner feed function
 0: Invalid
 1: Valid

| | | | | | | | | |
|-------------|----|----|------|-----|----|----|-----|----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1403 | | | RCOK | RBK | | | HXS | |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 1 0 0 1 0
 [Valid mode] Valid after resetting

HXS: The rotation directions of MPG and each axis
 0: Different
 1: Same
 RBK: The backlash compensation is performed between the cutting and rapid traverse.
 0: Not separately
 1: Separately
 RCOK: Backlash compensation
 0: Not performed
 1: Performed

| | | |
|-------------|---|------|
| 1406 | Number of pre-read blocks during pre-read treatment | 1000 |
|-------------|---|------|

[Data type] Integrated
 [Data unit] Block
 [Data range] 0~2000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-----|
| 1407 | The maximum number of the program blocks of Nurbs curve interpolation | 200 |
|-------------|---|-----|

[Data type] Integrated
 [Data unit] Block
 [Data range] 10~500
 [Valid mode] Valid after resetting

| | | |
|-------------|--|----|
| 1409 | Number of prospective treatment blocks | 10 |
|-------------|--|----|

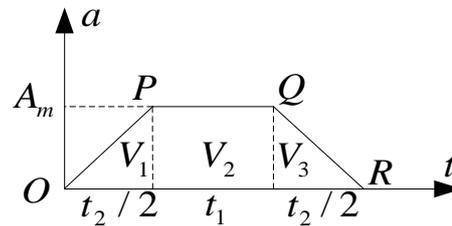
[Data type] Integrated
 [Data unit] block
 [Data range] 1~2000
 [Valid mode] Valid after resetting

Remark:
 The number of the prospective program blocks is set when the prospect is used.

| | | |
|-------------|---|----|
| 1410 | Acceleration/deceleration type S and time constant T1 are specified before the rapid traverse feed is performed | 64 |
|-------------|---|----|

[Data type] Integrated axis
 [Data unit] ms
 [Data range] 1~4000
 [Valid mode] Valid after resetting

The parameter value of its corresponding number is indicated by the P+ parameter number, such as, PA1233 means the NO. 1233 parameter. The acceleration/deceleration calculation mode of type S is shown below, where, the t_1 indicates a uniform acceleration time, t_2 means a jerk and decelerating acceleration time, and A_m is the maximum acceleration.



As the above figure mentioned, the ladder area is: $V_m = \frac{(t_1+t_2)*A_m}{2}$

The maximum acceleration speed calculation is concluded: $A_m = \frac{V_m}{(2t_1+t_2)}$

And, the calculation of jerk time is: $J_m = \frac{2A_m}{t_2}$

The linear acceleration/deceleration can be regarded as a special example when the type S acceleration/deceleration is on the state of $t_2=0$. Before the G00 rapid traverse, the maximum acceleration calculation format of acceleration/deceleration type S is:

$$A_{m00} = \frac{2 \times P_{1226}}{(2 \times P_{1410} + P_{1411})}$$

And the maximum acceleration calculation format

of jerk type S before the G00 rapid traverse is $J_{m00} = \frac{2A_{m00}}{P_{1411}}$

Remark:
When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

| | | |
|-------------|---|-----|
| 1411 | S type acceleration/deceleration time constant T_2 at the rapid feed | 256 |
|-------------|---|-----|

- [Data type] Integral axis
- [Data unit] ms
- [Data range] 0~4000
- [Valid mode] Valid after resetting

Remark:
When the acceleration or jerk calculation is used this format during the application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

| | | |
|-------------|--------------------------------|--|
| 1440 | The maximum acceleration speed | The linear rotation axis is 0.4/the rotation axis is 100 |
|-------------|--------------------------------|--|

- [Data type] Real number axis
- [Data unit] m/s^2 , the rotation axis is: $degree/s^2$, a general rotation axis value is up to 250 times of the parallel axis.
- [Data range] 0~25000
- [Valid mode] Valid after resetting

Parameters

Note
It is only valid to the linear acceleration/deceleration control.

| | | |
|-------------|--|-----|
| 1442 | The maximum acceleration speed of the arc interpolation feed | 0.5 |
|-------------|--|-----|

[Data type] Real number
[Data unit] m/s²
[Data range] 0~25000
[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 1444 | Mechanical zero return acceleration speed by default | The linear rotation axis is 0.139/ The rotation axis is 80 |
|-------------|--|---|

[Data type] Real number axis
[Data unit] m/s², the rotation axis is: degree/s², a general rotation axis value is up to 250 times of the parallel axis.
[Data range] 0~25000
[Valid mode] Valid after resetting

| | | |
|-------------|--|-----|
| 1445 | The acceleration speed is performed during deceleration when dwelling or RESET in the process of operation | 0.5 |
|-------------|--|-----|

[Data type] Real number
[Data unit] m/s²
[Data range] 0~25000
[Valid mode] Valid after resetting

| | | |
|-------------|------------------------|-----|
| 1446 | MPG acceleration speed | 0.5 |
|-------------|------------------------|-----|

[Data type] Real number
[Data unit] m/s²
[Data range] 0~25000
[Valid mode] Valid after resetting

| | | |
|-------------|---------------------------|-----|
| 1447 | Manual acceleration speed | 0.5 |
|-------------|---------------------------|-----|

[Data type] Real number
[Data unit] m/s²
[Data range] 0~25000
[Valid mode] Valid after resetting

| | | |
|-------------|------------------------------------|-------|
| 1472 | Arc interpolation control accuracy | 0.001 |
|-------------|------------------------------------|-------|

[Data type] Real number
[Data unit] mm
[Data range] 0~1
[Valid mode] Valid after resetting

| | | |
|-------------|---|-------|
| 1473 | The maximum contour error of the system | 0.005 |
|-------------|---|-------|

[Data type] Real number
[Data unit] mm
[Data range] 0~1
[Valid mode] Valid after resetting

| | | |
|-------------|---|----|
| 1480 | The acceleration/deceleration S type time constant T1 before cutting feed | 16 |
|-------------|---|----|

[Data type] Integral axis
[Data unit] ms

[Data range] 0~4000
[Valid mode] Valid after resetting

The maximum acceleration calculation format of acceleration/deceleration type S before the G01 rapid traverse is:

$$A_{m01} = \frac{2 \times P_{1225}}{(2 \times P_{1480} + P_{1481})}$$
 , and the maximum jerk calculation format of

acceleration/ deceleration type S before the G01 rapid traverse is $J_{m01} = \frac{2 A_{m01}}{P_{1481}}$.

Remark:
 When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

| | | |
|-------------|---|-----|
| 1481 | Acceleration/deceleration S type time constant T2 before cutting feed | 256 |
|-------------|---|-----|

[Data type] Integral axis
[Data unit] ms
[Data range] 0~4000
[Valid mode] Valid after resetting

| | | |
|-------------|---|--------|
| 1493 | The minimum acceleration speed during Nurbs interpolation | 1. 000 |
|-------------|---|--------|

[Data type] Real number
[Data unit] m/s²
[Data rang] 0~25000
[Valid mode] Valid after resetting

Remark:
 When the acceleration or jerk calculation is used this format during the actual application; it is very necessary to note that the unit conversion must be performed in terms of the unit of parameters.

| | | |
|-------------|--|----|
| 1494 | Judge the least corner of Nurbs interpolation deceleration point | 10 |
|-------------|--|----|

[Data type] Real number
[Data unit] deg
[Data range] 0~30
[Valid mode] Valid after resetting

| | | |
|-------------|--|-----|
| 1495 | The least corner angle of fold line transition | 150 |
|-------------|--|-----|

[Data type] Real number
[Data unit] deg
[Data range] 120~180
[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 1500 | The boundary corner of two blocks in the automatic corner deceleration | 0 |
|-------------|--|---|

[Data type] Real number
[Data unit] deg
[Data range] 0~60
[Valid mode] Valid after resetting

| | | |
|-------------|--|-----|
| 1501 | The allowable max. speed variable amount | 120 |
|-------------|--|-----|

[Data type] Real number
 [Data unit] mm/min
 [Data range] 0~1000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|-----|
| 1505 | The lowest deceleration speed based on acceleration during arc interpolation | 200 |
|-------------|--|-----|

[Data type] Real number
 [Data unit] mm/min
 [Data range] 0~9999.9999
 [Valid mode] Valid after resetting

4.6 Display Editing Parameters (1600~1799)

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|-----|-----|--|--|--|--|
| 1601 | | | ENG | CHI | | | | |
|-------------|--|--|-----|-----|--|--|--|--|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 1 0 0 0 0
 [Valid mode] Valid after resetting

ENG, CHI: Language selection

| ENG | CHI | Language display |
|-----|-----|--------------------|
| 0 | 0 | Simplified Chinese |
| 0 | 1 | |
| 1 | 1 | English |
| 1 | 0 | |

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|------------|--|--|--|------------|-------------|--|
| 1605 | | NPA | | | | MKP | RDGN | |
|-------------|--|------------|--|--|--|------------|-------------|--|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 1
 [Valid mode] Valid immediately

RDGN: Diagnosis data during resetting

0: Not clear
 1: Clear

MKP: M02, M30 or % is in MDI, whether MDI program is automatically deleted

0: Not automatically deleted
 1: Automatically deleted

NPA: Whether switch into the alarm interface when the alarm occurs

0: No
 1: Yes

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|-----|--|--|--|-----|
| 1610 | | | | NE9 | | | | NE8 |
|-------------|--|--|--|-----|--|--|--|-----|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 1 0 0 0 0
 [Valid mode] Valid immediately

NE8: Whether forbid the subprogram edit of the program numbers from 8000 to 8999

- 0: Not forbid
- 1: Forbid

The following operations are not allowed in the forbidden state

- 1) Deleting the program (#O8000-#O8999 can't be deleted)
- 2) Outputting the program
- 3) Editing the logged program
- 4) Logging in the program
- 5) Displaying the program

NE9: Whether forbid the subprogram edit of the program numbers from 9000 to 9999

- 0: Not forbid
- 1: Forbid

The following operations are not allowed in the forbidden state

- 1) Deleting the program (#O9000-#O9999 can't be deleted)
- 2) Outputting the program
- 3) Editing the logged program
- 4) Logging in the program
- 5) Displaying the program

| | | |
|-------------|--|----|
| 1621 | The incremental value when the sequence number is automatically inserted | 10 |
|-------------|--|----|

[Data type] Integrated

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 1640 | The required machining part quantity is 1 | 0 |
|-------------|---|---|

[Data type] Integrated

[Data range] 0~999999

[Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1641 | The required machining parts quantity is 2 | 0 |
|-------------|--|---|

[Data type] Integrated

[Data range] 0~999999

[Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1642 | The required machining parts quantity is 3 | 0 |
|-------------|--|---|

[Data type] Integrated

[Data range] 0~999999

[Valid mode] Valid immediately

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|--|------|------|------|
| 1687 | | | | | | DEF3 | DEF2 | DEF1 |
|-------------|--|--|--|--|--|------|------|------|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 1

[Valid mode] Valid immediately

Remark:
DEF1-DEF3, the default color configuration program, the above-mentioned configuration color can become valid only when all default bits are set to 0.

4. 7 Programming Parameters (1800~1999)

| | | | | | | | | | |
|------|-----|-----|-----|-----|-------|--|--|--|-----|
| 1800 | G80 | G50 | G69 | G15 | G50.1 | | | | DPI |
|------|-----|-----|-----|-----|-------|--|--|--|-----|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid immediately

DPI: The decimal point is ignored when programming

0: It is treated as the least set unit

1: It is regarded as mm, sec

G50.1: Whether G51.1 mode is cleared during resetting

0: Clear the mode

1: Not clear the mode

G15: Whether G16 mode is cleared during resetting

0: Clear the mode

1: Not clear the mode

G69: Whether G68 mode is cleared during resetting

0: Clear the mode

1: Not clear the mode

G50: Whether G51 mode is cleared during resetting

0: Clear the mode

1: Not clear the mode

G80: The canned cycle mode is cleared during resetting

0: Clear the mode

1: Not clear the mode

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|------|--|--|--|--|-----|-----|-----|-----|
| 1801 | | | | | G91 | G19 | G18 | G01 |
|------|--|--|--|--|-----|-----|-----|-----|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid immediately

G01: When the system is powered on or the state is cleared, the mode is

0: G00 mode

1: G01 mode

G18, G19: When the power is turned on or the state is cleared, the plane selection is:

| G19 | G18 | Plane selection |
|-----|-----|-----------------|
| 0 | 0 | G17 |
| 0 | 1 | G18 |
| 1 | 0 | G19 |

G91: When the power is turned on or the state is cleared:

0: G90 mode

1: G91 mode

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|------|--|-----|--|--|--|--|--|--|
| 1803 | | M3B | | | | | | |
|------|--|-----|--|--|--|--|--|--|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 1 0 0 0 0 0 0

[Valid mode] Valid immediately

M3B: Number of M codes which can be commanded in one program

0: 1

1: Max. 3

| | | |
|-------------|-------------------------------|------|
| 1810 | Allowable error of arc radius | 0.01 |
|-------------|-------------------------------|------|

[Data type] Real number
 [Data unit] mm
 [Data range] 0.0005~0.1
 [Valid mode] Valid immediately

| | | | | | | | | |
|-------------|----|-----|----|----|-----|----|----|-----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1850 | | XSC | | | SCL | | | RIN |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 1 0 0 0
 [Valid mode] Valid immediately

RIN: The rotation angle of its coordinate rotation
 0: Absolute coordinate command
 1: G90/G91 command
 SCL: Scaling function
 0: Disabled
 1: Enabled
 XSC: Scaling based on each axis
 0: Disabled (dedicated by P)
 1: Enabled (dedicated by IJK)

| | | |
|-------------|---|---|
| 1860 | The rotation angle is used when the angle in coordinate rotation is not commanded | 0 |
|-------------|---|---|

[Data type] Real number
 [Data unit] deg
 [Data range] -360.000~ 360.000
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 1861 | The scaling override is used when the scaling command override does not occur. | 1 |
|-------------|--|---|

[Data type] Real number
 [Data range] 0~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|---|
| 1862 | Scaling override for each axis | 1 |
|-------------|--------------------------------|---|

[Data type] Real number axis
 [Data range] -999999.9999~ 999999.9999
 [Valid mode] Valid immediately

| | | | | | | | | |
|-------------|----|----|----|----|----|----|----|-----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 1870 | | | | | | | | MDL |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately
 MDL: Single direction positioning G code (G60)
 0: The mode code does not set
 1: Mode code

| | | |
|-------------|---|---|
| 1880 | The direction and overtravel amount of single direction positioning for each axis | 0 |
|-------------|---|---|

[Data type] Real number axis

[Data unit] mm
 [Data range] -1000~1000
 [Valid mode] Valid immediately

| | | | | | | | |
|-------------|------------------------------------|--|--|--|--|--|---|
| 1931 | The least angle of the index table | | | | | | 0 |
|-------------|------------------------------------|--|--|--|--|--|---|

[Data type] Real number
 [Data unit] deg
 [Data range] 0~360.000
 [Valid mode] Valid immediately

| | | | | | | | |
|-------------|---|--|--|--|--|--|---|
| 1932 | Setting the index axes of the index table | | | | | | 0 |
|-------------|---|--|--|--|--|--|---|

