# PARAMETER LIST

**for**

## MAZATROL FUSION 640MT/MT 5X
## MAZATROL FUSION 640T/TE
## MAZATROL FUSION 640T NEXUS/TN

**MANUAL No. : H734SA0033E**

**Serial No. :**

***Before using this machine and equipment, fully understand the contents of this manual to ensure proper operation. Should any questions arise, please ask the nearest Technical/Service Center.***

## IMPORTANT NOTICE

1. **Be sure to observe the safety precautions described in this manual and the contents of the safety plates on the machine and equipment. Failure may cause serious personal injury or material damage. Please replace any missing safety plates as soon as possible.**
2. **No modifications are to be performed that will affect operation safety. If such modifications are required, please contact the nearest Technical/Service Center.**
3. **For the purpose of explaining the operation of the machine and equipment, some illustrations may not include safety features such as covers, doors, etc. Before operation, make sure all such items are in place.**
4. **This manual was considered complete and accurate at the time of publication, however, due to our desire to constantly improve the quality and specification of all our products, it is subject to change or modification. If you have any questions, please contact the nearest Technical/Service Center.**
5. **Always keep this manual near the machinery for immediate use.**
6. **If a new manual is required, please order from the nearest Technical/Service Center with the manual No. or the machine name, serial No. and manual name.**

**Issued by *Manual Publication Section, Yamazaki Mazak Corporation*, Japan**

12. 2003

# SAFETY PRECAUTIONS

## Preface

Safety precautions relating to the CNC unit (in the remainder of this manual, referred to simply as the NC unit) that is provided in this machine are explained below. Not only the persons who create programs, but also those who operate the machine must thoroughly understand the contents of this manual to ensure safe operation of the machine.

Read all these safety precautions, even if your NC model does not have the corresponding functions or optional units and a part of the precautions do not apply.

## Rule

1. This section contains the precautions to be observed as to the working methods and states usually expected. Of course, however, unexpected operations and/or unexpected working states may take place at the user site.
   During daily operation of the machine, therefore, the user must pay extra careful attention to its own working safety as well as to observe the precautions described below.
2. Although this manual contains as great an amount of information as it can, since it is not rare for the user to perform the operations that overstep the manufacturer-assumed ones, not all of “what the user cannot perform” or “what the user must not perform” can be fully covered in this manual with all such operations taken into consideration beforehand.
   It is to be understood, therefore, that functions not clearly written as “executable” are “inexecutable” functions.
3. The meanings of our safety precautions to DANGER, WARNING, and CAUTION are as follows:

**DANGER** : Failure to follow these instructions could result in loss of life.

**WARNING** : Failure to observe these instructions could result in serious harm to a human life or body.

**CAUTION** : Failure to observe these instructions could result in minor injuries or serious machine damage.

## Basics

**WARNING**

- After turning power on, keep hands away from the keys, buttons, or switches of the operating panel until an initial display has been made.
- Before proceeding to the next operations, fully check that correct data has been entered and/or set. If the operator performs operations without being aware of data errors, unexpected operation of the machine will result.
- Before machining workpieces, perform operational tests and make sure that the machine operates correctly. No workpieces must be machined without confirmation of normal operation. Closely check the accuracy of programs by executing override, single-block, and other functions or by operating the machine at no load. Also, fully utilize tool path check, solid check, and other functions, if provided.
- Make sure that the appropriate feed rate and rotational speed are designated for the particular machining requirements. Always understand that since the maximum usable feed rate and rotational speed are determined by the specifications of the tool to be used, those of the workpiece to be machined, and various other factors, actual capabilities differ from the machine specifications listed in this manual. If an inappropriate feed rate or rotational speed is designated, the workpiece or the tool may abruptly move out from the machine.
- Before executing correction functions, fully check that the direction and amount of correction are correct. Unexpected operation of the machine will result if a correction function is executed without its thorough understanding.
- Parameters are set to the optimum standard machining conditions prior to shipping of the machine from the factory. In principle, these settings should not be modified. If it becomes absolutely necessary to modify the settings, perform modifications only after thoroughly understanding the functions of the corresponding parameters. Modifications usually affect any program. Unexpected operation of the machine will result if the settings are modified without a thorough understanding.

## Remarks on the cutting conditions recommended by the NC

**WARNING**

- Before using the following cutting conditions:
  - Cutting conditions that are the result of the MAZATROL Automatic Cutting Conditions Determination Function
  - Cutting conditions suggested by the Machining Navigation Function
  - Cutting conditions for tools that are suggested to be used by the Machining Navigation Function

  Confirm that every necessary precaution in regards to safe machine setup has been taken – especially for workpiece fixturing/clamping and tool setup.
- Confirm that the machine door is securely closed before starting machining.
  Failure to confirm safe machine setup may result in serious injury or death.

## Programming

**WARNING**

- Fully check that the settings of the coordinate systems are correct. Even if the designated program data is correct, errors in the system settings may cause the machine to operate in unexpected places and the workpiece to abruptly move out from the machine in the event of contact with the tool.
- During surface velocity hold control, as the current workpiece coordinates of the surface velocity hold control axes approach zeroes, the spindle speed increases significantly. For the lathe, the workpiece may even come off if the chucking force decreases. Safety speed limits must therefore be observed when designating spindle speeds.
- Even after inch/metric system selection, the units of the programs, tool information, or parameters that have been registered until that time are not converted. Fully check these data units before operating the machine. If the machine is operated without checks being performed, even existing correct programs may cause the machine to operate differently from the way it did before.
- If a program is executed that includes the absolute data commands and relative data commands taken in the reverse of their original meaning, totally unexpected operation of the machine will result. Recheck the command scheme before executing programs.
- If an incorrect plane selection command is issued for a machine action such as arc interpolation or fixed-cycle machining, the tool may collide with the workpiece or part of the machine since the motions of the control axes assumed and those of actual ones will be interchanged. (This precaution applies only to NC units provided with EIA functions.)
- The mirror image, if made valid, changes subsequent machine actions significantly. Use the mirror image function only after thoroughly understanding the above. (This precaution applies only to NC units provided with EIA functions.)
- If machine coordinate system commands or reference position returning commands are issued with a correction function remaining made valid, correction may become invalid temporarily. If this is not thoroughly understood, the machine may appear as if it would operate against the expectations of the operator. Execute the above commands only after making the corresponding correction function invalid. (This precaution applies only to NC units provided with EIA functions.)
- The barrier function performs interference checks based on designated tool data. Enter the tool information that matches the tools to be actually used. Otherwise, the barrier function will not work correctly. (This precaution applies only to the M640MT/MT 5X/T/T NEXUS/TN and M640M Pro/MT Pro.)
- The system of G-code and M-code commands differs between the machines equipped with M640M Pro (e-Series such as the INTGEREX e-410, e-650 and e-1060) and the machines equipped with M640MT/MT 5X/T/T NEXUS/TN/MT Pro (such as the INTGEREX non e-Series, the SQT Series, the MPX Series and the QTN Series).
  Issuance of the wrong G-code or M-code command results in totally non-intended machine operation. Thoroughly understand the system of G-code and M-code commands before using this system.

| Sample program | Machine with M640M Pro | Machine with M640MT/MT 5X/T/ T NEXUS/TN/MT Pro |
|---|---|---|
| `S1000M3` | The milling spindle rotates at 1000 $min^{-1}$. | The turning spindle rotates at 1000 $min^{-1}$. |
| `S1000M203` | The turning spindle rotates at 1000 $min^{-1}$. | The milling spindle rotates at 1000 $min^{-1}$. |

- For the machines equipped with M640M Pro (e-Series such as the INTGEREX e-410, e-650 and e-1060), programmed coordinates can be rotated using an index unit of the MAZATROL program and a G68 command (coordinate rotate command) of the EIA program. However, for example, when the B-axis is rotated through 180 degrees around the Y-axis to implement machining with the turning spindle No. 2, the plus side of the X-axis in the programmed coordinate system faces downward and if the program is created ignoring this fact, the resulting movement of the tool to unexpected positions may incite collisions.
  To create the program with the plus side of the X-axis oriented in an upward direction, use the mirror function of the WPC shift unit or the mirror imaging function of G-code command (G50.1, G51.1).
- After modifying the tool data specified in the program, be sure to perform the tool path check function, the solid check function, and other functions, and confirm that the program operates properly. The modification of tool data may cause even a field-proven machining program to change in operational status.
  If the user operates the machine without being aware of any changes in program status, interference with the workpiece could arise from unexpected operation.
  For example, if the cutting edge of the tool during the start of automatic operation is present inside the clearance-including blank (unmachined workpiece) specified in the common unit of the MAZATROL program, care is required since the tool will directly move from that position to the approach point because of no obstructions being judged to be present on this path.
  For this reason, before starting automatic operation, make sure that the cutting edge of the tool during the start of automatic operation is present outside the clearance-including workpiece specified in the common unit of the MAZATROL program.

**CAUTION**

- If axis-by-axis independent positioning is selected and simultaneously rapid feed selected for each axis, movements to the ending point will not usually become linear. Before using these functions, therefore, make sure that no obstructions are present on the path.
- If the machine employs sliding surface structure, lubrication may prove to be insufficient during continuous microfeed machining (see Note 1 below), and in the worst case, seizure of the sliding surface could result. For these reasons, the sliding surface needs to be maintained in a well-lubricated condition during such machining by, for example, inserting an oil-film forming program (see Note 2 below).