[Data type] Integrated
 [Data range] 0~8
 [Valid mode] Valid after resetting

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|-----|--|--|--|--|--|--|--|
| 1940 | SKF | | | | | | | |
|-------------|-----|--|--|--|--|--|--|--|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

SKF: Whether G31 skip command is valid to the dry run, override and automatic acceleration/deceleration is:

0: Valid
 1: Invalid

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|-----|--|--|--|--|--|--|-----|
| 1950 | MOU | | | | | | | MIN |
|-------------|-----|--|--|--|--|--|--|-----|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

MOU: Whether input the M, S, T and B codes when the program is restarted:

0: Not output
 1: Output

MIN: Manual intervention and return function:

0: Invalid
 1: Valid

| | | | | | | | |
|-------------|--|--|--|--|--|--|------------------|
| 1960 | The move sequence for each axis when the program is restarted or the manual intervention functions | | | | | | 1, 1, 3, 2, 2 |
|-------------|--|--|--|--|--|--|------------------|

[Data type] Integral axis
 [Data range] 1~Controllable axis number
 [Valid mode] Valid immediately

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|-----|-----|--|--|--|--|--|--|
| 1971 | ESC | ESR | | | | | | |
|-------------|-----|-----|--|--|--|--|--|--|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

ESR: External program number index
 0: Invalid
 1: Valid
 ESC: The reset is input from ESTB input to start indexing
 0: Index performed
 1: Index not performed

4.8 Canned Cycle Parameters (2000~2099)

| | | | | | | | | |
|-------------|-----|----|-----|-----|----|----|----|-----|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 2000 | PCP | | RD2 | RD1 | | | | FXY |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

FXY: The drilling axis in the drilling canned cycle is:
 0: Always the Z-axis
 1: The axis selected by the program

RD2, RD1 Set the retraction axis direction of G76 or G87

| | | | | |
|-----|-----|-----|-----|-----|
| RD2 | RD1 | G17 | G18 | G19 |
| 0 | 0 | +X | +Z | +Y |
| 0 | 1 | -X | -Z | -Y |
| 1 | 0 | +Y | +X | +Z |
| 1 | 1 | -Y | -X | -Z |

PCP: Rigid tapping
 0: High-speed peck tapping
 1: Not perform high-speed peck tapping

| | | |
|-------------|--|-----|
| 2010 | The retraction amount d of high-speed peck tapping cycle G73 | 0.5 |
|-------------|--|-----|

[Data type] Real number
 [Data unit] mm
 [Data range] 0~100
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|-----|
| 2011 | Clearance d of canned cycle G83 | 0.5 |
|-------------|---------------------------------|-----|

[Data type] Real number
 [Data unit] mm
 [Data range] 0~100
 [Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 2034 | Clearance of small diameter peck drilling cycle | 0.5 |
|-------------|---|-----|

[Data type] Real number
 [Data unit] mm
 [Data range] 0~100
 [Valid mode] Valid immediately

Parameters

4.9 Rigid Tapping Parameters (2100~2299)

| | | |
|-------------|--|------|
| 2105 | Setting the synchronous error width during rigid tapping | 1000 |
|-------------|--|------|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 2106 | In-position width of the tapping axis during the rigid tapping | 100 |
|-------------|--|-----|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 2107 | In-position width of the spindle during the rigid tapping | 100 |
|-------------|---|-----|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 2112 | Retraction or clearance amounts in tapping cycle | 0.5 |
|-------------|--|-----|

[Data type] Real number
 [Data unit] mm
 [Data range] 0~100
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 2113 | The default time without specifying P during rigid tapping | 350 |
|-------------|--|-----|

[Data type] Integrated
 [Data unit] ms
 [Data range] 350~1000
 [Valid mode] Valid immediately

Remark:

1. The parameter is only valid in the parameters G74,G84 and G88.
2. The parameter also means: The dwell time of the spindle CCW rotation during G74 and G84 cutting and retraction.

| | | |
|-------------|---|-------|
| 2120 | Limit value of position offset amount during the tapping axis moving of the rigid tapping | 30000 |
|-------------|---|-------|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-------|
| 2121 | Limit value of position offset amount during the spindle moving of the rigid tapping | 30000 |
|-------------|--|-------|

[Data type] Integrated
 [Data unit] Detection unit

Parameters

[Data range] 0~999999

[Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 2122 | Limit value of position offset amount during the tapping axis stopping of the rigid tapping | 1000 |
|-------------|---|------|

[Data type] Integrated

[Data unit] Detection unit

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2123 | Limit value of position offset amount during the spindle stopping of the rigid tapping | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data unit] Detection unit

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2140 | The maximum speed of spindle (the 1 st gear) in rigid tapping | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data unit] rpm

[Data range] 0~9999

[Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 2141 | The maximum speed of spindle (the 2 nd gear) in rigid tapping | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data unit] rpm

[Data range] 0~9999

[Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 2142 | The maximum speed of spindle (the 3 rd gear) in rigid tapping | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data unit] rpm

[Data range] 0~9999

[Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 2143 | The maximum speed of spindle (the 4 th gear) in rigid tapping | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data unit] rpm

[Data range] 0~9999

[Valid mode] Valid after resetting

| | | |
|-------------|---|------|
| 2170 | The position control circuit gain is performed (the 1 st gear) between spindle and tapping axis when the rigid tapping is performed. | 1000 |
|-------------|---|------|

[Data type] Integrated

[Data unit] 0.01/s

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 2171 | The position control circuit gain is performed (the 2 nd gear) between spindle and tapping axis when the rigid tapping is performed. | 1000 |
|-------------|---|------|

[Data type] Integrated

[Data unit] 0.01/s

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 2172 | The position control circuit gain is performed (the 3 rd gear) between spindle and tapping axis when the rigid tapping is performed. | 1000 |
|-------------|---|------|

[Data type] Integrated

[Data unit] 0.01/s

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 2173 | The position control circuit gain is performed (the 4 th gear) between spindle and tapping axis when the rigid tapping is performed. | 1000 |
|-------------|---|------|

[Data type] Integrated

[Data unit] 0.01/s

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2180 | Spindle circuit gain coefficient in rigid tapping (the 1 st gear) | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2181 | Spindle circuit gain coefficient in rigid tapping (the 2 nd gear) | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2182 | Spindle circuit gain coefficient in rigid tapping (the 3 rd gear) | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2183 | Spindle circuit gain coefficient in rigid tapping (the 4 th gear) | 1000 |
|-------------|--|------|

[Data type] Integrated

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 2210 | Spindle backlash compensating value of rigid tapping (the 1 st gear) | 10 |
|-------------|---|----|

[Data type] Integrated

[Data unit] Detection unit

[Data range] 1~127

[Valid mode] Valid after resetting

| | | |
|-------------|---|----|
| 2211 | Spindle backlash compensating value of rigid tapping (the 2 nd gear) | 10 |
|-------------|---|----|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 1~127
 [Valid mode] Valid after resetting

| | | |
|-------------|---|----|
| 2212 | Spindle backlash compensating value of rigid tapping (the 3 rd gear) | 10 |
|-------------|---|----|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 1~127
 [Valid mode] Valid after resetting

| | | |
|-------------|---|----|
| 2213 | Spindle backlash compensating value of rigid tapping (the 4 th gear) | 10 |
|-------------|---|----|

[Data type] Integrated
 [Data unit] Detection unit
 [Data range] 1~127
 [Valid mode] Valid after resetting

4.10 Parameters of Input and Output (2400~2599)

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|-----|----|-----|----|-----|----|----|------|
| 2401 | LTM | | DEC | | SWI | | | PLCP |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

- PLCP: Whether PLC parameter data file is upgraded
 0: Not upgrade
 1: Upgrade
- SWI: Whether the symbol of the position switch is valid
 0: Invalid
 1: Valid
- DEC: The deceleration signal during the reference position return
 0: Decelerate when it is 0
 1: Decelerate when it is 1
- LTM: Process method of the hardware limit
 0: Decelerate when it is the hardware limit
 1: Stop immediately

| | | |
|-------------|--|----|
| 2410 | The dwell times of the selective signals MF, SF, TF and BF | 64 |
|-------------|--|----|

[Data type] Integrated
 [Data unit] ms
 [Data range] 16~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 2411 | The acceptable width of finish signals of M, S, T and B signals | 64 |
|-------------|---|----|

[Data type] Integrated

[Data unit] ms
 [Data range] 16~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 2412 | Addresses assigned to the skip signals | 0 |
|-------------|--|---|

[Data type] Integrated
 [Data range] 0~127
 [Valid mode] Valid immediately

Remark:
 It is invalid when the parameter is less than 10.

| | | |
|-------------|---|---|
| 2413 | Addresses assigned to the measuring in-position signals | 0 |
|-------------|---|---|

[Data type] Integrated
 [Data range] 0~127
 [Valid mode] Valid immediately

Remark:
 It is invalid when the parameter is less than 10.

| | | |
|-------------|-------------------------------------|-----|
| 2418 | Time of the resetting signal output | 600 |
|-------------|-------------------------------------|-----|

[Data type] Integrated
 [Data unit] ms
 [Data range] 0~1000
 [Valid mode] Valid immediately

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|--|--|--|------------|
| 2430 | | | | | | | | EMS |
|-------------|--|--|--|--|--|--|--|------------|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

EMS: Extended the external mechanical origin offset function
 0: Invalid
 1: Valid

| | | |
|-------------|---|-----|
| 2431 | The signal starting address used in the extended external mechanical origin offset function | 100 |
|-------------|---|-----|

[Data type] Integrated
 [Data unit] ms
 [Data range] 0~1844
 [Valid mode] Valid immediately

| | | |
|------------------|---|---|
| 2500-2531 | The servo axis corresponding to the position switch | 0 |
|------------------|---|---|

[Data type] Integrated
 [Data range] 0~8
 [Valid mode] Valid immediately

Remark:
 1. The position switch function is valid when bit SWI is 1.
 2. The position switch is invalid when it is 0.

Parameters

| | | |
|------------------|--|---|
| 2532-2563 | The positive max. range of the position switch | 0 |
|------------------|--|---|

[Data type] Real number
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|------------------|--|---|
| 2564-2595 | The negative max. range of the position switch | 0 |
|------------------|--|---|

[Data type] Real number
 [Data range] -999999.9999 ~ 999999.9999
 [Valid mode] Valid immediately

4.11 Tool Administration Parameters (2600~2799)

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|----|----|----|----|----|----|-----|-----|
| 2600 | | | | | | | TLB | SUB |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 1 1
 [Valid mode] Valid immediately

- SUB: Tool start-up type of the tool radius compensation
 - 0: Type A
 - 1: Type B
- TLB: Tool length compensation selection
 - 0: Tool compensation A (Always Z axis irrespective of plane specification)
 - 1: Tool compensation B (Axis vertical to the specified plane)

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|-----|-----|----|----|----|-----|----|----|
| 2601 | ODI | LVK | | | | CCN | | |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 1 0 0 0 0 1 0 0
 [Valid mode] Valid immediately

- CCN: Whether cutter compensation is cancelled when G28 commands the tool moves to the intermediate position
 - 0: The cutter compensation is cancelled.
 - 1: The cutter compensation is cancelled until the tool moves to the reference position.
- LVK: During resetting, the tool length offset value is
 - 0: Not cleared
 - 1: Cleared
- ODI: The cutter compensation amount is set by:
 - 0: The diameter value
 - 1: The radius value

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|----|----|----|----|----|-----|-----|-----|
| 2602 | | | | | | TPH | CNI | OIM |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

OIM: When the unit is switched between the inch and metric systems, whether the manual input data are converted:

- 0: Not automatically converted
- 1: Automatically converted

CNI: Interference check for radius compensation is:

- 0: Performed
- 1: Not performed

TPH: The addresses of the commanded tool position offset numbers G45-G48

- 0: With H code
- 1: With D code

| | | |
|-------------|---|------|
| 2610 | The vector limit value is ignored when cutter compensation moves along with the corner outside. | 0.01 |
|-------------|---|------|

[Data type] Real number

[Data unit] mm

[Data range] 0~100

[Valid mode] Valid immediately

| | | |
|-------------|--|----|
| 2611 | The maximum amount of tool wear compensation value | 60 |
|-------------|--|----|

[Data type] Real number

[Data unit] mm

[Data range] 0~100.0000

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 2651 | Automatic tool length compensation measuring speed | 1000 |
|-------------|--|------|

[Data type] Real number

[Data unit] mm/min

[Data range] 0~15000

[Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 2652 | The value r of automatic tool length compensation measure | 0 |
|-------------|---|---|

[Data type] Real number

[Data range] 0~10000

[Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 2653 | The value e of automatic tool length compensation | 0 |
|-------------|---|---|

[Data type] Real number

[Data range] 0~10000

[Valid mode] Valid immediately

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|-----|--|--|-----|-----|-----|
| 2700 | | | EIS | | | LTM | GS2 | GS1 |
|-------------|--|--|-----|--|--|-----|-----|-----|

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid after resetting

GS2 and GS1 are composed of the tool number combination

| GS2 | GS1 | Group | Tool number |
|-----|-----|-------|-------------|
| 0 | 0 | 1~16 | 1~16 |

| | | | |
|---|---|-------|-----|
| 0 | 1 | 1~32 | 1~8 |
| 1 | 0 | 1~64 | 1~4 |
| 1 | 1 | 1~128 | 1~2 |

LTM: Tool life

0: Specified by the usage times

1: Specified by time

EIS: When the tool life is measured based on time:

0: The life is counted every four seconds.

1: The life is counted every second.

| | | |
|-------------|---|---|
| 2710 | The omission number of tool life administration | 0 |
|-------------|---|---|

[Data type] Integrated

[Data range] 0~9999

[Valid mode] Valid after resetting

| | | |
|-------------|---------------------------------------|---|
| 2711 | M code for restarting tool life count | 0 |
|-------------|---------------------------------------|---|

[Data type] Integrated

[Data range] 0~255

[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 2712 | The rest of tool life (frequency of use) | 0 |
|-------------|--|---|

[Data type] Integrated

[Data range] 0~9999

[Valid mode] Valid after resetting

| | | |
|-------------|------------------------------------|---|
| 2713 | The rest of tool life (usage time) | 0 |
|-------------|------------------------------------|---|

[Data type] Integrated

[Data unit] min

[Data range] 0~9999

[Valid mode] Valid after resetting

4.12 Pitch Error Compensation Parameters (2800~2999)

| | | | | | | | | |
|-------------|----|----|----|----|----|----|------|------|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 2800 | | | | | | | WDIR | SCRW |

[Data type] Bit

[Data range] 0 or 1

[Default] 0 0 0 0 0 0 0 0

[Valid mode] Valid after resetting

SCRW: Pitch compensation

0: Not performed

1: Performed

WDIR: Pitch compensation selection

0: Unidirectional

1: Bidirectional

| | | |
|-------------|---|---|
| 2806 | The pitch error compensation value of the reference position return | 0 |
|-------------|---|---|

[Data type] Integral axis

[Data unit] Detection unit
[Data range] -32768 ~ 32767
[Valid mode] Valid after resetting

The pitch error compensation amount absolute value on the reference position is the backlash value of the reference position when the reference position return is operated in the negative direction and if the set direction (parameter ZMI<No.1004#5>) of the reference position return is positive; Or The pitch error compensation amount absolute value on the reference position is also the backlash value of the reference position when the reference position return is operated in the positive direction and if the set direction of the reference position return is negative. The backlash value is valid during the bidirectional pitch error compensating.

| | | |
|-------------|--|---|
| 2810 | Reference position pitch error compensation number for each axis | 0 |
|-------------|--|---|

[Data type] Integral axis
[Data range] 0~1023
[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 2811 | The farthest pitch error compensation point number for each axis in negative direction | 0 |
|-------------|--|---|

[Data type] Integral axis
[Data range] 0~1023
[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 2812 | The farthest pitch error compensation point number for each axis in positive direction | 0 |
|-------------|--|---|

[Data type] Integral axis
[Data range] 0~1023
[Valid mode] Valid after resetting

Remark:
 This parameter setting value is greater than that set by No.2810 (reference position pitch error compensation number).

| | | |
|-------------|---|---|
| 2813 | Pitch error compensation override for each axis | 1 |
|-------------|---|---|

[Data type] Real number axis
[Data unit] %
[Data range] 1~100
[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 2814 | The interval of pitch error compensation point for each axis | 0 |
|-------------|--|---|

[Data type] Real number axis
[Data unit] mm
[Data range] 0~999999.9999
[Valid mode] Valid after resetting

Remark:
 Pitch error compensation point is distributed in equidistant, the least value of interval = the maximum feedrate * (interpolation period/60000)* the compensation override.