  List of applicable models and intended axes (Models that employ sliding surface structure)

| Classification | Machine model | Axes with sliding surface structure |
|---|---|---|
| Lathes | INTEGREX 50Y | X-axis, Y-axis, Z-axis |
| | INTEGREX 50YB | X-axis, Y-axis, Z-axis |
| | INTEGREX 70Y | X-axis, Y-axis, Z-axis |
| | INTEGREX 70YB | X-axis, Y-axis, Z-axis |
| | SLANT TURN 450 | X-axis, Z-axis |
| | SLANT TURN 50N | X-axis, Z-axis |
| | SLANT TURN 60N | X-axis, Z-axis |
| | SLANT TURN 80N | X-axis, Z-axis |
| | TURNING CENTER M-4N | X-axis, Z-axis |
| | TURNING CENTER M-5N | X-axis, Z-axis |
| | POWER MASTER | X-axis, Z-axis |
| | QUICK TURN 40 | X-axis, Z-axis |
| | MEGA TURN series | X-axis, Z-axis |
| | SUPER QUADREX 200/250 | Z2-axis |
| | SUPER QUICK TURN 200/250MY | Y-axis |
| | SUPER QUICK TURN 300MY | Y-axis |
| Vertical machining centers | FJV-35/50/60 | Z-axis |
| | MTV-515/655/815 | Z-axis |
| | V-40/60 | Z-axis |

  For further details and more specific examples, refer to the relevant Machine Operating Manual, Part 4, Section 1-2, “Precautions for Microfeed Machining (Models that Employ Sliding Surface Structure)”.

**Note 1:** Continuous microfeed machining refers to the operation in which the movement of the intended feed axis through strokes shorter than those required for lubrication is continuously repeated.

**Note 2:** The oil-film forming program refers to a program that creates an oil film on the sliding surface by moving the intended machining axis over a long stroke during machining.

## Operations

**WARNING**

- Single-block, feed hold, and override functions can be made invalid using system variables #3003 and #3004. Execution of this means the important modification that makes the corresponding operations invalid. Before using these variables, therefore, give thorough notification to related persons. Also, the operator must check the settings of the system variables before starting the above operations.
- If manual intervention during automatic operation, machine locking, the mirror image function, or other functions are executed, the workpiece coordinate systems will usually be shifted. When making machine restart after manual intervention, machine locking, the mirror image function, or other functions, consider the resulting amounts of shift and take the appropriate measures. If operation is restarted without any appropriate measures being taken, collision with the tool or workpiece may occur.
- Use the dry run function to check the machine for normal operation at no load. Since the feed rate at this time becomes a dry run rate different from the program-designated feed rate, the axes may move at a feed rate higher than the programmed value.
- After operation has been stopped temporarily and insertion, deletion, updating, or other commands executed for the active program, unexpected operation of the machine may result if that program is restarted. No such commands should, in principle, be issued for the active program.

**CAUTION**

- During manual operation, fully check the directions and speeds of axial movement.
- For a machine that requires manual homing, perform manual homing operations after turning power on. Since the software-controlled stroke limits will remain ineffective until manual homing is completed, the machine will not stop even if it oversteps the limit area. As a result, serious machine damage will result.
- Do not designate an incorrect pulse multiplier when performing manual pulse handle feed operations. If the multiplier is set to 100 times and the handle operated inadvertently, axial movement will become faster than that expected.

# OPERATIONAL WARRANTY FOR THE NC UNIT

The warranty of the manufacturer does not cover any trouble arising if the NC unit is used for its non-intended purpose. Take notice of this when operating the unit.

Examples of the trouble arising if the NC unit is used for its non-intended purpose are listed below.

1. Trouble associated with and caused by the use of any commercially available software products (including user-created ones)
2. Trouble associated with and caused by the use of any Windows operating systems
3. Trouble associated with and caused by the use of any commercially available computer equipment

## Operating Environment

### 1. Ambient temperature

During machine operation: 5° to 40°C (41° to 104°F)

**Note:** When power is turned on, if the thermal sensor detects an ambient temperature under 5°C, the hard disk warm-up status indicator lamp will light up and the NC unit will not start operating at once. After automatic heating of the hard disk by its internal heater, the lamp will go out and the NC unit will start. It takes about 20 minutes for temperature to increase from 0 to 5°C in order to avoid condensation due to sudden changes in temperature.

### 2. Relative humidity

During machine operation: 30 to 75 % (without bedewing)

**Note:** As humidity increases, insulation deteriorates causing electrical component parts to deteriorate quickly.

- NOTE -

# CONTENTS

Page

- NOTE -

# 1 PREFACE

1. Scope of this manual
   This manual gives the parameters you can change as required. How to read the manual is described in the beginning of the list. Always refer to the manual to change parameters.
2. Precautions on this manual
   This manual is written to be adaptable to all the NC units and also gives parameters relating to optional functions. Accordingly, the manual includes parameters which can not be changed. Check the type of NC turning machine purchased by you and its specifications before you read the manual.

* The contents of this manual are subjected to change without notice, for NC unit or machine improvement.
* Any questions about the contents of this manual should be communicated to a nearby TC (technical center) or SC (service center) of YAMAZAKI MAZAK.