Parameters

4.13 Turning cycle parameters (3000~3199)

| | | | | | | | | |
|-------------|--|--|--|--|--|--|--|------------|
| 3000 | | | | | | | | GMT |
|-------------|--|--|--|--|--|--|--|------------|

[Data type] Bit type
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after restarting

GMT: The system is when the power is ON
 0: Machining center
 1: Turning machine

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|------------|--|--|--|
| 3001 | | | | | DIA | | | |
|-------------|--|--|--|--|------------|--|--|--|

[Data type] Bit type
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

DIA: The commanded value of X axis is input in the program
 0: Diameter input
 1: Radius input

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|------------|--|-------------|--|------------|--|--|
| 3101 | | M5T | | MACT | | RTR | | |
|-------------|--|------------|--|-------------|--|------------|--|--|

[Data type] Bit type
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

RTR: Drilling cycle type
 0: Non-high-speed peck
 1: High-speed peck
MACT: Selecting function of G71-G7
 0: Multiple cycles in turning machine
 1: Grinding cycle of the grinding machine
M5T: Whether send the spindle stop command before M03/M04
 0: Not send
 1: Send

| | | | | | | | |
|-------------|--|--|--|--|--|--|--------|
| 3111 | Dwell time of the drilling cycle (G83 and G87) | | | | | | 0.0000 |
|-------------|--|--|--|--|--|--|--------|

[Data type] Real number axis type
 [Data unit] Second
 [Data range] 0~9999
 [Valid mode] Valid immediately

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|------------|------------|-------------|------------|--|------------|--|--|
| 3112 | M_T | R_T | U_PQ | TYP | | RTR | | |
|-------------|------------|------------|-------------|------------|--|------------|--|--|

[Data type] Bit type
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

Parameters

- RTR:** Drilling cycle type
 - 0: Non-peck drilling
 - 1: Peck drilling

- TYP:** Type of G71/G72 machining path
 - 0: Type I
 - 1: Type II

- U_PQ:** The unit is used when P/Q is commanded by G74/G75
 - 0: 0.001mm
 - 1: 1mm

- R_T:** G74/G75 return mode
 - 0: Not retraction 0 in the first layer
 - 1: Retraction 0 in the first layer

- M_T:** G74/G75 rapid/feeding retraction
 - 0: Rapid retraction
 - 1: Feeding retraction

| | | |
|-------------|---|--------|
| 3114 | Retraction distance during the drilling cycle (G83, G87) | 0.0000 |
|-------------|---|--------|

[Data type] Real number type
 [Data unit] 1 time
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 3130 | Chamfering amount (0.1* screw pitch) of the thread cutting cycle (G76,G92) | 0 |
|-------------|---|---|

[Data type] Integral type
 [Data unit] 0.1 time
 [Data range] 0~99
 [Valid mode] Valid immediately

| | | |
|-------------|--|-------|
| 3132 | Cutting amount of roughing cycle (G71,G72) | 0.001 |
|-------------|--|-------|

[Data type] Real number type
 [Data unit] mm
 [Data range] 0.001~99999.999
 [Valid mode] Valid immediately

| | | |
|-------------|---|--------|
| 3133 | Retraction amount of roughing cycle (G71,G72) | 0.0001 |
|-------------|---|--------|

[Data type] Real number type
 [Data unit] mm
 [Data range] 0.0001~99999.999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 3135 | Retraction amount in X axis direction of the closed cutting cycle (G73) | 0 |
|-------------|--|---|

[Data type] Real number type
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 3136 | Retraction amount in Z axis direction of the closed cutting cycle (G73) | 0 |
|-------------|--|---|

Parameters

[Data type] Real number type
 [Data unit] mm
 [Data range] -999999.9999~999999.9999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 3137 | Cutting times of the closed cutting cycle (G73) | 1 |
|-------------|---|---|

[Data type] Integrated type
 [Data unit] Frequency
 [Data range] 1~999999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 3139 | Retraction amount of multiple cycle (G74,G75) | 0 |
|-------------|---|---|

[Data type] Real number type
 [Data unit] mm
 [Data range] 0~99999.999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 3140 | Minimum cutting amount (0.001mm) of multiple thread cutting cycle G76 | 0 |
|-------------|---|---|

[Data type] Integrated type
 [Data unit] 0.001mm
 [Data range] 0~99999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 3141 | Finishing surplus (0.001mm) of multiple thread cutting cycle G76 | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data unit] 0.001mm
 [Data range] 0~99999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 3142 | Finishing cycle times of the multiple thread cutting cycle G76 | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data unit] Frequency
 [Data range] 1~99
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 3143 | Tool nose angle (deg) of the multiple thread cutting cycle G76 | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data unit] deg
 [Data range] 0~99
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 3144 | M codes switching into the machining center | 0 |
|-------------|---|---|

[Data type] Integrated type
 [Data range] 100~999
 [Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 3145 | M codes switching into the turning machine | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 100~999
 [Valid mode] Valid after resetting

4.14 Servo Parameters (4000~4999)

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 4000 | IGN8 | IGN7 | IGN6 | IGN5 | IGN4 | IGNZ | IGNY | IGNX |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

IGNn: The servo axis is:
 0: Not ignored
 1: Ignored

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|-------------|-------------|-------------|------------|------------|----|-------------|------------|
| 4001 | RAST | RDIR | DPOS | APC | APZ | | SADJ | LVP |

[Data type] Bit axis
 [Data range] 0 or 1
 [Default] 0 0 0 0 1 0 0 0
 [Valid mode] Valid immediately

LVP: Whether restore the default servo parameters
 0: Not restore
 1: Restore

Remark:
 When LVP is changed from “0” to “1”, the system reads the servo motor default parameters through the drive.

SADJ: Whether operate servo parameter self-regulation
 0: No
 1: Yes

Remark:
 When SADJ is changed from “0” into “1”, the system operates the servo parameters self-regulation. During self-regulating, the vibration will occur in the motor; for safety, the operator and the equipment must be out of the machine movement area.

APZ: Absolute encoder position and machine one are
 0: Not consistent
 1: Consistent

Remark:
 When the absolute encoder is used, it should be set as “0” when the system is powered on at the first time or zero position is lost; while the system automatically changes APZ from “0” to “1” after the manual reference position return is completed; or in Jog mode, when the axis is moved into the position to be set as zero, APZ is changed from “0” into “1”, the zero position is set manually, the absolute encoder zero is consistent with the machine zero.

Parameters

- APC: Whether select the pulse servo
 - 0: No
 - 1: Yes
- DPOS: The loop control of double positions is
 - 0: Invalid
 - 1: Valid
- RDIR: The direction of the optical grating is
 - 0: Positive
 - 1: Negative
- RAST: Whether use the optical grating
 - 0: No
 - 1: Yes

| | | | | | | | | |
|-------------|----|----|----|----|----|----|------|------|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 4002 | | | | | | | DPSS | PGTW |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

- PGTW: The position gain switch function is
 - 0: Invalid
 - 1: Valid
- DPSS: The double positions loop process mode is
 - 0: Type A
 - 1: Type B

| | | |
|-------------|--------------------------------------|-------|
| 4010 | Range of the servo multi-ring values | 65536 |
|-------------|--------------------------------------|-------|

[Data type] Integral axis
 [Data unit]
 [Data range] 0~1000000
 [Valid mode] Valid immediately

Remark:
 If the input parameter is 0, the system processes as 65536.

| | | |
|-------------|--------------------------------------|--------|
| 4011 | Range of the servo single ring value | 131072 |
|-------------|--------------------------------------|--------|

[Data type] Integral axis
 [Data range] 0~1000000
 [Valid mode] Valid immediately

Remark:
 If the input parameter is 0, the system processes as 131072.

| | | |
|-------------|---|---|
| 4013 | Valid speed of the position gain switch | 0 |
|-------------|---|---|

[Data type] Integral axis
 [Data unit] rpm
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4016 | Time constant of one time dwell in the double positions loop | 300 |
|-------------|--|-----|

[Data type] Integral axis

[Data unit] ms
 [Data range] 0~1000
 [Valid mode] Valid immediately

7# 6# 5# 4# 3# 2# 1# 0#

| | | | | | | | | |
|-------------|--|--|--|--|--|--|------------|------------|
| 4020 | | | | | | | ADJ | SYN |
|-------------|--|--|--|--|--|--|------------|------------|

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

SYN: The feed axis synchronous symbol is
 0: Invalid
 1: Valid
 ADJ: Whether the feed axis synchronously is corrected
 0: Not correct
 1: Correct

| | | |
|-------------|--------------------------|---|
| 4021 | Main control axis number | 0 |
|-------------|--------------------------|---|

[Data type] Integral axis
 [Data unit]
 [Data range] 0~6
 [Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 4022 | Allowable synchronous error amount of the machine coordinate | 0 |
|-------------|--|---|

[Data type] Integral axis
 [Data unit] 0.1um
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4023 | Allowable synchronous error amount of the position offset | 0 |
|-------------|---|---|

[Data type] Integral axis
 [Data unit] 0.1um
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4024 | Allowable compensation amount of the synchronous adjustment | 0 |
|-------------|---|---|

[Data type] Integral axis
 [Data unit] 0.1um
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4025 | Allowable error amount of the synchronous torque | 0 |
|-------------|--|---|

[Data type] Integral axis
 [Data unit] 10mA
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4026 | Compensation zero range of the synchronous error | 0 |
|-------------|--|---|

[Data type] Integral axis
 [Data unit] 0.1um

Parameters

[Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4027 | Compensation gain of the synchronous error | 1 |
|-------------|--|---|

[Data type] Integral axis
 [Data unit]
 [Data range] 1~1024
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------|------|
| 4100 | Each axis pulse equivalent | 1000 |
|-------------|----------------------------|------|

[Data type] Real number axis
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|--------------------------------|-----|
| 4110 | In-position width of each axis | 100 |
|-------------|--------------------------------|-----|

[Data type] Integral axis
 [Data unit] 0.1um
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 4111 | The maximum allowable position offset amount when each axis is stopped | 1000 |
|-------------|--|------|

[Data type] Real number axis
 [Data unit] 0.1um
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|--------|
| 4112 | The max. allowable position offset amount when each axis moves | 120000 |
|-------------|--|--------|

[Data type] Integral axis
 [Data unit] 0.1um
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|---|
| 4114 | Incremental grating signal period | 0 |
|-------------|-----------------------------------|---|

[Data type] Integrated axis type
 [Data unit] 0.1um
 [Data range] 0~1000
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4115 | The allowable max. coordinate differential value between the optical grating and the servo encoder | 0 |
|-------------|--|---|

[Data type] Integral axis
 [Data unit] 0.1um
 [Data range] 0~999999
 [Valid mode] Valid immediately

Remark:

1. When it is set as 0, the coordinate differential value is not detected.
2. During debugging and running the machine with the optical grating, it is recommended to use the default value detection function to realize the protection in the abnormal situation.

| | | |
|-------------|--|---|
| 4116 | Vibration control differential value between the optical grating and the servo encoder | 0 |
|-------------|--|---|

[Data type] Integral axis

[Data unit] 0.1um

[Data range] 0~999999

[Valid mode] Valid immediately

Remark:

1. The vibration control isn't operated when it is set as 0.
2. It is valid during debugging the axis with the optical grating and it is used when the machine is vibrated seriously.
3. In the set range, it is controlled in the fully closed loop; out of the range, it is in the semi-closed loop control.

| | | |
|-------------|---------------------------------|---|
| 4120 | Offset amount of each axis grid | 0 |
|-------------|---------------------------------|---|

[Data type] Real number axis

[Data unit] mm

[Data range] 0~10000

[Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 4121 | Backlash compensating value for each axis | 0 |
|-------------|---|---|

[Data type] Real number axis

[Data unit] mm

[Data range] -9.9999~9.9999

[Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 4122 | Backlash compensating value in rapid traverse rate for each axis | 0 |
|-------------|--|---|

[Data type] Real number axis

[Data unit] mm

[Data range] -9.9999~9.9999

[Valid mode] Valid after resetting

| | | |
|-------------|-------------------------------------|------|
| 4123 | Step width of backlash compensation | 0.01 |
|-------------|-------------------------------------|------|

[Data type] Real number axis

[Data unit] mm

[Data range] 0~0.9999

[Valid mode] Valid after resetting

| | | |
|-------------|----------|-----|
| 4200 | Password | 315 |
|-------------|----------|-----|

[Data type] Integral number axis

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|-----------------|----|
| 4201 | Motor type code | 65 |
|-------------|-----------------|----|

[Data type] Integral number axis

[Data range] 0~100

[Valid mode] Valid immediately

| | | |
|-------------|----------------|-----|
| 4202 | Version number | 420 |
|-------------|----------------|-----|

[Data type] Integral number axis

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|-----------------------|---|
| 4203 | Initial display state | 0 |
|-------------|-----------------------|---|

[Data type] Integral number axis
 [Data range] 0~21
 [Valid mode] Valid immediately

| | | |
|-------------|------------------------|---|
| 4204 | Control mode selection | 0 |
|-------------|------------------------|---|

[Data type] Integral number axis
 [Data range] 0~7
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------|-----|
| 4205 | Speed proportional gain | 155 |
|-------------|-------------------------|-----|

[Data type] Integral number axis
 [Data unit] 0.1
 [Data range] 5~1280
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|-----|
| 4206 | Speed integration time constant (ms) | 200 |
|-------------|--------------------------------------|-----|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------|-----|
| 4207 | Torque command filter (%) | 100 |
|-------------|---------------------------|-----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 40~2000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|----|
| 4208 | Speed check low-pass filter (%) | 40 |
|-------------|---------------------------------|----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 10~2000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------|-----|
| 4209 | Position proportional gain | 245 |
|-------------|----------------------------|-----|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~2000
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|---|
| 4210 | Position feed forward gain (%) | 0 |
|-------------|--------------------------------|---|

[Data type] Integral number axis
 [Data unit] 0.1
 [Data range] 0~1280
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4211 | Position feed forward low-pass end rate (Hz) | 300 |
|-------------|--|-----|

[Data type] Integral number axis
 [Data unit] Hz
 [Data range] 1~2000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------------------|------|
| 4212 | Electron gear rate numerator | 8192 |
|-------------|------------------------------|------|

[Data type] Integral number axis

[Data range] 1~999999
 [Valid mode] Valid immediately

| | | |
|------|--------------------------------|------|
| 4213 | Electron gear rate denominator | 5000 |
|------|--------------------------------|------|

[Data type] Integral number axis
 [Data range] 1~999999
 [Valid mode] Valid immediately

| | | |
|------|---------------------------|---|
| 4214 | Position pulse input mode | 0 |
|------|---------------------------|---|

[Data type] Integral number axis
 [Data range] 0~2
 [Valid mode] Valid immediately

| | | |
|------|--------------------------|---|
| 4215 | Position pulse direction | 0 |
|------|--------------------------|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

Remark:
 After rewriting the parameter, the system machine coordinate and the absolute coordinate values will be directly negated, calculated and displayed.

| | | |
|------|-------------------------------------|----|
| 4216 | The completion range of positioning | 20 |
|------|-------------------------------------|----|

[Data type] Integral number axis
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|------|---|------|
| 4217 | Position dynamic excess-error check range | 3000 |
|------|---|------|

[Data type] Integral number axis
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|------|--|---|
| 4218 | Position excess-error check is enabled | 0 |
|------|--|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|------|---------------------------------------|-----|
| 4219 | Differential proportional coefficient | 100 |
|------|---------------------------------------|-----|

[Data type] Integral number axis
 [Data unit] Hz
 [Data range] 15~15000
 [Valid mode] Valid immediately

| | | |
|------|---------------------------|---|
| 4220 | Invalid drive forbiddance | 0 |
|------|---------------------------|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|------|-----------|-----|
| 4221 | JOG speed | 100 |
|------|-----------|-----|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] -6000~6000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|---|
| 4222 | The speed command filter switch | 0 |
|-------------|---------------------------------|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------|------|
| 4223 | The maximum speed limit | 3000 |
|-------------|-------------------------|------|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] 0~6000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|---|
| 4224 | Internal speed 1 | 0 |
|-------------|------------------|---|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] -6000~6000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|-----|
| 4225 | Internal speed 2 | 100 |
|-------------|------------------|-----|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] -6000~6000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|-----|
| 4226 | Internal speed 3 | 300 |
|-------------|------------------|-----|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] -6000~6000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|------|
| 4227 | Internal speed 4 | -100 |
|-------------|------------------|------|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] -6000~6000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------|-----|
| 4228 | Arrival speed | 500 |
|-------------|---------------|-----|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] 0~6000
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4229 | The 2 nd integration time constant of speed | 300 |
|-------------|--|-----|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|----|
| 4230 | Linear speed conversion numerator | 10 |
|-------------|-----------------------------------|----|

[Data type] Integral number axis
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------------|---|
| 4231 | Linear speed conversion denominator | 1 |
|-------------|-------------------------------------|---|

[Data type] Integral number axis
 [Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|-------------------------------------|---|
| 4232 | Linear speed decimal point position | 3 |
|-------------|-------------------------------------|---|

[Data type] Integral number axis

[Data range] 0~4

[Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|-----|
| 4233 | The speed in the mode of motor check | 100 |
|-------------|--------------------------------------|-----|

[Data type] Integral number axis

[Data unit] rpm

[Data range] 0~6000

[Valid mode] Valid immediately

| | | |
|-------------|-------------------------------|-----|
| 4234 | The internal CCW torque limit | 300 |
|-------------|-------------------------------|-----|

[Data type] Integral number axis

[Data unit] %

[Data range] 0~300

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------|------|
| 4235 | The internal CW torque limit | -300 |
|-------------|------------------------------|------|

[Data type] Integral number axis

[Data unit] %

[Data range] -300~0

[Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|-----|
| 4238 | Speed trial running torque limit | 100 |
|-------------|----------------------------------|-----|

[Data type] Integral number axis

[Data unit] %

[Data range] 0~300

[Valid mode] Valid immediately

| | | |
|-------------|----------------------|---|
| 4239 | Acceleration time ms | 0 |
|-------------|----------------------|---|

[Data type] Integral number axis

[Data unit] ms

[Data range] 0~10000

[Valid mode] Valid immediately

| | | |
|-------------|----------------------|---|
| 4240 | Deceleration time ms | 0 |
|-------------|----------------------|---|

[Data type] Integral number axis

[Data unit] ms

[Data range] 0~10000

[Valid mode] Valid immediately

| | | |
|-------------|---------------------------|---|
| 4241 | Servo output pulse number | 0 |
|-------------|---------------------------|---|

[Data type] Integral number axis

[Data unit] P/r

[Data range] 16~32767

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------|-----|
| 4242 | Servo response top frequency | 200 |
|-------------|------------------------------|-----|

[Data type] Integral number axis

[Data unit] Hz

[Data range] 50~600

[Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4243 | Speed from the internal or the external | 1 |
|-------------|---|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 4244 | Parameter self-regulating current input | 30 |
|-------------|---|----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 1~2000
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4245 | The robot anti-collision current filtering time | 5 |
|-------------|---|---|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4246 | Analog command and pulse output are negated | 0 |
|-------------|---|---|

[Data type] Integral number axis
 [Data range] 0~3
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------|------|
| 4247 | Speed command gain | 1000 |
|-------------|--------------------|------|

[Data type] Integral number axis
 [Data unit] 0.001ms
 [Data range] 20~3000
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4249 | The robot collision position feedback excess-error detection | 4 |
|-------------|--|---|

[Data type] Integral number axis
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4250 | The robot static collision current detection | 6 |
|-------------|--|---|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 4251 | The robot dynamic collision current detection coefficient | 150 |
|-------------|---|-----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 4252 | Parameter self-regulating current limit value | 40 |
|-------------|---|----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 1~100
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 4253 | Parameter self-regulating speed low-pass filter end frequency | 65 |
|-------------|---|----|

[Data type] Integral number axis
 [Data unit] Hz
 [Data range] 10~2000
 [Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 4254 | Speed command abnormal detection valve value | 1000 |
|-------------|--|------|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~3000
 [Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 4255 | Feedback speed abnormal detection valve value | 1000 |
|-------------|---|------|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~3000
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 4256 | The output time is performed in advance when the feedback pulse is greater than 10000 | 20 |
|-------------|---|----|

[Data type] Integral number axis
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|---|
| 4257 | Speed command feed forward gain | 0 |
|-------------|---------------------------------|---|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4258 | Acceleration command feed forward gain | 0 |
|-------------|--|---|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] -10000~10000
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|---|
| 4259 | Inertia stop decay coefficient | 2 |
|-------------|--------------------------------|---|

[Data type] Integral number axis
 [Data range] 1~4
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------|------|
| 4260 | Current proportional gain | 1450 |
|-------------|---------------------------|------|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~6000
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|-----|
| 4261 | Current integration time constant | 130 |
|-------------|-----------------------------------|-----|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|----|
| 4262 | Current integration separation point | 25 |
|-------------|--------------------------------------|----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 0~500
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4263 | Current proportion gain rate of change | 200 |
|-------------|--|-----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 0~500
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------|------|
| 4264 | Current low-pass end rate | 1000 |
|-------------|---------------------------|------|

[Data type] Integral number axis
 [Data unit] Hz
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------------------------|-----|
| 4265 | Speed integration separation point | 100 |
|-------------|------------------------------------|-----|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] 0~3000
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|-----|
| 4266 | Speed proportion gain rate of change | 100 |
|-------------|--------------------------------------|-----|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 0~500
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------|------|
| 4267 | Deviated position corner 0 | 1000 |
|-------------|----------------------------|------|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 100~2000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------|------|
| 4268 | Deviated position corner 1 | 1000 |
|-------------|----------------------------|------|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 100~2000
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4269 | The position proportional gain change rate of deviated position corner 0 | 950 |
|-------------|--|-----|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 100~1000
 [Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 4270 | The position proportional gain change rate of deviated position corner 1 | 1700 |
|-------------|--|------|

[Data type] Integral number axis
 [Data unit] 0.1
 [Data range] 1000~3100
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------|-----|
| 4271 | Motor rotor inertia | 133 |
|-------------|---------------------|-----|

[Data type] Integral number axis

[Data unit] 0.01

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|--------------------|----|
| 4272 | Motor rated torque | 60 |
|-------------|--------------------|----|

[Data type] Integral number axis

[Data unit] 0.1

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|-----------------------------|------|
| 4273 | Motor rated revolving speed | 2500 |
|-------------|-----------------------------|------|

[Data type] Integral number axis

[Data unit] rpm

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 4274 | The allowable maximum current of current sampling circuit | 2500 |
|-------------|---|------|

[Data type] Integral number axis

[Data unit] 0.01

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|---------------------|----|
| 4275 | Motor rated current | 60 |
|-------------|---------------------|----|

[Data type] Integral number axis

[Data unit] 0.01

[Data range] 0~1000

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4276 | The motor allowable maximum overload times | 200 |
|-------------|--|-----|

[Data type] Integral number axis

[Data unit] %

[Data range] 0~1000

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4277 | Correction coefficient of q axis current | 200 |
|-------------|--|-----|

[Data type] Integral number axis

[Data unit] 0.001

[Data range] 0~1000

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4278 | Correction coefficient of d axis current | 200 |
|-------------|--|-----|

[Data type] Integral number axis

[Data unit] 0.001

[Data range] 0~1000

[Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 4279 | The allowable repeated maximum regulating time during the parameter self-regulation | 1000 |
|-------------|---|------|

[Data type] Integral number axis

[Data range] 0~30000

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 4280 | The 2 nd integration time constant of current | 500 |
|-------------|--|-----|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------------|-----|
| 4281 | Correction coefficient of speed PID | 500 |
|-------------|-------------------------------------|-----|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~1000
 [Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 4282 | Current proportion gain during the parameter self-regulating | 3000 |
|-------------|--|------|

[Data type] Integral number axis
 [Data unit] 0.001
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4283 | Dwell time of the main circuit overvoltage alarm | 1 |
|-------------|--|---|

[Data type] Integral number axis
 [Data unit] s
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 4284 | Dwell time of the main circuit brake alarm | 1 |
|-------------|--|---|

[Data type] Integral number axis
 [Data unit] s
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|-----|
| 4285 | Dwell time of the drive enable | 150 |
|-------------|--------------------------------|-----|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|----|
| 4286 | Dwell time of the module alarm | 80 |
|-------------|--------------------------------|----|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 4287 | Dwell time of the main circuit less voltage alarm | 10 |
|-------------|---|----|

[Data type] Integral number axis
 [Data unit] 0.1s
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4288 | The communication error counter of absolute encoder | 2 |
|-------------|---|---|

[Data type] Integral number axis
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 4289 | The longest time of completing the encoder set to 0 | 3000 |
|-------------|---|------|

[Data type] Integral number axis

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4290 | The position loop received data are the incremental position or the absolute position | 0 |
|-------------|---|---|

[Data type] Integral number axis

[Data range] 0~1

[Valid mode] Valid immediately

| | | |
|-------------|----------------------|---|
| 4291 | Encoder control mode | 2 |
|-------------|----------------------|---|

[Data type] Integral number axis

[Data range] 0~20

[Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 4292 | Speed gain switching value at low speed | 100 |
|-------------|---|-----|

[Data type] Integral number axis

[Data unit] rpm

[Data range] 0~3000

[Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 4293 | Speed gain switching coefficient at low speed | 100 |
|-------------|---|-----|

[Data type] Integral number axis

[Data unit] %

[Data range] 0~300

[Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|-------|
| 4294 | Servo alarm display time in turn | 15000 |
|-------------|----------------------------------|-------|

[Data type] Integral number axis

[Data unit] 0.1ms

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|------------------|---|
| 4295 | Pole pair number | 4 |
|-------------|------------------|---|

[Data type] Integral number axis

[Data range] 0~8

[Valid mode] Valid immediately

| | | |
|-------------|-------------------------------|------|
| 4296 | Opened-loop operation voltage | 1395 |
|-------------|-------------------------------|------|

[Data type] Integral number axis

[Data unit] 0.01V

[Data range] 0~31000

[Valid mode] Valid immediately

| | | |
|-------------|-----------------------------|----|
| 4297 | Opened-loop operation speed | 18 |
|-------------|-----------------------------|----|

[Data type] Integral number axis

[Data unit] rpm

[Data range] 0~3000

[Valid mode] Valid immediately

| | | |
|-------------|--------------------------|---|
| 4298 | SON enforcement is valid | 0 |
|-------------|--------------------------|---|

[Data type] Integral number axis

[Data range] 0~1

[Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 4299 | The voltage value when the encoder is set to 0 | 4000 |
|-------------|--|------|

[Data type] Integral number axis

[Data unit] 0.01V

[Data range] 0~31000

[Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|------|
| 4300 | Dwell time of the battery alarm | 1000 |
|-------------|---------------------------------|------|

[Data type] Integral number axis

[Data unit] 0.1ms

[Data range] 0~3000

[Valid mode] Valid immediately

| | | |
|-------------|--|----|
| 4301 | The parameter self-regulating speed of the filter low-pass end frequency 2 | 80 |
|-------------|--|----|

[Data type] Integral number axis

[Data unit] Hz

[Data range] 1~32767

[Valid mode] Valid immediately

| | | |
|-------------|--|----|
| 4302 | The adjustable pulse width output by Z pulse | 30 |
|-------------|--|----|

[Data type] Integral number axis

[Data unit] 0.1ms

[Data range] 0~10000

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------------|---|
| 4303 | Start the robot hit-proof function | 0 |
|-------------|------------------------------------|---|

[Data type] Integral number axis

[Data range] 0~1

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------|-----|
| 4304 | Speed filter end frequency 0 | 100 |
|-------------|------------------------------|-----|

[Data type] Integral number axis

[Data unit] Hz

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------|-----|
| 4305 | Speed filter end frequency 1 | 110 |
|-------------|------------------------------|-----|

[Data type] Integral number axis

[Data unit] Hz

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------|-----|
| 4306 | Speed filter end frequency 2 | 130 |
|-------------|------------------------------|-----|

[Data type] Integral number axis

[Data unit] Hz

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------|-----|
| 4307 | Speed filter end frequency 3 | 170 |
|-------------|------------------------------|-----|

[Data type] Integral number axis

[Data unit] Hz

[Data range] 0~32767

[Valid mode] Valid immediately

| | | |
|-------------|-----------------------------|---|
| 4308 | Inertia stop mode selection | 1 |
|-------------|-----------------------------|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|---|
| 4309 | Speed filter wave separation point 0 | 3 |
|-------------|--------------------------------------|---|

[Data type] Integral number axis
 [Data unit] rpm
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|----|
| 4310 | Speed filter wave separation point 1 | 10 |
|-------------|--------------------------------------|----|