- NOTE -

# 2 PARAMETER LIST

## 2-1 USER PARAMETER

**Note:** M: Valid only for MAZATROL Program
E: Valid only for EIA/ISO Program

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P1 (bit 0) | Use/disuse of acceleration in up-going slope during rough cutting cycle in bar machining unit | – | Instant | M |
| P1 (bit 1) | Use/disuse of deceleration in down-going slope during rough cutting cycle in bar machining unit | – | Instant | M |
| P1 (bit 2) | | | | |
| P1 (bit 3) | Selection between use/disuse of acceleration distance check at start of thread cutting unit | – | Instant | M |
| P1 (bit 4) | Selection for thread number offset | – | Instant | M |
| P1 (bit 5) | Selection between whether or not tool should be returned to tool change position on M code unit end | – | Instant | M |
| P1 (bit 6) | Selection of whether the spindle is to be stopped following completion of the END unit | – | Instant | M |
| P1 (bit 7) | Selection between whether or not tool should be returned to tool change position before repetition of same program | – | Instant | M |
| P2 (bit 0) | Selection for cutting path method in milling line machining unit | – | Instant | M |
| P2 (bit 1) | Output/no output of spindle rotation command during manual program machining unit | – | Instant | M |
| P2 (bit 2) | Return/no return to the tool change position upon issuance of T-command with the same TNo. but followed by a different suffix | – | Instant | M |
| P2 (bit 3) | | | | |
| P2 (bit 4) | Selection of whether the position of fixed point is to be shifted by an amount of A13 | – | Instant | M |
| P2 (bit 5) | Selection of whether the position of fixed point is to be shifted in the direction of the B-axis by an amount of A13 | – | Instant | M |
| P2 (bit 6) | Selection of an angle margin for nose shape compensation | – | Instant | M |
| P2 (bit 7) | Selection of an angle margin for nose shape compensation | – | Instant | M |
| P3 (bit 0) | Use/disuse of Z offset check | – | Instant | M |
| P3 (bit 1) | Axis designation for TPS operation | – | Instant | M, E |
| P3 (bit 2) | Return/no return to the tool change position upon issuance of T-command with the same TNo. but followed by a different suffix | – | Instant | M |
| P3 (bit 3) | Selection of whether the Y-axial return to zero point is to be executed at the start of a MAZATROL program | – | Instant | M |
| P3 (bit 4) | Selection of the method for approach/escape during mill-line center machining | – | Instant | M |
| P3 (bit 5) | Data auto-setting method selection for TAP/MTP (pipe tapping) | – | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P3 (bit 6) | | | | |
| P3 (bit 7) | Selection of G1 or G0 as the axial relief feed mode for linear machining | – | Instant | M |
| P4 (bit 0) | | | | |
| P4 (bit 1) | Selection of display type of tapping tool in solid mode | – | Instant | M |
| P4 (bit 2) | | | | |
| P4 (bit 3) | | | | |
| P4 (bit 4) | | | | |
| P4 (bit 5) | | | | |
| P4 (bit 6) | | | | |
| P4 (bit 7) | | | | |
| P5 (bit 0) | | | | |
| P5 (bit 1) | | | | |
| P5 (bit 2) | | | | |
| P5 (bit 3) | Spindle synchronizing pattern | – | Instant | M |
| P5 (bit 4) | | | | |
| P5 (bit 5) | | | | |
| P5 (bit 6) | | | | |
| P5 (bit 7) | | | | |
| P6 (bit 0) | Selection of whether immediate indexing of the automatically selected spare tool is to be made valid or invalid | – | Instant | M, E |
| P6 (bit 1) | Selection of the order of spare tool selection | – | Instant | M, E |
| P6 (bit 2) | Tool offset type selection | – | Power OFF → ON | M, E |
| P6 (bit 3) | | | | |
| P6 (bit 4) | Counting all the tools with the same tool number for tool life management on the TOOL DATA display executed/not executed. | – | Instant | M, E |
| P6 (bit 5) | Name/ID No. selection on the TOOL DATA display | – | Instant | M, E |
| P6 (bit 6) | | | | |
| P6 (bit 7) | **VISUAL TOOL MANAGER** display valid/invalid | – | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P7 (bit 0) | | | | |
| P7 (bit 1) | Selection of a shape-drawing position for milling | – | Instant | M |
| P7 (bit 2) | Input digit quantity selection of infeed point coordinate | – | Instant | M |
| P7 (bit 3) | Selection of conditions capable of setting tool data | – | Instant | M, E |
| P7 (bit 4) | JAW SHAPE display name/code selection | – | Instant | M, E |
| P7 (bit 5) | | | | |
| P7 (bit 6) | | | | |
| P7 (bit 7) | | | | |
| P8 (bit 0) | | | | |
| P8 (bit 1) | | | | |
| P8 (bit 2) | | | | |
| P8 (bit 3) | Tool nose position storage function valid/invalid on the TOOL OFFSET display | – | Instant | M, E |
| P8 (bit 4) | | | | |
| P8 (bit 5) | | | | |
| P8 (bit 6) | | | | |
| P8 (bit 7) | Selection of use/disuse of tool identification code skip function | – | Instant | M |
| P9 (bit 0) | Command data execution as it is/at 10 times | – | Instant | E |
| P9 (bit 1) | | | | |
| P9 (bit 2) | Selection of G-code series A | – | Instant | E |
| P9 (bit 3) | Selection of G-code series B | – | Instant | E |
| P9 (bit 4) | | | | |
| P9 (bit 5) | Selection of the command type without decimal point | – | Instant | E |
| P9 (bit 6) | Selection of rapid traverse interpolation method | – | Instant | E |
| P9 (bit 7) | Address E specification in precision thread cutting command | – | Instant | E |
| P10 (bit 0) | Selection of whether short-cutting is to be executed during circular milling (CIR) | – | Instant | M |
| P10 (bit 1) | Selection of whether short-cutting is to be executed during chamfering | – | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P10 (bit 2) | Selection of whether or not dwell command should be specified in time | – | Instant | E |
| P10 (bit 3) | Tool compensation amount selection for EIA/ISO programs | – | Instant | E |
| P10 (bit 4) | Selection of T command digit length | – | Instant | E |
| P10 (bit 5) | Use/disuse of interruption prevention function | – | Instant | E |
| P10 (bit 6) | Selection of return method during deep hole drilling cycle | – | Instant | E |
| P10 (bit 7) | Selection of tool return position at the end of drilling cycle | – | Instant | E |
| P11 (bit 0) | Selection of initial G96 (allowed only in G code series A) | – | Instant | E |
| P11 (bit 1) | Selection of initial G99 (allowed only in G code series A) | – | Instant | E |
| P11 (bit 2) | Selection of initial G90 (allowed only in G code series B and C) | – | Instant | E |
| P11 (bit 3) | | | | |
| P11 (bit 4) | Use/disuse of high speed processing function during machine lock | – | Instant | E |
| P11 (bit 5) | Selection between whether or not intermediate point should be ignored during execution of reference return command | – | Instant | E |
| P11 (bit 6) | Selection of whether the machine is to be brought to a macro single-block stop | – | Instant | E |
| P11 (bit 7) | Absolute/incremental axis name selection | – | Instant | E |
| P12 (bit 0) | Selection of positioning method during fixed cycle | – | Instant | E |
| P12 (bit 1) | Selection of whether or not G50 is used during G53 mode | – | Instant | E |
| P12 (bit 2) | Selection of initial G53 | – | Instant | E |
| P12 (bit 3) | Selection of initial G00 | – | Instant | E |
| P12 (bit 4) | | | | |
| P12 (bit 5) | Selection of M code output at bottom during tapping cycle | – | Instant | E |
| P12 (bit 6) | Selection of the operation occurring during the control of the tool tip point when command G49 is issued (when the tool length offset value is canceled) | – | Instant | E |
| P12 (bit 7) | Selection of coordinate system type for controlling the tool tip point | – | Instant | E |
| P13 (bit 0) | Use/disuse of compensation movement during T command | – | Instant | E |
| P13 (bit 1) | Use/disuse of block stop after restart | – | Instant | E |
| P13 (bit 2) | Use/disuse of automatic return on resuming program | – | Instant | E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P13 (bit 3) | Use/disuse of G00 dry run | – | Instant | M, E |
| P13 (bit 4) | Use/disuse of dry run during thread cutting | – | Instant | M, E |
| P13 (bit 5) | Use/disuse of feed hold during thread cutting | – | Instant | E |
| P13 (bit 6) | | | | |
| P13 (bit 7) | Use/disuse of reverse rotation error prevention function during G46 mode | – | Instant | E |
| P14 (bit 0) | | | | |
| P14 (bit 1) | | | | |
| P14 (bit 2) | | | | |
| P14 (bit 3) | | | | |
| P14 (bit 4) | Whether the workpiece barriers are to be activated | – | Instant | M |
| P14 (bit 5) | Nose R compensation change-over | – | Instant | E |
| P14 (bit 6) | Selection as to handling of leading zeros in the DPRNT command mode | – | Instant | E |
| P14 (bit 7) | Selection of a method of updating data during automatic nose measurement (for EIA) | – | Instant | E |
| P15 (bit 0) | Overriding valid/invalid of the return speed during a synchronous tapping (parameter **K70**) | – | Instant | E |
| P15 (bit 1) | Simplified wear offsetting valid/invalid | – | Instant | M, E |
| P15 (bit 2) | Method of entering tool position offset data in X-axis direction | – | Instant | E |
| P15 (bit 3) | Selection of the minimum data unit for secondary auxiliary functions | – | Instant | E |
| P15 (bit 4) | Address selection for direct input of chamfered corner R curved surface dimensions | – | Instant | E |
| P15 (bit 5) | Selection of whether tool shape offsetting is to be cancelled with offset number 0 | – | Instant | E |
| P15 (bit 6) | Selection of a tool shape offsetting method | – | Instant | E |
| P15 (bit 7) | | | | |
| P16 (bit 0) | Use/disuse of in-position check | – | Instant | M, E |
| P16 (bit 1) | Automatic setting of target data for nose measurement | – | Instant | E |
| P16 (bit 2) | Whether reading/writing of system variables is to be executed during tool pass check | – | Instant | E |
| P16 (bit 3) | EIA format selection | – | Instant | E |
| P16 (bit 4) | Macro interrupt valid/invalid | – | Instant | E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P16 (bit 5) | Selection of the type of interrupt program call for macro interruption | – | Instant | E |
| P16 (bit 6) | Whether local variables are to be cleared by resetting | – | Instant | E |
| P16 (bit 7) | Whether common variables are to be cleared by resetting | – | Instant | E |
| P17 | Selection of tool change position specification code | – | Instant | M |
| P18 | Selection of spare tool indexing condition | – | Instant | M, E |
| P19 | Selection of data unit system mm/inch/highly accurate inch | – | Power OFF → ON | M, E |
| P20 | Measurement retry frequency in C offset measurement process | Times | Instant | M |
| P21 | Selection of separating ratio of GRAPHIC display | – | Instant | M, E |
| P22 | Tool command time for tool path | 0.05 sec | Instant | M |
| P23 | Auxiliary command time for tool path | 0.05 sec | Instant | M |
| P24 | Dwell at groove bottom (number of spindle rotation) | Revolutions | Instant | M |
| P25 | | | | |
| P26 | Selection of escape pattern from wall (90°) in rough cutting cycle | – | Instant | E |
| P27 | Specification of first M code for milling axis gear selection | – | Instant | M |
| P28 | Specification of first M code for spindle gear selection | – | Instant | M |
| P29 | Specification of first M code for parts catcher control | – | Instant | M |
| P30 | Threading chamfering angle | Degree | Instant | E |
| P31 | Simultaneous operation pattern for transfer | – | Instant | M |
| P32 | Threading termination waiting time processing | 3.5 msec | Instant | M |
| P33 | Number of times of roughing in the composite-type fixed cycle (G73) | – | Instant | E |
| P34 | Final finishing repeat times in the composite-type fixed cycle (G76) | – | Instant | E |
| P35 | Maximum workpiece length range 1 on the CUT LEARN display | 1 mm or 0.1 inches | Instant | M |
| P36 | Maximum workpiece length range 2 on the CUT LEARN display | 1 mm or 0.1 inches | Instant | M |
| P37 | Maximum workpiece length range 3 on the CUT LEARN display | 1 mm or 0.1 inches | Instant | M |
| P38 | Maximum workpiece outside diameter range 1 on the CUT LEARN display | 1 mm or 0.1 inches | Instant | M |
| P39 | Maximum workpiece outside diameter range 2 on the CUT LEARN display | 1 mm or 0.1 inches | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P40 | Maximum workpiece outside diameter range 3 on the CUT LEARN display | 1 mm or 0.1 inches | Instant | M |
| P41 | Macro call G code | – | Instant | E |