[Data type] Integral number axis
 [Data unit] r/min
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|----|
| 4311 | Speed filter wave separation point 2 | 35 |
|-------------|--------------------------------------|----|

[Data type] Integral number axis
 [Data unit] r/min
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|---|
| 4312 | Shield the motor type wrong alarm | 0 |
|-------------|-----------------------------------|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4313 | Start the band-type brake stop function | 1 |
|-------------|---|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------|---|
| 4314 | Over-current alarm delay time | 1 |
|-------------|-------------------------------|---|

[Data type] Integral number axis
 [Data unit] 0.5ms
 [Data range] 0~200
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 4315 | Dwell time of valid detection of power-on band-type brake on | 1 |
|-------------|---|---|

[Data type] Integral number axis
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|------|
| 4317 | Delay time of band-type brake on | 1500 |
|-------------|----------------------------------|------|

[Data type] Integral number axis
 [Data unit] 0.1ms
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------|-------|
| 4318 | Band-type brake delay time | 10000 |
|-------------|----------------------------|-------|

[Data type] Integral number axis
 [Data unit] 0.1ms

[Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|---|
| 4320 | Speed display error compensation | 4 |
|-------------|----------------------------------|---|

[Data type] Integral number axis
 [Data range] 0~32767
 [Valid mode] Valid immediately

4.15 Spindle Control Parameters (5000~5999)

| | | | | | | | | |
|-------------|--------------|------------|----|----|----|-------------|------------|------------|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 5000 | LOOPS | GTT | | | | ALMS | SWG | SAR |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 1 1 0
 [Valid mode] Valid after resetting

- SAR: The spindle speed arrival signal is:
 0: Not checked
 1: Checked
- SWG: Spindle alarm switch
 0: Ignored
 1: Accepted and processed
- ALMS: Spindle alarm valid level
 0: Low level
 1: High level
- GTT: Spindle gear shifting mode selection
 0: M type
 1: T type
- LOOPS: Spindle position control mode selection
 0: Opened-loop
 1: Closed-loop

| | | | | | | | | |
|-------------|----|----|----|----|-------------|----|----|------------|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 5001 | | | | | SVAL | | | SVD |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid immediately

- SVD: Spindle speed fluctuation detection
 0: Invalid
 1: Valid
- SVAL: Spindle speed display selection
 0: Commanded speed
 1: Actual speed

| | | | | | | | | |
|-------------|----|----|----|----|----|----|------------|------------|
| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
| 5002 | | | | | | | SCS | AXC |

[Data type] Bit type
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

SCS: Cs axis function
 0: Invalid
 1: Valid
AXC: Spindle positioning function
 0: Invalid
 1: Valid

| | | |
|-------------|--------------|---|
| 5008 | Spindle name | 0 |
|-------------|--------------|---|

[Data type] Integrated type
 [Data range] 0~255
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 5010 | Set the spindle speed range during starting the spindle speed fluctuation detecting | 2 |
|-------------|---|---|

[Data type] Integral number axis
 [Data unit] %
 [Data range] 1~100
 [Valid mode] Valid immediately

| | | |
|-------------|---|----|
| 5011 | The allowable spindle speed fluctuation rate during the spindle speed fluctuation detecting | 10 |
|-------------|---|----|

[Data type] Integrated type
 [Data unit] %
 [Data range] 1~100
 [Valid mode] Valid immediately

| | | |
|-------------|--|------|
| 5012 | The allowable spindle speed fluctuation value during the spindle speed fluctuation detecting | 1000 |
|-------------|--|------|

[Data type] Integrated type
 [Data unit] rpm
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 5013 | Time from the spindle speed command change to the spindle speed fluctuation detection start | 2000 |
|-------------|---|------|

[Data type] Integrated type
 [Data unit] ms
 [Data range] 0~999999
 [Valid mode] Valid immediately

| | | |
|-------------|---|-------|
| 5100 | The gain regulation data (0.01%) of spindle speed analog output | 10000 |
|-------------|---|-------|

[Data type] Integrated type
 [Data unit] 0.01%
 [Data range] 1000~12500
 [Valid mode] Valid after resetting

Set value=10/the real-time measured output analog voltage value during commanding the spindle max. speed * 10000

| | | |
|-------------|--|---|
| 5101 | The compensation value of spindle speed analog output offset voltage | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] -1024~1024
 [Valid mode] Valid after resetting

Set zero floating compensation value of the spindle speed command analog voltage.

| | | |
|-------------|----------------------|------|
| 5102 | Spindle acceleration | 2222 |
|-------------|----------------------|------|

[Data type] Real number
 [Data unit] rev/(second * second)
 [Data range] 0~99999
 [Valid mode] Valid after resetting

| | | |
|-------------|---------------------------------|---|
| 5103 | Spindle analog output direction | 0 |
|-------------|---------------------------------|---|

[Data type] Integrated type
 [Data range] 0~1(0: Positive, 1: Negative)
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-----|
| 5105 | The spindle maximum acceleration in rigid tapping | 139 |
|-------------|---|-----|

[Data type] Real number
 [Data unit] rev/(second * second)
 [Data range] 0~99999
 [Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 5106 | The direction control of closed-loop spindle | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 0~3
 [Valid mode] Valid after resetting

| Setting value | Command direction | Feedback direction |
|---------------|-------------------|--------------------|
| 0 | 1 | 1 |
| 1 | -1 | -1 |
| 2 | 1 | -1 |
| 3 | -1 | 1 |

| | | |
|-------------|---|------|
| 5108 | Pulse number per revolution of the position encoder | 4096 |
|-------------|---|------|

[Data type] Integrated type
 [Data unit] Detection unit
 [Data range] 1~32767
 [Valid mode] Valid after resetting

| | | |
|-------------|---|-----|
| 5110 | The motor revolving speed when the spindle gear shifting is performed | 100 |
|-------------|---|-----|

[Data type] Integrated type
 [Data unit] r/min
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|---|----|
| 5113 | Time of checking the spindle speed arrival signal | 64 |
|-------------|---|----|

[Data type] Integrated type
 [Data unit] ms
 [Data range] 0~255
 [Valid mode] Valid after resetting

| | | |
|-------------|---------------------------|------|
| 5114 | The spindle default speed | 1000 |
|-------------|---------------------------|------|

[Data type] Integrated type
 [Data unit] rpm

[Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 5115 | The spindle motor top revolving speed corresponding to 10V | 6000 |
|-------------|--|------|

[Data type] Integrated type
 [Data unit] rev/min
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|---------------------------|------|
| 5116 | Spindle speed upper limit | 6000 |
|-------------|---------------------------|------|

[Data type] Integrated type
 [Data unit] rev/min
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|----------------------------|-----|
| 5118 | Spindle safety limit speed | 100 |
|-------------|----------------------------|-----|

[Data type] Real number
 [Data unit] rev/min
 [Data range] 0~6000
 [Valid mode] Valid after resetting

Remark:
 The spindle top speed is set when G033#4 SVL of PLC signal is set as "1".

| | | |
|-------------|-------------------------------------|------|
| 5120 | The spindle maximum speed of gear 1 | 6000 |
|-------------|-------------------------------------|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|-------------------------------------|------|
| 5121 | The spindle maximum speed of gear 2 | 6000 |
|-------------|-------------------------------------|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|-------------------------------------|------|
| 5122 | The spindle maximum speed of gear 3 | 6000 |
|-------------|-------------------------------------|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|-------------------------------------|------|
| 5123 | The spindle maximum speed of gear 4 | 6000 |
|-------------|-------------------------------------|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 5130 | Spindle speed shift point of gears 1 and 2 | 1500 |
|-------------|--|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

Parameters

| | | |
|-------------|--|------|
| 5131 | Spindle speed shift point of gears 2 and 3 | 3000 |
|-------------|--|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 5135 | Spindle speed shift point of gears 1 and 2 when the tapping cycle is performed | 1500 |
|-------------|--|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|--|------|
| 5136 | Spindle speed shift point of gears 2 and 3 when the tapping cycle is performed | 2000 |
|-------------|--|------|

[Data type] Real number
 [Data unit] rpm
 [Data range] 0~100000
 [Valid mode] Valid after resetting

| | | |
|-------------|----------------------------------|---|
| 5160 | Spindle low gear ratio numerator | 1 |
|-------------|----------------------------------|---|

[Data type] Integral number
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|-------------------------------------|---|
| 5161 | Spindle middle gear ratio numerator | 1 |
|-------------|-------------------------------------|---|

[Data type] Integral number
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|-----------------------------------|---|
| 5162 | Spindle high gear ratio numerator | 1 |
|-------------|-----------------------------------|---|

[Data type] Integral number
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|------------------------------------|---|
| 5163 | Spindle low gear ratio denominator | 1 |
|-------------|------------------------------------|---|

[Data type] Integral number
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|-------------------------------------|---|
| 5165 | Spindle high gear ratio denominator | 1 |
|-------------|-------------------------------------|---|

[Data type] Integral number
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 5166 | Spindle middle-low gear ratio denominator | 1 |
|-------------|---|---|

[Data type] Integral number
 [Data range] 1~999999
 [Valid mode] Valid after resetting

| | | |
|-------------|--|---|
| 5167 | Spindle middle-high gear ratio denominator | 1 |
|-------------|--|---|

[Data type] Integral number
 [Data range] 1~999999

[Valid mode] Valid after resetting

| | | |
|-------------|---|---|
| 5168 | Spindle high-speed gear ratio denominator | 1 |
|-------------|---|---|

[Data type] Integral number

[Data range] 1~999999

[Valid mode] Valid after resetting

| | | |
|-------------|--|-----|
| 5200 | The 1 st gear position loop gain controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5201 | The 2 nd gear position loop gain controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5202 | The 3 rd gear position loop gain controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5203 | The 4 th gear position loop gain controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5210 | The interpolation servo axis number (the 1 st group) controlled by Cs spindle | 0 |
|-------------|--|---|

[Data type] Integrated type

[Data range] 0~8

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5211 | The 1 st gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5212 | The 2 nd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5213 | The 3 rd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type

[Data range] 0~9999

[Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5214 | The 4 th gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5220 | The interpolation servo axis number (the 2 nd group) controlled by Cs spindle | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 0~8
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5221 | The 1 st gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5222 | The 2 nd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5223 | The 3 rd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5224 | The 4 th gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5230 | The interpolation servo axis number (the 3 rd group) controlled by Cs spindle | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 0~8
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5231 | The 1 st gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5232 | The 2 nd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5233 | The 3 rd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5234 | The 4 th gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5240 | The interpolation servo axis number (the 4 th group) controlled by Cs spindle | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 0~8
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5241 | The 1 st gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5242 | The 2 nd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5243 | The 3 rd gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5244 | The 4 th gear position loop gain of the interpolation servo axis controlled by Cs spindle | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5250 | The 1 st gear position gain in the spindle positioning mode | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5251 | The 2 nd gear position gain in the spindle positioning mode | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5252 | The 3 rd gear position gain in the spindle positioning mode | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5253 | The 4 th gear position gain in the spindle positioning mode | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|-----|
| 5300 | Spindle password | 510 |
|-------------|------------------|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|-----------|----|
| 5301 | Type code | 10 |
|-------------|-----------|----|

[Data type] Integrated type
 [Data range] 0~80
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|-----|
| 5302 | Software version | 400 |
|-------------|------------------|-----|

[Data type] Integrated type
 [Data range] 0~999
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------|---|
| 5303 | Initial display state | 0 |
|-------------|-----------------------|---|

[Data type] Integrated type
 [Data range] 0~20
 [Valid mode] Valid immediately

| | | |
|-------------|------------------------|---|
| 5304 | Control mode selection | 1 |
|-------------|------------------------|---|

[Data type] Integrated type
 [Data range] 0~5
 [Valid mode] Valid immediately

| | | |
|-------------|---|------|
| 5305 | The 1 st speed proportion gain | 1500 |
|-------------|---|------|

[Data type] Integrated type
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|----|
| 5306 | Speed integral time constant (ms) | 20 |
|-------------|-----------------------------------|----|

[Data type] Integrated type
 [Data range] 1~1000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------|-----|
| 5307 | Torque command filtration (%) | 100 |
|-------------|-------------------------------|-----|

[Data type] Integrated type
 [Data range] 1~500
 [Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 5308 | Speed detection low-pass filtration (%) | 100 |
|-------------|---|-----|

[Data type] Integrated type
 [Data range] 1~500
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------|----|
| 5309 | Position proportion gain | 40 |
|-------------|--------------------------|----|

[Data type] Integrated type
 [Data range] 1~1000
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|---|
| 5310 | Position feed forward gain (%) | 0 |
|-------------|--------------------------------|---|

[Data type] Integrated type
 [Data range] 0~100
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5311 | Position feed forward low-pass end rate (HZ) | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 1~1200
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|---|
| 5312 | Electronic gear ratio numerator | 1 |
|-------------|---------------------------------|---|

[Data type] Integrated type
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|---|
| 5313 | Electronic gear ratio denominator | 1 |
|-------------|-----------------------------------|---|

[Data type] Integrated type
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5314 | Reserved | 0 |
|-------------|----------|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------|---|
| 5315 | Position pulse direction | 0 |
|-------------|--------------------------|---|

[Data type] Integrated type
 [Data range] 0~3
 [Valid mode] Valid immediately

| | | |
|-------------|----------|----|
| 5316 | Reserved | 20 |
|-------------|----------|----|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------------|-----|
| 5317 | Position excess-error detection range | 200 |
|-------------|---------------------------------------|-----|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 5318 | Position excess-error detection invalid | 0 |
|-------------|---|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|---|
| 5319 | Position command smooth filter | 0 |
|-------------|--------------------------------|---|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------|---|
| 5320 | Drive forbid invalid | 0 |
|-------------|----------------------|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--------------|-----|
| 5321 | JOG feedrate | 120 |
|-------------|--------------|-----|

[Data type] Integrated type
 [Data range] -6000~6000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------|---|
| 5322 | Enable delay (ms) | 0 |
|-------------|-------------------|---|

[Data type] Integrated type
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|-------|
| 5323 | Max. speed limit | 10000 |
|-------------|------------------|-------|

[Data type] Integrated type
 [Data range] 0~ 12000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5324 | Reserved | 0 |
|-------------|----------|---|

[Data type] Integrated type
 [Data range] -6000~ 6000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|-----|
| 5325 | Reserved | 100 |
|-------------|----------|-----|

[Data type] Integrated type
 [Data range] -6000~ 6000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|-----|
| 5326 | Reserved | 300 |
|-------------|----------|-----|

[Data type] Integrated type
 [Data range] -6000~ 6000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|------|
| 5327 | Reserved | -100 |
|-------------|----------|------|

[Data type] Integrated type
 [Data range] -6000~ 6000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------|-----|
| 5328 | Speed arrival range | 500 |
|-------------|---------------------|-----|

[Data type] Integrated type
 [Data range] 0~ 6000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------|-----|
| 5328 | Speed arrival range | 500 |
|-------------|---------------------|-----|

[Data type] Integrated type
 [Data range] 0~6000

[Valid mode] Valid immediately

| | | |
|-------------|----------|-----|
| 5329 | Reserved | 300 |
|-------------|----------|-----|

[Data type] Integrated type

[Data range] 1~32767

[Valid mode] Valid immediately

| | | |
|-------------|-----------------------------------|-----|
| 5330 | Internal CW rotation torque limit | 400 |
|-------------|-----------------------------------|-----|

[Data type] Integrated type

[Data range] 0~400

[Valid mode] Valid immediately

| | | |
|-------------|------------------------------------|------|
| 5331 | Internal CCW rotation torque limit | -400 |
|-------------|------------------------------------|------|

[Data type] Integrated type

[Data range] -400~0

[Valid mode] Valid immediately

| | | |
|-------------|-----------------------------|-----|
| 5332 | Zero open loop torque limit | 400 |
|-------------|-----------------------------|-----|

[Data type] Integrated type

[Data range] 0~400

[Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 5333 | The 2 nd speed proportion gain | 500 |
|-------------|---|-----|

[Data type] Integrated type

[Data range] 0~10000

[Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5334 | Reserved | 0 |
|-------------|----------|---|

[Data type] Integrated type

[Data range] 0~10000

[Valid mode] Valid immediately

| | | |
|-------------|------------------|---|
| 5335 | Zero speed range | 0 |
|-------------|------------------|---|

[Data type] Integrated type

[Data range] 0~100

[Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 5336 | Enable is off after brake or switch off enable directly | 1 |
|-------------|---|---|

[Data type] Integrated type

[Data range] 0~1

[Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5337 | The 1 st gear ratio numerator | 1 |
|-------------|--|---|

[Data type] Integrated type

[Data range] 1~255

[Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5338 | The 1 st gear ratio denominator | 1 |
|-------------|--|---|

[Data type] Integrated type

[Data range] 1~255

[Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5339 | The 2 nd gear ratio numerator | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 1~255
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5340 | The 2 nd gear ratio denominator | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 1~255
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5341 | The 3 rd gear ratio numerator | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 1~255
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5342 | The 3 rd gear ratio denominator | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 1~255
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5343 | The 4 th gear ratio numerator | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 1~255
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5344 | The 4 th gear ratio denominator | 1 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 1~255
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 5345 | Speed operation command from the internal or the external | 1 |
|-------------|---|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|---|
| 5346 | Positioning finish pulse range | 3 |
|-------------|--------------------------------|---|

[Data type] Integrated type
 [Data range] 0~3000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------|-----|
| 5347 | Positioning speed | 300 |
|-------------|-------------------|-----|

[Data type] Integrated type
 [Data range] 1~6000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------|---|
| 5348 | Speed command negate | 0 |
|-------------|----------------------|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5349 | Reserved | 4 |
|-------------|----------|---|

[Data type] Integrated type

[Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5350 | Reserved | 6 |
|-------------|----------|---|

[Data type] Integrated type
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|----------|-----|
| 5351 | Reserved | 150 |
|-------------|----------|-----|

[Data type] Integrated type
 [Data range] 0~32767
 [Valid mode] Valid immediately

| | | |
|-------------|----------|----|
| 5352 | Reserved | 40 |
|-------------|----------|----|

[Data type] Integrated type
 [Data range] 1~100
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|---|
| 5353 | Positioning mode | 1 |
|-------------|------------------|---|

[Data type] Integrated type
 [Data range] 0~2
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------|---|
| 5354 | Positioning source | 1 |
|-------------|--------------------|---|

[Data type] Integrated type
 [Data range] 0~2
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------|-----|
| 5355 | Positioning position | 500 |
|-------------|----------------------|-----|

[Data type] Integrated type
 [Data range] 0~9999
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------------|------|
| 5356 | The 2 nd code pulse number | 1024 |
|-------------|---------------------------------------|------|

[Data type] Integrated type
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------|---|
| 5357 | Control mode switch | 0 |
|-------------|---------------------|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5358 | Reserved | 0 |
|-------------|----------|---|

[Data type] Integrated type
 [Data range] -10000~10000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|---|
| 5359 | Reserved | 2 |
|-------------|----------|---|

[Data type] Integrated type
 [Data range] 1~4
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------------|----|
| 5360 | Maintain the current proportion gain | 70 |
|-------------|--------------------------------------|----|

[Data type] Integrated type
 [Data range] 1~500
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------------------|----|
| 5361 | Current integral time constant | 80 |
|-------------|--------------------------------|----|

[Data type] Integrated type
 [Data range] 1~10000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------------|----|
| 5362 | Current integral separate point | 50 |
|-------------|---------------------------------|----|

[Data type] Integrated type
 [Data range] 0~500
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 5363 | Position offset value when the position mode is switched into the speed one | 5 |
|-------------|---|---|

[Data type] Integrated type
 [Data range] 0~400
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------|------|
| 5364 | Current low-pass end rate | 1000 |
|-------------|---------------------------|------|

[Data type] Integrated type
 [Data range] 1~1500
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------|-----|
| 5365 | Speed integral separate point | 300 |
|-------------|-------------------------------|-----|

[Data type] Integrated type
 [Data range] 0~3000
 [Valid mode] Valid immediately

| | | |
|-------------|------------------|-----|
| 5366 | Exciting current | 230 |
|-------------|------------------|-----|

[Data type] Integrated type
 [Data range] 10~1000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|------|
| 5367 | Reserved | 1000 |
|-------------|----------|------|

[Data type] Integrated type
 [Data range] 100~2000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------|------|
| 5368 | Time constant | 6500 |
|-------------|---------------|------|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|----------|-----|
| 5369 | Reserved | 950 |
|-------------|----------|-----|

[Data type] Integrated type
 [Data range] 100~1000
 [Valid mode] Valid immediatel

| | | |
|-------------|----------------------------|------|
| 5370 | Weak current control point | 1000 |
|-------------|----------------------------|------|

[Data type] Integrated type
 [Data range] 5~20000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------|------|
| 5371 | Motor rotor inertia | 1050 |
|-------------|---------------------|------|

[Data type] Integrated type
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|--------------------|-----|
| 5372 | Motor rated torque | 140 |
|-------------|--------------------|-----|

[Data type] Integrated type
 [Data range] 1~1000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------|-------|
| 5373 | Motor rated speed | 10000 |
|-------------|-------------------|-------|

[Data type] Integrated type
 [Data range] 0~15000
 [Valid mode] Valid immediately

| | | |
|-------------|---|-------|
| 5374 | Detection speed of the over-speed alarm | 10000 |
|-------------|---|-------|

[Data type] Integrated type
 [Data range] 0~15000
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------|----|
| 5375 | Motor rated current | 93 |
|-------------|---------------------|----|

[Data type] Integrated type
 [Data range] 1~1000
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5376 | Maximum overload times allowed by the system | 300 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~500
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5377 | Overload torque starting detection point | 117 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~300
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------------|-----|
| 5378 | Torque of the overload torque point | 200 |
|-------------|-------------------------------------|-----|

[Data type] Integrated type
 [Data range] 0~300
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5379 | Maximum overload time of the overload torque point | 400 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|-----|
| 5380 | Brake time of the maximum torque | 100 |
|-------------|----------------------------------|-----|

[Data type] Integrated type
 [Data range] 0~10000
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5381 | The magnifier saturation time of the maximum speed | 450 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|-----|
| 5382 | Current gain equivalent constant | 400 |
|-------------|----------------------------------|-----|

[Data type] Integrated type
 [Data range] 1~5000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------|---|
| 5383 | Acceleration time | 0 |
|-------------|-------------------|---|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------|-----|
| 5384 | Deceleration time | 500 |
|-------------|-------------------|-----|

[Data type] Integrated type
 [Data range] 0~30000
 [Valid mode] Valid immediately

| | | |
|-------------|--|----|
| 5385 | Repeated period of the keypad up/down keys | 37 |
|-------------|--|----|

[Data type] Integrated type
 [Data range] 2~200
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------------|-----|
| 5386 | Current detection coefficient | 200 |
|-------------|-------------------------------|-----|

[Data type] Integrated type
 [Data range] 1~32767
 [Valid mode] Valid immediately

| | | |
|-------------|---|---|
| 5387 | Zero clear of position offset is invalid in non-running state | 0 |
|-------------|---|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--|---|
| 5388 | Input terminal control is invalid during running | 0 |
|-------------|--|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------|------|
| 5389 | Encoder pulse number | 2500 |
|-------------|----------------------|------|

[Data type] Integrated type
 [Data range] 1~10000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------|------|
| 5390 | Motor rated speed | 6000 |
|-------------|-------------------|------|

[Data type] Integrated type
 [Data range] 10~20000
 [Valid mode] Valid immediately

| | | |
|-------------|--|----|
| 5391 | Current of the encoder adjusting into zero | 50 |
|-------------|--|----|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5392 | Starting detection point of the torque in the motor overheat | 105 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 10~300
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5393 | Torque corresponding to the motor overheat time constant | 130 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 10~300
 [Valid mode] Valid immediately

| | | |
|-------------|---|-----|
| 5392 | Torque starting detection point in the motor overheat | 105 |
|-------------|---|-----|

[Data type] Integrated type
 [Data range] 10~300
 [Valid mode] Valid immediately

| | | |
|-------------|--|-----|
| 5393 | Torque corresponding to the motor overheat time constant | 130 |
|-------------|--|-----|

[Data type] Integrated type
 [Data range] 10~300
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------------|-----|
| 5394 | The motor overheat time constant | 900 |
|-------------|----------------------------------|-----|

[Data type] Integrated type
 [Data range] 10~10000
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------|---|
| 5395 | The motor pole pairs | 4 |
|-------------|----------------------|---|

[Data type] Integrated type
 [Data range] 1~10
 [Valid mode] Valid immediately

| | | |
|-------------|---------------------------|----|
| 5396 | Open loop running current | 20 |
|-------------|---------------------------|----|

[Data type] Integrated type
 [Data range] 1~60
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------|-----|
| 5397 | Open loop running speed | 150 |
|-------------|-------------------------|-----|

[Data type] Integrated type
 [Data range] 0~3000
 [Valid mode] Valid immediately

| | | |
|-------------|-------------------------|---|
| 5398 | Internal enforce enable | 0 |
|-------------|-------------------------|---|

[Data type] Integrated type
 [Data range] 0~1
 [Valid mode] Valid immediately

| | | |
|-------------|----------------------------|-----|
| 5399 | Setting the module current | 350 |
|-------------|----------------------------|-----|

[Data type] Integrated type
 [Data range] 10~5000
 [Valid mode] Valid immediately

4.16 User Macro Program Parameters (6000~6999)

| | 7# | 6# | 5# | 4# | 3# | 2# | 1# | 0# |
|-------------|----|----|----|----|----|-----|-----|-----|
| 6001 | | | | | | CCV | CLV | TCS |

[Data type] Bit
 [Data range] 0 or 1
 [Default] 0 0 0 0 0 0 0 0
 [Valid mode] Valid after resetting

TCS T code calling subprogram 9000
 0: Invalid
 1: Valid
 CLV Local variables 1~33
 0: Clear to "null" after resetting
 1: Not clear after resetting
 CCV Common variables 100~199
 0: Clear to "null" after resetting
 1: Not clear after resetting

| | | |
|-------------|-----------------------------------|---|
| 6050 | G code that calls the macro O9010 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6051 | G code that calls the macro O9011 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6052 | G code that calls the macro O9012 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6053 | G code that calls the macro O9013 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6054 | G code that calls the macro O9014 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6055 | G code that calls the macro O9015 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6056 | G code that calls the macro O9016 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6057 | G code that calls the macro O9017 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6058 | G code that calls the macro O9018 | 0 |
|-------------|-----------------------------------|---|

| | | |
|-------------|-----------------------------------|---|
| 6059 | G code that calls the macro O9019 | 0 |
|-------------|-----------------------------------|---|

[Data type] Integrated type
 [Data range] 0~999
 [Valid mode] Valid after resetting

These parameters are set the G codes that call the user macros of program numbers 9010~9019.

Remark:
When the set value is 0, it is invalid, so G00 can't call the macros.

| | | |
|-------------|---|---|
| 6071 | M code that calls the subprogram number O9001 | 6 |
| 6072 | M code that calls the subprogram number O9002 | 0 |
| 6073 | M code that calls the subprogram number O9003 | 0 |
| 6074 | M code that calls the subprogram number O9004 | 0 |
| 6075 | M code that calls the subprogram number O9005 | 0 |
| 6076 | M code that calls the subprogram number O9006 | 0 |
| 6077 | M code that calls the subprogram number O9007 | 0 |
| 6078 | M code that calls the subprogram number O9008 | 0 |
| 6079 | M code that calls the subprogram number O9009 | 0 |

[Data type] Integrated type
[Data range] 0~999
[Valid mode] Valid after resetting

These parameters are set the M codes that call the user macros of program numbers 9001 ~9009.

Note
Setting value 0 is invalid. No subprogram can be called by M00.

| | | |
|-------------|---|---|
| 6080 | M code that calls the subprogram number O9020 | 0 |
| 6081 | M code that calls the subprogram number O9021 | 0 |
| 6082 | M code that calls the subprogram number O9022 | 0 |
| 6083 | M code that calls the subprogram number O9023 | 0 |

| | | |
|-------------|---|---|
| 6084 | M code that calls the subprogram number O9024 | 0 |
| 6085 | M code that calls the subprogram number O9025 | 0 |
| 6086 | M code that calls the subprogram number O9026 | 0 |
| 6087 | M code that calls the subprogram number O9027 | 0 |
| 6088 | M code that calls the subprogram number O9028 | 0 |
| 6089 | M code that calls the subprogram number O9029 | 0 |

[Data type] Integrated type

[Data unit] 0~999

[Valid mode] Valid after resetting

These parameters are set the M codes that call the user macros of program numbers 9020~9029.

Note
Setting value 0 is invalid. No user macro program can be called by M00.