| P42 | Macro call G code | – | Instant | E |
| P43 | Macro call M code | – | Instant | E |
| P44 | Macro call M code | – | Instant | E |
| P45 | Macro call M code | – | Instant | E |
| P46 | Macro call M code | – | Instant | E |
| P47 | Macro call M code | – | Instant | E |
| P48 | | | | |
| P49 | Macro program number corresponding to P41 | – | Instant | E |
| P50 | Macro program number corresponding to P42 | – | Instant | E |
| P51 | Macro program number corresponding to P43 | – | Instant | E |
| P52 | Macro program number corresponding to P44 | – | Instant | E |
| P53 | Macro program number corresponding to P45 | – | Instant | E |
| P54 | Macro program number corresponding to P46 | – | Instant | E |
| P55 | Macro program number corresponding to P47 | – | Instant | E |
| P56 | | | | |
| P57 | Subprogram call M-code | – | Instant | E |
| P58 | Subprogram call M-code | – | Instant | E |
| P59 | Subprogram call M-code | – | Instant | E |
| P60 | Subprogram number corresponding to P57 | – | Instant | E |
| P61 | Subprogram number corresponding to P58 | – | Instant | E |
| P62 | Subprogram number corresponding to P59 | – | Instant | E |
| P63 | Upward cutting speed for inside threading (THR IN) | mm/min 0.1 inches/min | Instant | M |
| P64 | | | | |
| P65 | Selection about tape operation mode data input | – | Instant | E |
| P66 | Method of judging whether the life of the tool is approaching | – | Instant | M |
| P67 | Criteria for judging whether the life of the tool is approaching | % or minute | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P68 I P72 | | | | |
| P73 | Number of times of pecking up to the return of the tool to a position near the starting point of the #4 or the #[4] very-deep-hole-drilling cycle of a DRP or MDR unit | Times | Instant | M |
| P74 | Tool drawing accuracy in solid mode | – | Instant | M |
| P75 | | | | |
| P76 | Selection of the shape correction function of the MAZATROL program | – | Instant | M |
| P77 | Selection of whether the C-axis on the WORK OFFSET display for the No. 2 spindle is to be made valid or invalid | – | Instant | E |
| P78 I P94 | | | | |
| P95 | Selection of tool change position specification code for FLASH-tool or multi-tool holder | – | Instant | M |
| P96 | | | | |
| P97 | Cutting depth in the composite-type fixed cycle (G71/G72) | 0.001 mm or 0.0001 inches | Instant | E |
| P98 | Amount of escape in an X-axial direction during the composite-type fixed cycle (G73) | 0.001 mm or 0.0001 inches | Instant | E |
| P99 | Amount of escape in a Z-axial direction during the composite-type fixed cycle (G73) | 0.001 mm or 0.0001 inches | Instant | E |
| P100 | Pitch of tapping tool for display in detail in solid mode | 0.001 mm or 0.0001 inches | Instant | M |
| P101 | Thread depth of tapping tool for display in detail in solid mode | 0.001 mm or 0.0001 inches | Instant | M |
| P102 I P104 | | | | |
| P105 (bit 0) | | | | |
| P105 (bit 1) | EIA macroprogram call help function valid/invalid in MAZATROL screen mode | – | Instant | M |
| P105 (bit 2) | Cutting conditions studying function valid or invalid | – | Instant | M |
| P105 (bit 3) | Fixed-amount offset function valid or invalid | – | Instant | M |
| P105 (bit 4) | Whether the movable range of the inclined Y-axis is to be drawn on the TRACE display | – | Instant | M, E |
| P105 (bit 5) | | | | |
| P105 (bit 6) | Text input/output valid/invalid for data I/O | – | Instant | M, E |
| P105 (bit 7) | | | | |
| P106 (bit 0) | Handling when the lives of all the same group number tools are reached in a standard EIA/ISO mode | – | Instant | E |
| P106 (bit 1) | Method of estimating a residual life in standard EIA/ISO mode | – | Instant | E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P106 (bit 2) | Hard disk, floppy disk, and/or memory card input/output Conditions for loading the machining program of the same work number | – | Instant | M, E |
| P106 (bit 3) | Selection of the display mode of ID numbers on the TOOL DATA display - Decimal or hexadecimal display | – | Instant | M, E |
| P106 (bit 4) | | | | |
| P106 (bit 5) | Tool set data protection in the automatic operation mode | – | Instant | M, E |
| P106 (bit 6) | Whether the GRAPHIC MAINTE. display is to be automatically displayed when the specific alarm occurs. | – | Instant | M, E |
| P106 (bit 7) | | | | |
| P107 (bit 0) | Whether workpiece and finishing shape data is to be output during EIA conversion output | – | Instant | M |
| P107 (bit 1) | | | | |
| P107 (bit 2) | Selection of G0/G1 EIA conversion output during the polar coordinate mode (G12.1) | – | Instant | M |
| P107 (bit 3) | Selection of the approach operation for machining with the No. 2 spindle | – | Instant | M |
| P107 (bit 4) | Selection of a FLASH-tool life management method | – | Instant | M, E |
| P107 (bit 5) | Selection of whether to hold spindle status during transfer (TRS) (machine with sub-spindle) | – | Instant | M |
| P107 (bit 6) | Selection of whether to execute the G90/G94 turning cycle when its approach point and ending point match | – | Instant | E |
| P107 (bit 7) | Selection of the Z/C offset to be used for the subprogram when a subprogram call is performed from the MAZATROL program to the EIA program | – | Instant | E |
| P108 (bit 0) | How to handle EOR (%) - M02 or M30 | – | Instant | E |
| P108 (bit 1) | Execution mode selection for a fixed turning cycle | – | Instant | E |
| P108 (bit 2) | Form of single-block stop during a fixed turning cycle | – | Instant | E |
| P108 (bit 3) | T-command compensation | – | Instant | E |
| P108 (bit 4) | Selection of whether to output M30 for a tool whose life has been reached | – | Instant | M, E |
| P108 (bit 5) | Use/disuse of the Z-offset existing when a subprogram call is performed from the MAZATROL program to an EIA/ISO program | – | Instant | E |
| P108 (bit 6) | Selection of modal information reading system variable | – | Instant | E |
| P108 (bit 7) | Selection of output codes for macro external output instructions | – | Instant | M, E |
| P109 (bit 0) | Program protect flag (Whether editing of the programs of the order of WNo. 9000 is to be prohibited) | – | Instant | M, E |
| P109 (bit 1) | Program protect flag (Whether displaying of the programs of the order of WNo. 9000 is to be prohibited) | – | Instant | M, E |
| P109 (bit 2) | Whether to save the data as an additional one during hard disk/floppy disk input/output | – | Instant | M, E |
| P109 (bit 3) | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P109 (bit 4) | Program protect flag (Whether editing of the programs of the order of WNo. 8000 and WNo. 9000 is to be prohibited.) | – | Instant | M, E |
| P109 (bit 5) | Program protect flag (Whether displaying of the programs of the order of WNo. 8000 and WNo. 9000 is to be prohibited.) | – | Instant | M, E |
| P109 (bit 6) | Selection of an alarm checking method for data input/output program saving | – | Instant | M, E |
| P109 (bit 7) | Selection of the jaw data reference method | – | Instant | M, E |
| P110 (bit 0) | Power-on display selection | – | Instant | M, E |
| P110 (bit 1) | Page extension on the MAINTENANCE CHECK display | – | Instant | M, E |
| P110 (bit 2) | When the visual tool ID/data management functions are valid – Stored tools registration function on the VISUAL TOOL MANAGER display valid/invalid | – | Instant | M, E |
| P110 (bit 3) | | | | |
| P110 (bit 4) | | | | |
| P110 (bit 5) | | | | |
| P110 (bit 6) | Tool length input valid/invalid | – | Instant | M, E |
| P110 (bit 7) | | | | |
| P111 (bit 0) | M-command execution time processing during time study of tool path checking | – | Instant | M, E |
| P111 (bit 1) | T-command execution time processing during time study of tool path checking | – | Instant | M, E |
| P111 (bit 2) | Upward cutting speed valid/invalid for inside threading (THR IN) | – | Instant | M |
| P111 (bit 3) | | | | |
| P111 (bit 4) | | | | |
| P111 (bit 5) | Using angle tool holder valid/invalid | – | Instant | M, E |
| P111 (bit 6) | EIA tool command suffix valid/invalid | – | Instant | E |
| P111 (bit 7) | Selection of the method of moving axes to the tool change position (P7 and P95) | – | Instant | M |
| P112 (bit 0) | Selection of measurement data items to be printed out - Work No., process No. | – | Instant | M, E |
| P112 (bit 1) | Selection of measurement data items to be printed out - Tool No., work counter | – | Instant | M, E |
| P112 (bit 2) | Selection of measurement data items to be printed out - Measurement mode | – | Instant | M, E |
| P112 (bit 3) | Selection of measurement data items to be printed out - Target data | – | Instant | M, E |
| P112 (bit 4) | Selection of measurement data items to be printed out - Measurement data | – | Instant | M, E |
| P112 (bit 5) | Selection of measurement data items to be printed out - Offset data | – | Instant | M, E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| P112 (bit 6) | Selection of measurement data items to be printed out<br>- Tolerance upper/lower | – | Instant | M, E |
| P112 (bit 7) | Selection of measurement data items to be printed out<br>- Day and time of measurement | – | Instant | M, E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| K1 | Cut depth reduction rate for rough cutting in bar machining unit | % | Instant | M |
| K2 | Acceleration rate in up<br>- going taper for rough cutting in bar machining unit | % | Instant | M |
| K3 | Acceleration rate in<br>- up-going wall slope (90°) for rough cutting in bar machining unit | % | Instant | M |
| K4 | Deceleration rate in down<br>- going taper for rough cutting in bar machining unit | % | Instant | M |
| K5 | Deceleration rate in down<br>- going wall slope (90°) for rough cutting in bar machining unit | % | Instant | M |
| K6 | Acceleration rate on outside stock contour for rough cutting in copy machining unit | % | Instant | M |
| K7 | | | | |
| K8 | Rough cutting residue ratio in cutting off cycle | % | Instant | M |
| K9 | Deceleration ratio for automatic corner overriding | % | Instant | E |
| K10 | Cut depth allowable incremental rate for rough cutting in groove, edge and copy machining unites | % | Instant | M |
| K11 | Deceleration rate at cutting start time in drilling unit | % | Instant | M |
| K12 | Deceleration rate at cutting end time in drilling unit | % | Instant | M |
| K13 | Deceleration rate at rough cutting start time (BAR, CPY) | % | Instant | M |
| K14 | Maximum permissible rate of increase of the initial cutting depth during BAR roughing | % | Instant | M |
| K15 | Pitch error correction during threading acceleration | 0.001 mm | Instant | M |
| K16 | | | | |
| K17 | Drilling cut depth calculation coefficient | % | Instant | M |
| K18 | Reamer return speed calculation coefficient | % | Instant | M |
| K19 | Chamfering data calculation coefficient in thread cutting unit | Lead/10 | Instant | M, E |
| K20 | Incomplete threading portion length calculation coefficient for tap tip | Pitch/10 | Instant | M |
| K21 | Tapper elongation calculation coefficient | Pitch/10 | Instant | M |
| K22 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| K23 | Calculation coefficient for axial feedrate of milling line machining | % | Instant | M |
| K24 | Thread height calculation coefficient for outside diameter, face/rear thread cutting (metric) | 0.01 % | Instant | M |
| K25 | Thread height calculation coefficient for inside diameter thread cutting (metric) | 0.01 % | Instant | M |
| K26 | Thread height calculation coefficient for outside diameter, face/rear thread cutting (inch) | 0.01 % | Instant | M |
| K27 | Thread height calculation coefficient for inside diameter thread cutting (inch) | 0.01 % | Instant | M |
| K28 | | | | |
| K29 | Feedrate calculation reference diameter in mill drilling unit | 0.1 mm or 0.01 inches | Instant | M |
| K30 | Feedrate calculation reference diameter in mill boring unit | 0.1 mm or 0.01 inches | Instant | M |
| K31 | Radial direction feedrate calculation reference diameter for rough cutting in milling line machining unit | 0.1 mm or 0.01 inches | Instant | M |
| K32 | Radial direction feedrate calculation reference diameter for finish cutting in milling line machining unit | 0.1 mm or 0.01 inches | Instant | M |
| K33 | Polishing margin width for #1 to #3 | 0.001 mm or 0.0001 inches | Instant | M |
| K34 | Polishing margin depth for #1 to #3 | 0.001 mm or 0.0001 inches | Instant | M |
| K35 | Polishing margin width for #4 | 0.001 mm or 0.0001 inches | Instant | M |
| K36 | Polishing margin depth for #4 | 0.001 mm or 0.0001 inches | Instant | M |
| K37 | Polishing margin width for #5 | 0.001 mm or 0.0001 inches | Instant | M |
| K38 | Polishing margin depth for #5 | 0.001 mm or 0.0001 inches | Instant | M |
| K39 | Polishing margin width for #6 | 0.001 mm or 0.0001 inches | Instant | M |
| K40 | Polishing margin depth for #6 | 0.001 mm or 0.0001 inches | Instant | M |
| K41 | Rate of adjustment of the axial cutting/relief feedrate during linear milling | % | Instant | M |
| K42 | Distance from the ending point of a mill-drilling unit (MDR) where the feedrate is to be modified | 0.001 mm or 0.0001 inches | Instant | M |
| K43 | Radial clearance for circular milling | 0.001 mm or 0.0001 inches | Instant | M |
| K44 | | | | |
| K45 | Reference diameter for calculating the circular milling radial feedrate | 0.1 mm or 0.01 inches | Instant | M |
| K46 | Coefficient for calculating the circular milling axial feedrate | % | Instant | M |
| K47 | Selection of position for output of reciprocating rotation M code milling tapping (asynchronous) | – | Instant | M, E |
| K48 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| K49 | Selection of manual feed per revolution or per minute | – | Instant | M, E |
| K50 | Direction of rotation of the C-axis during C-axial threading with G01.1 | – | Instant | E |
| K51 | Selection of whether to move the tool past a clearance point immediately before executing move command of the turning/milling manual program machining unit that follows I. D. machining | – | Instant | M |
| K52 I K54 | | | | |
| K55 | Selection of a shape definition method for the Z-C plane in a linear machining unit | – | Instant | M |
| K56 | | | | |
| K57 | Method of nose R offsetting during finishing with EIA conversion output | – | Instant | E |
| K58 | Language selection | – | Power OFF → ON | M, E |
| K59 | | | | |
| K60 (bit 0) | Data entry for communication with the magazine-side display unit (Serial port) | – | Power OFF → ON | M, E |
| K60 (bit 1) | Data entry for communication with the magazine-side display unit (Serial port) | – | Power OFF → ON | M, E |
| K60 (bit 2) | Data entry for communication with the magazine-side display unit (Communication setting file) | – | Power OFF → ON | M, E |
| K60 (bit 3) | | | | |
| K60 (bit 4) | Data entry for communication with the magazine-side display unit (Type of ID amplifier) | – | Power OFF → ON | M, E |
| K60 (bit 5) | Data entry for communication with the magazine-side display unit (Type of ID amplifier) | – | Power OFF → ON | M, E |
| K60 (bit 6) | Data entry for communication with the magazine-side display unit (R-register) | – | Power OFF → ON | M, E |
| K60 (bit 7) | Data entry for communication with the magazine-side display unit (R-register) | – | Power OFF → ON | M, E |
| K61 I K64 | | | | |
| K65 | Selection of a cylindrical interpolation rotational axis for cylindrical interpolation plane selection | – | Instant | E |
| K66 | | | | |
| K67 | Angle of the tool nose during the G76 mode | Degree | Instant | E |
| K68 | Number of common variables between turrets (#100 onward) | – | Instant | E |
| K69 | Number of common variables between turrets (#500 onward) | – | Instant | E |
| K70 | Return speed overriding during a synchronous tapping | % | Instant | E |
| K71 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| K72 | Tool registration quantity pattern on the TOOL LIFE display | – | Instant | E |
| K73 | | | | |
| K74 | Number of cutting edges of a FLASH-tool for milling<br>(Only when using a tool not specified in the TOOL FILE display) | – | Instant | M, E |
| K75 | Selection about planetary tapping chip ejection | – | Instant | M |
| K76 | Reduction ratio for the G00-based relief rate during a very-deep-hole drilling cycle | % | Instant | M |
| K77 | Dwell at the hole bottom during a DRL or MDR unit | Revolutions | Instant | M |
| K78<br>I<br>K80 | | | | |
| K81 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K82 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K83 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K84 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K85 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K86 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K87 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K88 | CODE — Macro call G-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K89 | CODE — Macro call M-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K90 | CODE — Macro call M-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K91 | CODE — Macro call M-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K92 | CODE — Macro call M-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K93 | CODE — Macro call M-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K94 | CODE — Macro call S-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K95 | CODE — Macro call T-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |
| K96 | CODE — Macro call B-code<br>NUM. — Corresponding macroprogram number | – | Instant | E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| U1 | Tool turning clearance in X-axis | 0.001 mm or 0.0001 inches | Instant | M |
| U2 | Tool turning clearance in Z-axis | 0.001 mm or 0.0001 inches | Instant | M |
| U3 | Safety contour clearance - Outside diameter clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U4 | Safety contour clearance - Inside diameter clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U5 | Safety contour clearance - Front clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U6 | Safety contour clearance - Back clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U7 | Thread cutting clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U8 | Groove cutting clearance in X-axis | 0.001 mm or 0.0001 inches | Instant | M |
| U9 | Groove cutting clearance in Z-axis | 0.001 mm or 0.0001 inches | Instant | M |
| U10 | Milling line right/left cutting clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U11 | Workpiece transfer clearance | 0.001 mm or 0.0001 inches | Instant | M |
| U12 | Amount of edge clearance after EDG roughing | 0.001 mm or 0.0001 inches | Instant | M |
| U13 | Radial finishing allowance for Y-axis mill-grooving unit (MGV) | % | Instant | M |
| U14 | Amount of overlapping for Y-axis mill-grooving unit (MGV) | 0.001 mm or 0.0001 inches | Instant | M |
| U15 I U17 | | | | |
| U18 | Return speed at pecking portion in groove cutting, drilling unit | 0.001 mm/rev or 0.0001 inches/rev | Instant | M |
| U19 | Feedrate specification reference speed for finish cutting in milling line machining unit | 0.001 mm/rev or 0.0001 inches/rev | Instant | M |
| U20 | | | | |
| U21 | Measurement skip feedrate (X-axis, Z-axis) | mm/min or 0.1 inches/min | Instant | M |
| U22 | Measurement approach speed (X-axis, Z-axis) | mm/min or 0.1 inches/min | Instant | M |
| U23 | Measurement skip speed (C-axis) | mm/min or 0.1 inches/min | Instant | M |
| U24 | Measurement approach speed (C-axis) | mm/min or 0.1 inches/min | Instant | M |
| U25 | Approaching speed for TPS function | mm/min or 0.1 inches/min | Instant | M |
| U26 | Workpiece pressing speed in workpiece transfer unit (TPS) | mm/min or 0.1 inches/min | Instant | M |
| U27 | Revolution number ($min^{-1}$) of two spindles in workpiece transfer unit | $min^{-1}$ (rpm) | Instant | M |
| U28 | Feedrate for escape by short distance | mm/min or 0.1 inches/min | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| U29 | Maximum angle for automatic corner overriding | Degree | Instant | E |
| U30<br>I<br>U32 | | | | |
| U33 | Return distance in X-axis at wall during rough cutting | 0.001 mm or 0.0001 inches | Instant | M |
| U34 | Return distance in Z-axis at wall during rough cutting<br>Return distance after cutting in the rough-cutting cycle (G71, G72) | 0.001 mm or 0.0001 inches | Instant | M, E |
| U35 | Cut depth per cycle for machining inside diameter | 0.001 mm or 0.0001 inches | Instant | M |
| U36 | Reverse feed tolerance for contour machining | 0.001 mm or 0.0001 inches | Instant | M |
| U37 | Overtravelling in X-axis direction in edge machining unit | 0.001 mm or 0.0001 inches | Instant | M |
| U38 | Acceleration distance clamp value for thread cutting unit | Lead/10 | Instant | M |
| U39 | Cut depth for final cut in thread cutting unit | 0.001 mm or 0.0001 inches | Instant | M, E |
| U40 | | | | |
| U41 | Pecking return distance in groove cutting unit | 0.001 mm or 0.0001 inches | Instant | M, E |
| U42 | Overlap distance in groove cutting unit | 0.001 mm or 0.0001 inches | Instant | M |
| U43 | Escape value after machining in edge machining unit | 0.001 mm or 0.0001 inches | Instant | M |
| U44 | Drilling depth decrement | 0.001 mm or 0.0001 inches | Instant | M |
| U45 | Pecking return distance in drilling unit | 0.001 mm or 0.0001 inches | Instant | M, E |
| U46 | Drilling cut depth clamp value | 0.001 mm or 0.0001 inches | Instant | M |
| U47 | Escape value after milling spindle orientating at hole bottom in boring unit | 0.001 mm or 0.0001 inches | Instant | M |
| U48 | Distance of deceleration for automatic corner overriding | 0.001 mm or 0.0001 inches | Instant | E |
| U49 | Tolerance for radial value difference in arc command | 0.001 mm or 0.0001 inches | Instant | E |
| U50 | Workpiece pressing distance in workpiece transfer unit | 0.001 mm or 0.0001 inches | Instant | M |
| U51 | Deceleration clearance at start of rough cutting in bar and copy machining unit | 0.001 mm or 0.0001 inches | Instant | M |
| U52 | Tolerance for escape in high speed rough cutting cycle in bar machining unit | 0.001 mm or 0.0001 inches | Instant | M |
| U53 | Minimum overlap distance in mill-grooving unit (MGV) and circular milling unit (CIR) | 0.001 mm or 0.0001 inches | Instant | M |
| U54 | Spindle revolution clamp value in cutting off cycle | $min^{-1}$ (rpm) | Instant | M |
| U55 | Number of times of finishing when #0 is selected in threading unit | Times | Instant | M |
| U56 | Number of times that feedrate is to be reduced during the #4 and #5 cutting cycle of a grooving unit | Times | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| U57 | Specification of measuring tolerance (lower limit) | % | Instant | M, E |
| U58 | Specification of measuring tolerance (upper limit) | % | Instant | M, E |
| U59 | Measurement stroke for workpiece measurement | 0.001 mm or 0.0001 inches | Instant | M |
| U60 | Measurement stroke for tool nose measurement | 0.001 mm or 0.0001 inches | Instant | M |
| U61 | Coefficient to determine rotation angle when retrying measurement in C offset measurement unit | % | Instant | M |
| U62 | Feed override for the section to be chamfered for planetary tapping cycle | % | Instant | M |
| U63 | Amount of escape at hole bottom for planetary tapping cycle | 0.1 thread | Instant | M |
| U64 | Specification of automatic pre-holing feed rate value for planetary tapping cycle | 0.01 mm/rev or 0.001 inch/rev | Instant | M |
| U65 | Delay timer of M code for the parts catcher (headstock 1) | msec | Instant | M |
| U66 | Delay timer of M code for the parts catcher (headstock 2) | msec | Instant | M |
| U67 | M-code value for making shape correction valid in the MAZATROL program | – | Instant | M |
| U68 | M-code value for making shape correction invalid in the MAZATROL program | – | Instant | M |
| U69 | | | | |
| U70 | | | | |
| U71 | Selection of transfer pattern (TRS) | – | Instant | M |
| U72 I U74 | | | | |
| U75 | Timer setting for manual TOOL EYE measurement | 7.1 msec | Instant | M, E |
| U76 | | | | |
| U77 | | | | |
| U78 | Selection as to tool life management alarm display | – | Instant | M, E |
| U79 | Setting range of MTP dwell time data | msec | Instant | M |
| U80 | | | | |
| U81 | Raw jaw forming workpiece length | 0.001 mm or 0.0001 inches | Instant | M |
| U82 | Specification of automatic feed rate value for planetary tapping cycle | 0.01 mm/rev or 0.001 inch/rev | Instant | M |
| U83 | Height of the second referential point during the Tornado cycle | 0.001 mm or 0.0001 inches | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| U84<br>I<br>U95 | | | | |
| U96 | | | | |