4.17 PLC axis control parameters (7000~7199)

| | | |
|-------------|---|---|
| 7010 | DI/DO group selection of each axis controlled by PLC axis | 0 |
|-------------|---|---|

[Data type] Integral number axis

[Data unit] 0~4

[Valid mode] Valid after resetting

The parameters are set DI/DO group number used by the control axis commands of each axis which is controlled by PLC axis.

| SET VALUE | MEANING |
|-----------|-----------------------------|
| 0 | Not use PLC axis control |
| 1 | Use DI/DO signal of group A |
| 2 | Use DI/DO signal of group B |
| 3 | Use DI/DO signal of group C |
| 4 | Use DI/DO signal of group D |

4.18 Five-axis machining parameters (8000~8999)

| | | |
|-------------|------------------------|----|
| 8010 | Machine structure type | 12 |
|-------------|------------------------|----|

[Data type] Integrated type

[Data unit] 0~21

[Valid mode] Valid after resetting

| | |
|----|------------------------|
| | Machine structure type |
| 2 | Tool rotary type |
| 12 | Worktable rotary type |
| 21 | Compound type |

| | | |
|-------------|--|---|
| 8012 | The axial direction of the 1 st rotary axis | 2 |
|-------------|--|---|

[Data type] Integrated type

[Data unit] 0~3

[Valid mode] Valid after resetting

| | |
|---|--|
| | The axial direction of the 1 st rotary axis |
| 1 | The axial direction revolving with X axis |
| 2 | The axial direction revolving with Y axis |
| 3 | The axial direction revolving with Z axis |

| | | |
|-------------|--|---|
| 8016 | The axial direction of the 2 nd rotary axis | 3 |
|-------------|--|---|

[Data type] Integrated type

[Data unit] 0~5

[Valid mode] Valid after resetting

| | |
|---|--|
| | The axial direction of the 2 nd rotary axis |
| 1 | The axial direction revolving with X axis |
| 2 | The axial direction revolving with Y axis |
| 3 | The axial direction revolving with Z axis |

| | | |
|-------------|----------------------|---|
| 8019 | Tool axial direction | 3 |
|-------------|----------------------|---|

[Data type] Integrated type

[Data unit] 0~3

[Valid mode] Valid after resetting

| | |
|---|---|
| | Tool axial direction |
| 1 | The axial direction revolving with X axis |
| 2 | The axial direction revolving with Y axis |
| 3 | The axial direction revolving with Z axis |

| | | |
|-------------|-----------------------|---|
| 8020 | Rotary table position | 0 |
|-------------|-----------------------|---|

[Data type] Real number axis

[Data unit] mm

[Data range] -10000~10000

[Valid mode] Valid after resetting

Remark:
It includes the coordinate parameters of the three axes X, Y and Z.

| | | |
|-------------|--|---|
| 8021 | The vector from the 1 st rotary axis to the 2 nd rotary axis | 0 |
|-------------|--|---|

[Data type] Real number axis
[Data unit] mm
[Data range] -10000~10000
[Valid mode] Valid after resetting

Remark:
It includes the coordinate parameters of the three axes X, Y and Z.

| | | |
|-------------|---|---|
| 8022 | The vector from the tool axis to the tool rotary axis | 0 |
|-------------|---|---|

[Data type] Real number axis
[Data unit] mm
[Data range] -10000~10000
[Valid mode] Valid after resetting

Remark:
It includes the coordinate parameters of the three axes X, Y and Z.

| | | |
|-------------|--|---|
| 8023 | The vector from the tool 2 nd rotary axis to the tool 1 st rotary axis | 0 |
|-------------|--|---|

[Data type] Real number axis
[Data unit] mm
[Data range] -10000~10000
[Valid mode] Valid after resetting

Remark:
It includes the coordinate parameters of the three axes X, Y and Z.

APPENDIX

APPENDIX I PRECISION COMPENSATION

1.1 Backlash compensation

(1) Common backlash compensation:

When No.1403#5 is set as “1”, No.1403#4 as “0”, the compensation value is set in parameter No.4121, the compensation value range of each axis is 0~±9999.9999mm.

(2) Backlash compensation respectively during rapid traverse and cutting feed:

When No.1403#5 and No.1403#4 are set as “1”, the different backlash in the reverse directions respectively compensate the backlash values during the rapid traverse or cutting feed, the machining of the higher precision can be realized based on the feedrate change. The measured backlash during cutting feed is set by No.4121, the measured backlash during rapid traverse is set by No.4122.

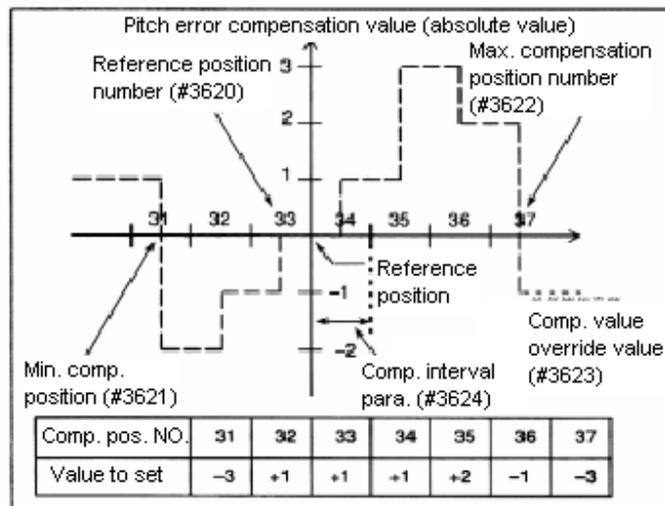
1.2 Unidirectional pitch error compensation

Overview

If the pitch error compensation data are specified, the pitch error of each axis can be compensated based on the detection unit. The compensation position of each axis compensation data is set according to the fixed interval. The compensation origin is the zero of each axis zero return of the machine. The compensation data are set based on the actual measured error.

The pitch error compensation data are set in the menu **OFFSET SETTING** on the “pitch error compensation” interface; the pitch error value can only be set or rewritten after “logging in” to obtain the authority of the machine manufacturer or above it.

When the pitch error compensation is operated, the following parameters must be set. The pitch error of each compensation point (each point is with the sequence number according to the position) is set based on these parameters.



In the following example, the reference point is taken as the standard point for compensating, the serial number of the compensation number is set as 33.

Whether perform the pitch error compensation: Parameter 2800.0.

Select unidirectional or bidirectional for the pitch error compensation: Parameter 2800.1

The position number of pitch error compensation (each axis) of the reference point: Parameter 2810

The min. position number of the pitch error compensation (each axis): Parameter 2811.

The max. position number of the pitch error compensation (each axis): Parameter 2812.

Override of the pitch error compensation (each axis): Parameter 2813.

The compensation point interval of the pitch error compensation (each axis): Parameter 2814.

Remark:

1. Define the compensation position

To specify the compensation position for each axis, the compensation positive and negative directions should be specified on which the reference position is taken as the standard one. If the machine stroke exceeds the specified range in positive or negative directions, the pitch error compensation doesn't function for the stroke out of the range.

2. Compensation position point number

On the interface for setting the pitch error, there are total 1024 compensation points from 0~1023. The compensation points can be distributed for each axis at random with parameters, the compensation position number (parameter 2810) of the reference position, the min. position number (parameter 2811) and the max. position number (parameter 2812) must be set for each axis.

3. Intervals of compensation points

The compensation positions (points) are with the equal interval, which are set by parameter No.2814 and each axis can be set respectively.

The minimum compensation interval is limited, which can be calculated with the following formula:

$$\text{The min. interval of the compensation point} = \frac{\text{the max. feedrate} * (\text{the interpolation cycle}/60000)}{\text{* compensation override}}$$

Unit: The min. interval of compensation: mm, inch, deg, the max. feedrate: mm/min, inch/min, deg/min.

(Example) When the maximum rapid traverse rate is 15000mm/min, the min. interval of the compensation point is 2mm.

For example

When it is the linear axis

The machine stroke range: -400mm ~ +800mm

The pitch error compensation point interval: 50mm

The compensation position number of the reference position is: 40.

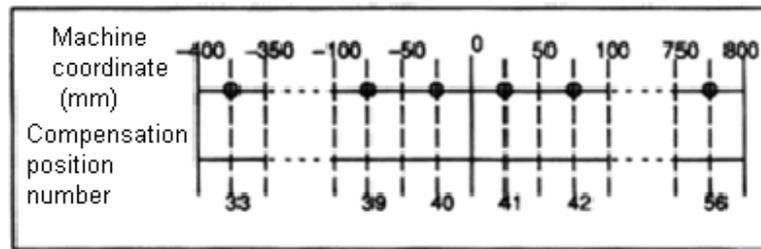
After specifying the above values, the farthest compensation position number in the negative direction is as below:

The farthest compensation position number in the negative direction = the compensation position number of the reference position - (the machine limit in the negative direction/compensation position interval) +1 = 40 - 400/50 +1=33

The farthest compensation position number in the positive direction is as below:

The farthest compensation position number in the positive direction = the compensation position number of the reference position + (the machine stroke in the positive direction/the compensation position interval) = 40+800/50 = 56

The corresponding relation between the machine coordinate value and the compensation position number is shown as below:



In the above figure, the compensation value is output in the position with symbol O.

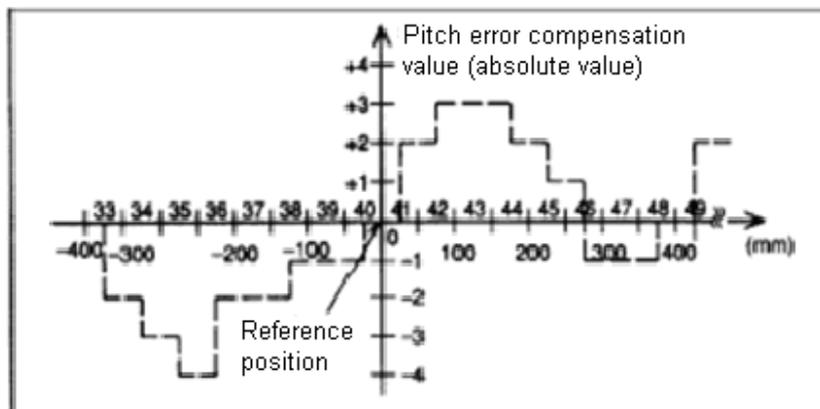
Therefore, the parameter is set as below:

| PARAMETER | SET VALUE |
|--|-----------|
| 2810: The compensation position number of the reference position | 40 |
| 2811: Min. compensation position number | 33 |
| 2812: Max. compensation position number | 56 |
| 2813: Compensation override | 1 |
| 2814: Pitch error compensation point interval | 50 |

Output the compensation value between two coordinate values corresponding to the compensation position number.

The following is one example of the compensation amounts:

| | | | | | | | | | | | | | | | | | | | |
|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|
| Point NO. | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | ... | 56 |
| Compensation | -2 | -1 | -1 | +2 | 0 | +1 | 0 | +1 | +2 | +1 | 0 | -1 | -1 | -2 | 0 | +1 | +2 | ... | +1 |



When it is the rotary axis

Displacement each revolution: 360°

Interval of pitch error compensation point: 45°.

The compensation position number of the reference position: 60.

After specifying the above parameters, the rotary axis is

The farthest compensation position number in the negative direction = the compensation position number of the reference position

The farthest compensation position number in the positive direction is as below:

The farthest compensation position number in the positive direction = the compensation position number of the reference position + (the displacement each revolution/the compensation interval)
 = 60 + 360/45 = 68

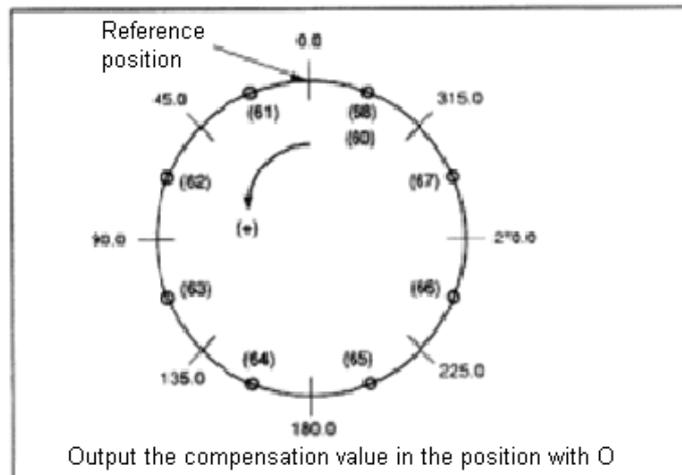
Remark:

The compensation data of the rotary axis must be specified in the displacement range of one revolution in the positive direction. During the actual running, if the displacement of one revolution is in the negative direction, one more displacement of one revolution should be added to switch into the displacement of one revolution in the positive direction.

Example:

When the compensation value is set in -45° position, $-45° + 360° = 315°$, the compensation value in -45° position should be set in the compensation sequence number corresponding to 315°.

Then, the corresponding relation between the machine coordinate value and the compensation position number is as below:



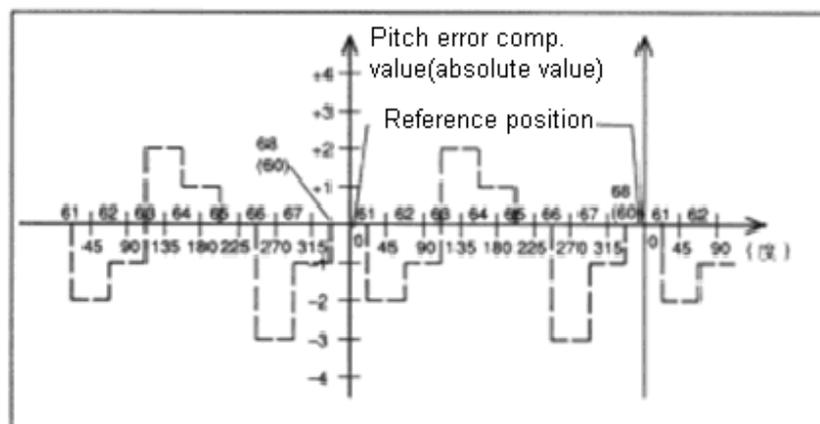
Therefore, the set parameters are as below:

| PARAMETER | SET VALUE |
|--|-----------|
| 2810: The compensation position number of the reference position | 60 |
| 2811: Min. compensation position number | 60 |
| 2812: Max. compensation position number | 68 |
| 2813: Compensation override | 1 |
| 2814: Pitch error compensation point interval | 45 |
| 1068: Displacement per revolution | 360 |

If the total sum of the compensation values from positions 61~68 is not 0, the compensation value of each revolution will be accumulated, and then, the position offset occurs. In the compensation positions of 60 and 68, the same value must be set.