According to machine used, parameters D and E are not specified.

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| D1 | Height of the second referential point during point machining | 0.001 mm or 0.0001 inches | Instant | M |
| D2 | Nominal diameter of spot-machining tool | 1 mm or 0.1 inches | Instant | M |
| D3 | Spot-machining hole bottom dwell time element | Revolution | Instant | M |
| D4 | Maximum allowable spot-chamfering hole diameter element | 0.1 mm or 0.01 inches | Instant | M |
| D5 | Prehole through speed during inversed spot-facing | 1 mm/min 0.1 inch/min | Instant | M |
| D6 | Drill-machining cycle setting element | – | Instant | M |
| D7 | Drill-machining cycle setting element | – | Instant | M |
| D8 | Maximum diameter of holes machinable on one drill | 1 mm or 0.1 inches | Instant | M |
| D9 | Maximum diameter of holes machinable on two drills | 1 mm or 0.1 inches | Instant | M |
| D10 | Maximum diameter of holes machinable on three drills | 1 mm or 0.1 inches | Instant | M |
| D11 | Through-hole/Tap-prehole machining overshoot | 0.1 mm or 0.01 inches | Instant | M |
| D12 | Stop-hole machining hole-bottom clearance | 0.1 mm or 0.01 inches | Instant | M |
| D13 | Spot-machining hole diameter (fixed value) | 1 mm or 0.1 inches | Instant | M |
| D14 | Depth-of-cut setting element for drilling (ALMINUM) | 0.1 | Instant | M |
| D15 | Depth-of-cut setting element for drilling (except AL) | 0.1 | Instant | M |
| D16 | Hole-bottom dwell time for chamfering cutter | Revolution | Instant | M |
| D17 | Interference clearance of chamfering cutter | 0.001 mm 0.0001 inches | Instant | M |
| D18 | Return feedrate for reaming or boring (cycle 3) | 1 mm/min or 0.1 inch/min | Instant | M |
| D19 | Hole-bottom dwell time for end milling | Revolution | Instant | M |
| D20 | Radial depth-of-cut setting element for end milling | % | Instant | M |
| D21 | Reference bottom-finishing allowance for end milling | 0.001 mm or 0.0001 inches | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| D22 | Tapping-cycle dwell time | 0.01 sec | Instant | M |
| D23 | | | | |
| D24 | Hole bottom dwell time for boring | Revolution | Instant | M |
| D25 | | | | |
| D26 | Boring or back-boring hole-bottom return | 0.001 mm or 0.0001 inch | Instant | M |
| D27 | | | | |
| D28 | Bottom-finishing amount of boring | 0.001 mm or 0.0001 inches | Instant | M |
| D29 I D32 | | | | |
| D33 | Back-boring tool tip relief | 0.001 mm or 0.0001 inches | Instant | M |
| D34 | | | | |
| D35 | Prehole-drilling diameter setting element for reamer (drilling) | 0.01 mm or 0.001 inch | Instant | M |
| D36 | Prehole-drilling diameter setting element for reamer (boring) | 0.01 mm or 0.001 inches | Instant | M |
| D37 | Prehole-drilling diameter setting element for reamer (end milling) | 0.01 mm or 0.001 inches | Instant | M |
| D38 | Machining hole diameter setting element for boring tool or end mill in the reamer unit | 0.01 mm or 0.001 inches | Instant | M |
| D39 | Machining hole diameter setting element for end mill in the reamer unit | 0.01 mm or 0.001 inches | Instant | M |
| D40 | Spot-faced hole bottom dwell time for inversed spot-facing | Revolution | Instant | M |
| D41 | | | | |
| D42 | Height of the third referential point during point machining | 0.001 mm or 0.0001 inches | Instant | M |
| D43 | Number of incomplete threads in tapping cycle | pitch/10 | Instant | M |
| D44 | Automatic calculation method for the amount of chamfering using the tapping unit | – | Instant | M |
| D45 | Amount of mill-drilling depth attenuation | 0.001 mm or 0.0001 inches | Instant | M |
| D46 | Mill-drilling depth clamping value | 0.001 mm or 0.0001 inches | Instant | M |
| D47 | Reamer-prehole machining overshoot | 0.01 mm or 0.001 inches | Instant | M |
| D48 I D72 | | | | |
| D73 I D77 | Learning of cutting conditions (DEP-A range) | – | Instant | M |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| D78 to D82 | Learning of cutting conditions (WID-R range) | – | Instant | M |
| D83 to D90 | | | | |
| D91 (bit 0) | | | | |
| D91 (bit 1) | | | | |
| D91 (bit 2) | | | | |
| D91 (bit 3) | | | | |
| D91 (bit 4) | | | | |
| D91 (bit 5) | | | | |
| D91 (bit 6) | Set the referential point height of the drill as **D1** or **D42** if a spot drill/drill is included in the pre-machining tool sequence of the same unit. | – | Instant | M |
| D91 (bit 7) | Set the referential point height of the chamfering cutter during the cycle 2 as **D42**. | – | Instant | M |
| D92 (bit 0) | Use **K41** for axial feed during a true-circle processing (end milling) cycle. | – | Instant | M |
| D92 (bit 1) | Set the referential point 1 height of the back spot facing as **D1**. | – | Instant | M |
| D92 (bit 2) | Set the referential point height of the reamer as **D1** if a chamfering cutter is included in the premachining tool sequence of the same unit. | – | Instant | M |
| D92 (bit 3) | | | | |
| D92 (bit 4) | | | | |
| D92 (bit 5) | | | | |
| D92 (bit 6) | | | | |
| D92 (bit 7) | | | | |
| D93 to D94 | | | | |
| D95 (bit 0) | Data auto-setting method selection for pipe tapping | – | Instant | M |
| D95 (bit 1) | Data auto-setting method selection for unified tapping | – | Instant | M |
| D95 (bit 2) | Data auto-setting method selection for metric tapping | – | Instant | M |
| D95 (bit 3) | | | | |
| D95 (bit 4) | | | | |
| D95 (bit 5) | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| D95 (bit 6) | | | | |
| D95 (bit 7) | | | | |
| D95 (bit 8) | | | | |
| D96 I D108 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| E1 | Closed-pattern cutting start point and escape point setting element | 0.001 mm or 0.0001 inches | Instant | M |
| E2 | | | | |
| E3 | | | | |
| E4 | Reference allowance of finishing in radial direction | 0.001 mm or 0.0001 inches | Instant | M |
| E5 | Element used to set the cutting start point and escape point (the second clearance) | 0.001 mm or 0.0001 inches | Instant | M |
| E6 | Reference allowance of finishing in axial direction | 0.001 mm or 0.0001 inches | Instant | M |
| E7 | Allowance of cutting start point in axial direction (the second clearance) | 0.001 mm or 0.0001 inches | Instant | M |
| E8 | Radial interference clearance of chamfering cutter | 0.001 mm or 0.0001 inches | Instt | M |
| E9 | | | | |
| E10 | Depth-of-cut-R automatic setting element (Face milling, End milling-top, End milling-step) | 10% | Instant | M |
| E11 | Axial interference clearance of chamfering cutter | 0.001 mm or 0.0001 inches | Instant | M |
| E12 | Radial interference clearance of face milling unit and angular face milling unit | 0.001 mm or 0.0001 inches | Instant | M |
| E13 | Tool path setting element for end milling-top unit | 10% | Instant | M |
| E14 | Depth-of-cut-R automatic setting element (Pocket milling, Pocket milling-mountain, Pocket milling-valley) | 10% | Instant | M |
| E15 | Tool path setting element for face milling-top unit (reciprocating short) | 10% | Instant | M |
| E16 | | | | |
| E17 | Axial cutting feed override | 10% | Instant | M |
| E18 | Override in case of the overall width cutting for pocket-machining | 10% | Instant | M |
| E19 I E20 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| E21 | Overlapping depth during wall cutting in a closed pattern | 0.001 mm or 0.0001 inches | Instant | M |
| E22 I E91 | | | | |
| E92 | Tool-path pattern selection for pocket milling unit | – | Instant | M |
| E93 | | | | |
| E94 | | | | |
| E95 | Tool-path pattern selection for line-machining unit | – | Instant | M |
| E96 | Tool-path pattern selection for end milling-slot unit | – | Instant | M |
| E97 | Tool-path pattern selection for end milling-top unit | – | Instant | M |
| E98 I E108 | | | | |

## 2-2 MACHINE PARAMETER

**Note:** M: Valid only for MAZATROL Program
E: Valid only for EIA/ISO Program

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| A1 | Maximum rapid traverse speed | mm/min (0.1 inches/min) or deg/min | Instant | M, E |
| A2 | Clamping value for the cutting feedrate during tool tip point control | mm/min (0.1 inches/min) or deg/min | Instant | M, E |
| A3 | Origin return speed | mm/min (0.1 inches/min) or deg/min | Instant | M, E |
| A4 | Cutting feedrate clamp value, thread chamfering feedrate | mm/min (0.1 inches/min) or deg/min | Instant | M, E |
| A5 | Fixed point return position | 0.001 mm 0.0001 inches 0.001 deg | Instant | M, E |
| A6 | Tool tip measurement tool change position | 0.001 mm or 0.0001 inches | Instant | M, E |
| A7 | Workpiece origin (fixed point) coordinate | 0.001 mm or 0.0001 inches | Instant | E |
| A8 | Machine reference position | 0.001 mm or 0.0001 inches | Instant | M, E |
| A9 | Soft limit upper end | 0.001 mm or 0.0001 inches | Instant | M, E |
| A10 | Soft limit lower end | 0.001 mm or 0.0001 inches | Instant | M, E |
| A11 | Single direction positioning shift distance | 0.001 mm or 0.0001 inches | Instant | M, E |
| A12 | Handle interruption clamp data | 0.001 mm or 0.0001 inches | Instant | M, E |
| A13 | Origin point dog shift distance | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| A14 | Machine position shift distance | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| A15 | Floating reference point | 0.001 mm or 0.0001 inches | Instant | E |
| A16 | Amount of watchdog-less origin shift | 0.001 mm 0.0001 inches 0.001 deg | Instant | M, E |
| A17 | Feed forward gain | % | Instant | M, E |
| A18 (bit 0) | Selection of a linear-type rotational axis | – | Power OFF → ON | M, E |
| A18 (bit 1) | Selection as to how to determine the rotational direction of the rotational axis | – | Power OFF → ON | M, E |
| A18 (bit 2) | | | | |
| A18 (bit 3) | | | | |
| A18 (bit 4) | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| A18 (bit 5) | | | | |
| A18 (bit 6) | | | | |
| A18 (bit 7) | | | | |
| A19 I A24 | | | | |
| A25 | Setting the upper limit data of Stored Stroke Limit II | 0.001 mm or 0.0001 inches | After travelling stop | M, E |
| A26 | Setting the lower limit data of Stored Stroke Limit II | 0.001 mm or 0.0001 inches | After travelling stop | M, E |
| A27 | Rear-turret machine coordinate origin (Dual-turret specs. only) | 0.001 mm or 0.0001 inches | After travelling stop | M, E |
| A28 | | | | |
| A29 | Illegal axis area - Setting the upper limit (Type A), (Type B), (Type C) | 0.001 mm or 0.0001 inches | Instant | M, E |
| A30 | Illegal axis area - Setting the lower limit (Type A), (Type B), (Type C) | 0.001 mm or 0.0001 inches | Instant | M, E |
| A31 | Reference position of tool offsetting | 0.001 mm or 0.0001 inches | Instant | M, E |
| A32 | X-axial distance from the center of the B-axis to that of the C-axis at the time of arrival at the home position | – | Instant | E |

- The Machine Parameter is found with each head or tool post.
- Display of the Machine parameter is changed by HEAD SELECT key or TURRET SELECT key on the operation board in case of 4/6 axis type machine.