The following is one example of the compensation amounts:

| Point NO. | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 |
|--------------|----|----|----|----|----|----|----|----|----|
| Compensation | +1 | -2 | +1 | +3 | -1 | -1 | -3 | +2 | +1 |

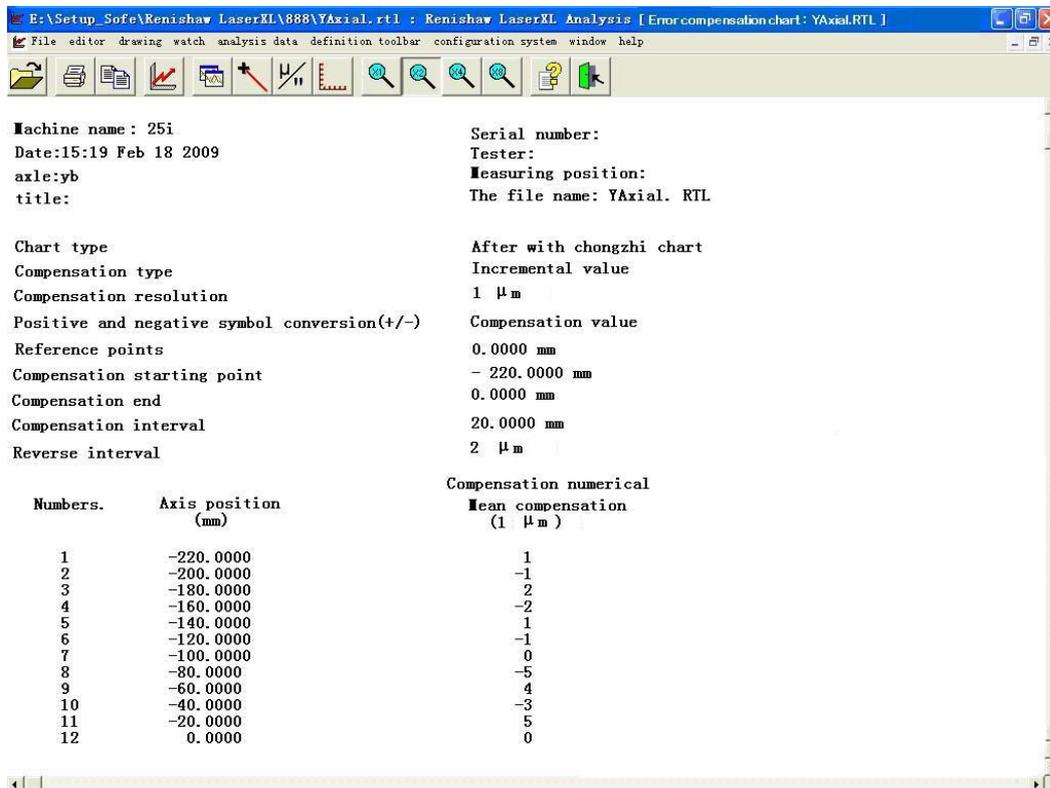


The compensation operation practice:

In the above example, the machine is operated after the reference point return in Jog mode:

0, -20, -40, -60, -80, -100, -120, -140, -160, -180, -200, -220,
-220, -200, -180, -160, -140, -120, -100, -80, -60, -40, -20, 0

The data measured by the laser interference instrument are as below:



The error compensation value output is as below:

| PARA.NO. | SETTING | REMARK |
|----------|---------|---|
| 2800.1 | 0 | Bidirectional pitch error compensation: 1: Valid/ 0: Invalid |
| 2810 | 11 | The pitch error compensation point number corresponding to the machine reference position |
| 2811 | 1 | The farthest pitch error compensation point number in the negative side during moving in the positive direction |
| 2812 | 11 | The farthest pitch error compensation point number in the positive side during moving in the positive direction |
| 2813 | 1 | Ratio of the compensation values |
| 2814 | 20 | Interval of the compensation points |
| 1068 | - | Revolving amount per revolution of the rotary axis |

(Data of the positive compensation point during unidirectional compensation)

| | | | | | | | | | | | | |
|--------------------|----|----|----|----|----|---|----|---|----|----|----|---|
| Positive point NO. | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Compensation | 0 | +5 | -3 | +4 | -5 | 0 | -1 | 1 | -2 | +2 | -1 | 1 |

Remark:

1. Range of the compensation value

Setting range of the compensation value: -7^* compensation override (detection unit)~ 7^* compensation override (detection unit). The compensation override of each axis can be respectively set in parameter No.2814, the range of the value is: 0~100.

2. Pitch error compensation of the rotary axis

For the rotary axis, the interval of the pitch error compensation points must be set as the integer multiples of one percent of the displacement per revolution (usually 360°). The total sum of all pitch error compensation values per revolution must be 0. Moreover, in the same position per revolution, the compensation value must be set same.

The compensation data of the rotary axis must be specified in the displacement of one revolution in the positive direction. During the actual running, if the displacement of one revolution is in the negative direction, one more displacement of one revolution must be added to switch into the displacement of one revolution in the positive direction.

Example:

When the compensation value in -45° position, $-45^\circ + 360^\circ = 315^\circ$, the compensation value in -45° position should be set in the compensation sequence number corresponding to 315° .

3. In the following situations, the pitch error compensation is not executed:

Remark: In the following situations, the pitch error compensation is not executed:

After power on, the machine doesn't return the reference position, but the situation doesn't include that the absolute position detector is used.

The interval between the pitch error compensation points is 0.

The compensation position number in positive or negative directions isn't in the range of 0~1023.

The compensation position number doesn't comply with the following relations: negative point number \leq reference point number $<$ positive point number.

1.3 Bidirectional pitch error compensation

Overview

The bidirectional pitch error compensation function is to set the compensation amounts in the machine positive and reverse directions; therefore, compensation can be executed respectively in positive and reverse directions to improve the compensation precision. Moreover, when the stroke is moved in opposite direction, the compensation amount can be automatically calculated based on the compensation data, and compensation can be executed same as the method of compensating the common stored pitch error. The bidirectional pitch error compensation can reduce the machine position error during moving in positive and reverse directions.

Setting data

1. Setting the parameters: The following parameters should be set for each axis:

List 1.3.3 (a)

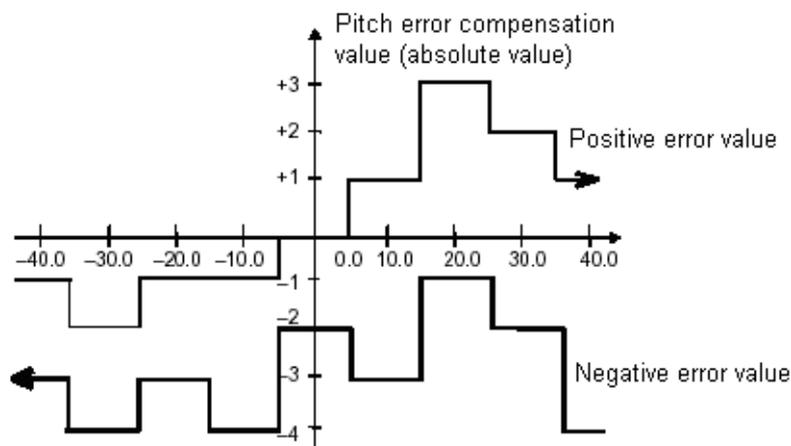
| Para. NO. | Remark |
|-----------|---|
| 2800.1 | The bidirectional pitch error compensation: 1:Valid /0: Invalid |
| 2806 | The pitch error compensation value of the reference position return |
| 2810 | The pitch error compensation point number corresponding to the machine reference position |
| 2811 | The farthest pitch error compensation point number in the negative side during moving in the positive direction |
| 2812 | The farthest pitch error compensation point number in the positive side during moving in the positive direction |
| 2813 | Ratio of the compensation values |
| 2814 | Interval of the compensation points |
| 1068 | Revolution amount per revolution of the rotary axis |

2. Pitch error compensation data

The pitch error compensation point numbers are corresponded to 0~1023 in positive direction, 0~1023 in reverse direction.

Data setting example

It is assumed that the direction of manual reference position return is positive (the linear axis), the pitch error is as the following figure (fig. 1.3.3(b)), the data are set as the following list (list 1.3.3(b)).



List 1.3.3(b) Positive error compensation data

| | | | | | | | | |
|------------------------|----|----|----|----|----|----|----|----|
| Compensation point NO. | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| Set compensation value | -1 | +1 | 0 | +1 | +1 | +2 | -1 | -1 |

The pitch error data are always set the incremental value and the user should look from the negative direction (left direction of fig. 1.3.3(b)).

List 1.3.3(c) Negative error compensation data

| | | | | | | | | |
|------------------------|----|----|----|----|----|----|----|----|
| Compensation point NO. | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| Set compensation value | -1 | +1 | -1 | +2 | -1 | +2 | -1 | -2 |

After setting the positive compensation data, the pitch error compensation data of each point in the negative direction are set.

The pitch error data are always set the incremental value and the user should look from the negative direction.

List 1.3.3(d)

| PARA. NO. | SETTING | REMARK |
|-----------|---------|---|
| 2800.1 | 1 | The bidirectional pitch error compensation: 1:Valid / 0: Invalid |
| 2806 | -2 | The pitch error compensation value of reference position return |
| 2810 | 23 | The pitch error compensation point number corresponding to the machine reference position |
| 2811 | 20 | The farthest pitch error compensation point number in the negative side during moving in the positive direction |
| 2812 | 27 | The farthest pitch error compensation point number in the positive side during moving in the positive direction |
| 2813 | 1 | Ratio of the compensation values |
| 2814 | 10 | Interval of the compensation points |
| 1068 | - | Amount per revolution of the rotary axis |

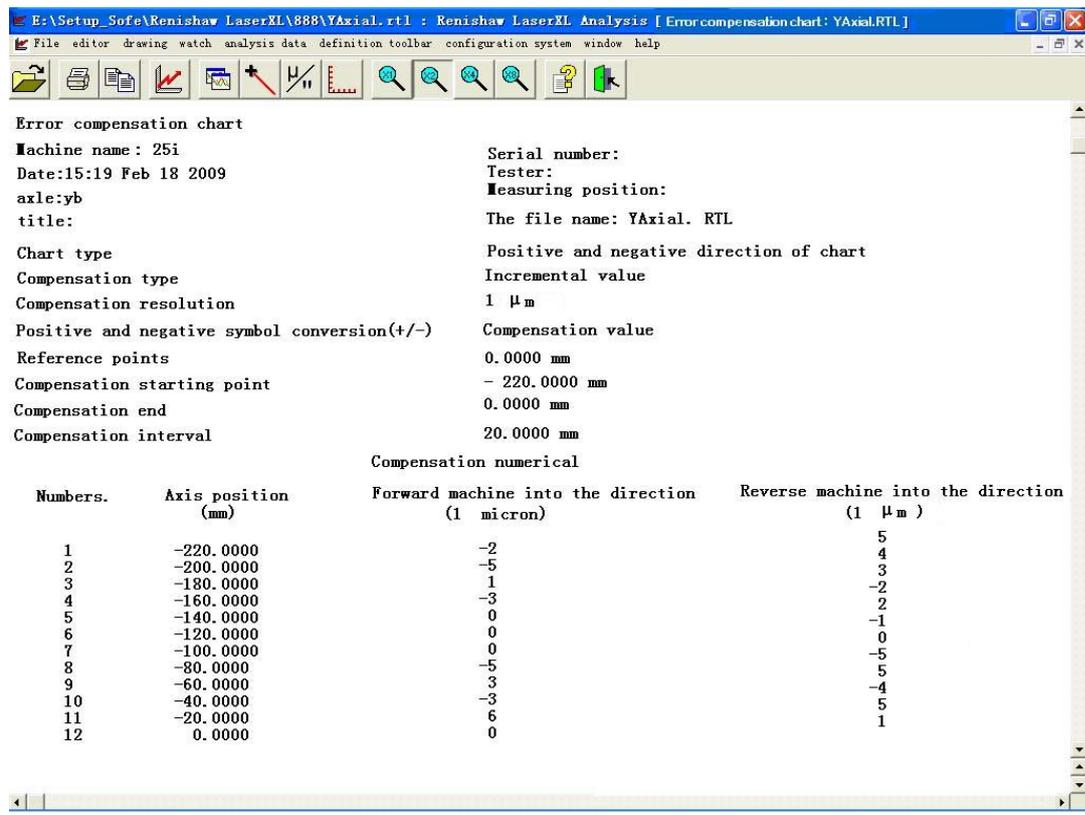
Compensation operation practice:

In the above example, after the manual reference point return, the machine is operated:

0, -20, -40, -60, -80, -100, -120, -140, -160, -180, -200, -220,
-220, -200, -180, -160, -140, -120, -100, -80, -60, -40, -20, 0

When the bidirectional compensation is operated:

The data measured by the laser interference instrument are as below:



Output the error compensation values are as below:

| PARA. NO. | SETTING | REMARK |
|-----------|---------|---|
| 2800.1 | 1 | The bidirectional pitch error compensation: 1:Valid / 0: Invalid |
| 2806 | 1 | The pitch error compensation values of reference position return |
| 2810 | 11 | The pitch error compensation point number corresponding to the machine reference position |
| 2811 | 1 | The farthest pitch error compensation point number in the negative side during moving in the positive direction |
| 2812 | 11 | The farthest pitch error compensation point in the positive side during moving in the positive direction |
| 2813 | 1 | Ratio of the compensation values |
| 2814 | 20 | Interval of the compensation points |
| 1068 | - | Amount per revolution of the rotary axis |

| Negative point NO. | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|--------------------|----|----|----|----|----|---|----|----|----|----|----|----|
| Compen sation | 1 | +5 | -4 | +5 | -5 | 0 | -1 | +2 | -2 | +3 | +4 | +5 |

Appendix I Precision Compensation

| | | | | | | | | | | | | |
|--------------------|----|----|----|---|----|---|---|---|----|----|----|----|
| Positive point NO. | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Compensation | 0 | +6 | -3 | 3 | -5 | 0 | 0 | 0 | -3 | +1 | -5 | -2 |

APPENDIX II RECORD of the USER MANUAL REVISION

| VERSION NO. | REVISED DATE | REMARK |
|-------------|--------------|---|
| V1.0 | 2009-12-20 | The 1 st version of the basic manual |
| V1.1 | 2010-3-26 | Some parameters are rewritten, the feed synchronous parameters, PMC parameters and five-axis machining parameters are added, which are corresponding to the version 3.1.6-10.03.18-2. |
| V1.2 | 2010-3-30 | Some parameters are rewritten, the parameter default value and range are revised |
| V1.3 | 2010-4-02 | Servo parameter definition |
| V1.4 | 2010-4-08 | Some interpolation parameters are added, which are corresponding to the version V3.1.8-10.04.0. |
| V1.5 | 2010-5-07 | The spindle speed fluctuation detection parameters are added, which are corresponding to the version V3.1.8-10.04.08-5. |
| V1.6 | 2010-5-17 | The synchronous axis torque limit parameters and servo in-position width parameters are added, which are corresponding to the version V3.1.8-10.04.08-6. |
| V1.7 | 2010-5-21 | The spindle parameters and the rigid tapping parameters are revised, which are corresponding to the version V3.2.0-10.05.24. |
| V1.8 | 2010-7-09 | Some parameters are revised, which are corresponding to the version V3.2.0-10.07.09-4. |
| V1.9 | 2010-8-4 | The pulse version parameters are deleted, some parameters are revised, which are corresponding to the version V3.2.0-10.07.09-4. |
| V2.0 | 2010-8-16 | The position switches are added to 32, the servo multi-ring and signal ring parameters are added, the corresponding parameters are rewritten, which are corresponded to the version V3.2.1-2010-8-16_D. |
| V2.1 | 2010-8-19 | Parameter 2113 is added, parameter 1800 is revised, and parameter 4120 is deleted, which are corresponding to the version V3.2.1-2010-8-18-D. |
| V2.2 | 2010-8-25 | The extended external mechanical origin offset function parameters 2430 and 2431 are added, which are corresponding to the version V3.2.1-2010-8-25-D. |
| V2.3 | 2010-9-8 | Bit parameter 1031 is deleted, the explanation is rewritten, which are corresponding to the version 172. |
| V2.4 | 2010-9-15 | The double position loop parameters 4016 and bit |

Appendix II Record of the User Manual Revision

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|-------------|-------------------|--|
| | | parameter DPOS of 4001 are added, which are corresponding to the version V3.2.1-2010-9-15-D (177). |
| V2.5 | 2011-5-12 | Some servo parameters are revised, which are corresponding to the version 3.2.6-7. |
| V2.6 | 2011-07-20 | The parameters are collated, again, and the valid modes are added, which are corresponding to the version V3.2.7-8. |
| V2.7 | 2011-12-14 | he parameters are added, and the valid modes are revised .The corresponding version is V3.4.0. |
| V2.8 | 2012-06-26 | The system parameter interface, the parameter user manual and the codes (parameters) should be unified and verified. The corresponding version is V3.4.4-B9. |
| V2.9 | 2013-05-08 | Turning cycle parameters and Spindle Control Parameters are added, which are corresponding to the version V3.4.4-B11.1. |