*H1: No. 1 spindle head
*H2: No. 2 spindle head

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B1 | ○ | ○ | Tool head No. (#1) | – | Instant | M, E |
| B2 | ○ | ○ | Number of tools (#1) | – | Instant | M, E |
| B3 | ○ | ○ | Tool head No. (#2) | – | Instant | M, E |
| B4 | ○ | ○ | Number of tools (#2) | – | Instant | M, E |
| B5 | ○ | ○ | Tool head No. (#3) | – | Instant | M, E |
| B6 | ○ | ○ | Number of tools (#3) | – | Instant | M, E |
| B7 | ○ | ○ | Tool head No. (#4) | – | Instant | M, E |
| B8 | ○ | ○ | Number of tools (#4) | – | Instant | M, E |
| B9 | ○ | ○ | Tool head No. (#5) | – | Instant | M, E |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B10 | ○ | ○ | Number of tools (#5) | – | Instant | M, E |
| B11 | ○ | ○ | Number of turret pockets | – | Instant | M, E |
| B12 | | | | | | |
| B13 | | | | | | |
| B14 | ○ | ○ | Selection of reference tool in updating data method during automatic nose measurement (for EIA) | – | Instant | E |
| B15 | ○ | ○ | Reference tool No. | – | Instant | M, E |
| B16 | ○ | ○ | Reference tool suffix | – | Instant | M, E |
| B17 | ○ | ○ | Direction of N° orientation indexing | – | Instant | M, E |
| B18 | ○ | ○ | Number of pins to be driven for N° orientation | – | Instant | M, E |
| B19 | ○ | ○ | Angular direction of spindle orientation on headstock 1 (Angular direction of spindle orientation on headstock 2) | – | Power OFF → ON | M, E |
| B20 I B28 | | | | | | |
| B29 | ○ | ○ | Selecting Type A/Type B of illegal axis area limits | – | Instant | M, E |
| B30 | | | | | | |
| B31 | ○ | ○ | Name of the fourth axis | ASCII by decimal digit | Instant | M, E |
| B32 | ○ | ○ | Name of the fifth axis | ASCII by decimal digit | Instant | M, E |
| B33 | ○ | ○ | Chuck outside diameter | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B34 | ○ | ○ | Chuck width | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B35 | ○ | ○ | Chuck inside diameter | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B36 | | | | | | |
| B37 | ○ | ○ | Tail body outside diameter | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B38 | ○ | ○ | Tail body length | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B39 | ○ | ○ | Tail spindle outside diameter | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B40 | ○ | ○ | Length with tail spindle at back end | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B41 | ○ | ○ | Tail head outside diameter | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B42 | ○ | ○ | Tail head length | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B43 | ○ | ○ | Tail head taper angle | 0.001 deg | Power OFF → ON | M, E |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B44 | ○ | ○ | Tail head biting diameter | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B45 | ○ | ○ | Tool post radius | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B46 | ○ | ○ | Tool post width | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B47 | ○ | ○ | Tool post reference position in X-axis direction | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B48 | ○ | ○ | Tool post reference position in Z-axis direction | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B49 | ○ | ○ | Tool holder (type 1) mounting position | 0.001 mm or 0.0001 inches | Instant | M |
| B50 | ○ | ○ | Tool holder (type 1) width in X-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B51 | ○ | ○ | Tool holder (type 1) width in Z-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B52 | ○ | ○ | Tool holder (type 2) mounting position | 0.001 mm or 0.0001 inches | Instant | M |
| B53 | ○ | ○ | Tool holder (type 2) width in X-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B54 | ○ | ○ | Tool holder (type 2) width in Z-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B55 | ○ | ○ | Tool holder (type 3) mounting position | 0.001 mm or 0.0001 inches | Instant | M |
| B56 | ○ | ○ | Tool holder (type 3) width in X-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B57 | ○ | ○ | Tool holder (type 3) width in Z-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B58 | ○ | ○ | Tool holder (type 4) mounting position | 0.001 mm or 0.0001 inches | Instant | M |
| B59 | ○ | ○ | Tool holder (type 4) width in X-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B60 | ○ | ○ | Tool holder (type 4) width in Z-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B61 | ○ | ○ | Tool nose measurement sensor width in X-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B62 | ○ | ○ | Tool nose measurement sensor width in Z-axis direction | 0.001 mm or 0.0001 inches | Instant | M |
| B63 | ○ | ○ | Tool nose measurement sensor mounting position in X-axis | 0.001 mm or 0.0001 inches | Instant | M |
| B64 | ○ | ○ | Tool nose measurement sensor mounting position in Z-axis | 0.001 mm or 0.0001 inches | Instant | M |
| B65 | | | | | | |
| B66 | ○ | ○ | Workpiece measurement sensor diameter compensation data for outside diameter measurement and projection width measurement | 0.001 mm or 0.0001 inches | Instant | M |
| B67 | ○ | ○ | Workpiece measurement sensor diameter compensation data for inside diameter measurement and groove width measurement | 0.001 mm or 0.0001 inches | Instant | M |
| B68 | ○ | ○ | Position of separating plate | 0.001 mm or 0.0001 inches | Instant | M |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B69 | ○ | | Chuck outside diameter of No. 2 spindle (twin spindle specs. only) | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B70 | ○ | | Chuck width of No. 2 spindle (twin spindle specs. only) | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B71 | ○ | | Chuck inside diameter of No. 2 spindle (twin spindle specs. only) | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B72 | ○ | ○ | Z-coordinate of turret reference position with respect to spindle edge | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B73 | ○ | ○ | X-coordinate of tool path start point on the TOOL PATH CHECK display | 0.001 mm or 0.0001 inches | Instant | M, E |
| B74 | ○ | ○ | Z-coordinate of tool path start point on the TOOL PATH CHECK display | 0.001 mm or 0.0001 inches | Instant | M, E |
| B75 | ○ | ○ | Spindle limit speed 1 selection for spindle position control time constant | Revolution | Power OFF → ON | M, E |
| B76 | ○ | ○ | Spindle limit speed 2 selection for spindle position control time constant | Revolution | Power OFF → ON | M, E |
| B77 | ○ | ○ | Spindle limit speed 3 selection for spindle position control time constant | Revolution | Power OFF → ON | M, E |
| B78 | ○ | ○ | Spindle position control time constant 1 | 0.001 sec | Power OFF → ON | M, E |
| B79 | ○ | ○ | Spindle position control time constant 2 | 0.001 sec | Power OFF → ON | M, E |
| B80 | ○ | ○ | Spindle position control time constant 3 | 0.001 sec | Power OFF → ON | M, E |
| B81 (bit 0) | ○ | ○ | EIA barrier selection - Tail to be used or not | – | Instant | E |
| B81 (bit 1) | ○ | ○ | EIA barrier selection - Holder present or not | – | Instant | E |
| B81 (bit 2) | ○ | ○ | EIA barrier selection - Main chuck outer or inner jaw | – | Instant | E |
| B81 (bit 3) | ○ | ○ | EIA barrier selection - Sub-chuck outer or inner jaw | – | Instant | E |
| B82 | ○ | ○ | M-code for spindle forward rotation during a fixed hole-drilling cycle | – | Power OFF → ON | E |
| B83 | ○ | ○ | M-code for spindle reverse rotation during a fixed hole-drilling cycle | – | Power OFF → ON | E |
| B84 | ○ | ○ | T-command pre-reading valid/invalid, selection of whether to display tail information, stand by M-code pre-reading valid/invalid, pre-reading the block immediately succeeding the M00/M01 code valid/invalid, bar feeder schedule function valid/invalid, NC powered tailstock valid/invalid, and selection of whether to display tail thrust in pounds (lbs) | – | Power OFF → ON | M, E |
| B85 (bit 0) | ○ | ○ | Selection of the feed unit at block connections | – | Instant | M, E |
| B86 | ○ | | Holder angle of angle tool holder | Degree | Instant | M, E |
| B87 | | | | | | |
| B88 | | | | | | |
| B89 | ○ | ○ | Selection of the solid-mode threading tool nose position | – | Instant | M |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B90 to B106 | | | | | | |
| B107 | ○ | | Angle of pre-interpolation corner deceleration | Degree | Instant | M, E |
| B108 | ○ | ○ | Reference axis for polygonal machining | Number of controlled axis | Power OFF → ON | E |
| B109 | ○ | ○ | Spindle number for mill spindle synchronous tapping | Number of controlled axis | Power OFF → ON | M, E |
| B110 | ○ | ○ | Axis control flag for a machine having a high-speed turret | – | Power OFF → ON | M, E |
| B111 | | | | | | |
| B112 | ○ | | S-shaped acceleration/deceleration filtering | – | Instant | M, E |
| B113 to B144 | | | | | | |
| B145 | ○ | ○ | Dwell time during the C-axis unclamping mode in a fixed hole-drilling cycle | msec | Power OFF → ON | M, E |
| B146 | ○ | | Pre-interpolation acceleration/deceleration: Time constant | msec | Instant | M, E |
| B147 | ○ | | Maximum cutting speed for shape correction mode | mm/min or 0.1 inches/min | Instant | M, E |
| B148 | ○ | ○ | Feedrate during measurement for automatic tool offsetting | mm/min | Instant | E |
| B149 | ○ | ○ | Rapid feed overriding data | % | Instant | M, E |
| B150 | ○ | ○ | Rapid feed overriding data | % | Instant | M, E |
| B151 | ○ | ○ | Rapid feed overriding data | % | Instant | M, E |
| B152 | ○ | ○ | Minimum index angle of the FLASH-tool | 0.1 degrees | Instant | M, E |
| B153 | ○ | ○ | Maximum spindle speeds setting for each gear position [1] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B154 | ○ | ○ | Maximum spindle speeds setting for each gear position [2] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B155 | ○ | ○ | Maximum spindle speeds setting for each gear position [3] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B156 | ○ | ○ | Maximum spindle speeds setting for each gear position [4] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B157 | ○ | ○ | Maximum spindle speeds setting for each gear position [5] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B158 | ○ | ○ | Maximum spindle speeds setting for each gear position [6] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B159 | ○ | ○ | Maximum spindle speeds setting for each gear position [7] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B160 | ○ | ○ | Maximum spindle speeds setting for each gear position [8] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B161 | ○ | ○ | Critical spindle speeds setting for each gear position [1] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B162 | ○ | ○ | Critical spindle speeds setting for each gear position [2] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B163 | ○ | ○ | Critical spindle speeds setting for each gear position [3] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B164 | ○ | ○ | Critical spindle speeds setting for each gear position [4] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B165 | ○ | ○ | Critical spindle speeds setting for each gear position [5] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B166 | ○ | ○ | Critical spindle speeds setting for each gear position [6] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B167 | ○ | ○ | Critical spindle speeds setting for each gear position [7] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B168 | ○ | ○ | Critical spindle speeds setting for each gear position [8] during a synchronous tapping cycle | $min^{-1}$ (rpm) | Power OFF → ON | M, E |
| B169 | ○ | ○ | Maximum permissible speed of the rotational axis for polygonal/hobbing machining | $min^{-1}$ (rpm) | Power OFF → ON | E |
| B170 | ○ | ○ | Acceleration/deceleration time constant for synchronous tapping | msec | Power OFF → ON | M, E |
| B171 | ○ | ○ | Spindle 1/4h (1/2h) rated torque for L coils for auto-pecking of the cutting load detection type | 0.1 N·m | Instant | M |
| B172 | ○ | ○ | Spindle 1/4h (1/2h) rated torque for H coils for auto-pecking of the cutting load detection type | 0.1 N·m | Instant | M |
| B173 | ○ | ○ | Cutting force calculation filter for auto-pecking of the cutting load detection type | 7.1 msec | Instant | M |
| B174 I B175 | | | | | | |
| B176 | ○ | | Time constant for threading | msec | Instant | M, E |
| B177 | ○ | | Analog output offset adjustment | – | Instant | M, E |
| B178 | ○ | | Analog output offset adjustment | – | Instant | M, E |
| B179 | ○ | | Analog output offset adjustment | – | Instant | M, E |
| B180 | ○ | | Analog output offset adjustment | – | Instant | M, E |
| B181 | ○ | | Analog output offset adjustment | – | Instant | M, E |
| B182 | ○ | | Analog output gain adjustment | – | Instant | M, E |
| B183 | ○ | | Analog output gain adjustment | – | Instant | M, E |
| B184 | ○ | | Analog output gain adjustment | – | Instant | M, E |
| B185 | ○ | | Analog output gain adjustment | – | Instant | M, E |
| B186 | ○ | | Analog output gain adjustment | – | Instant | M, E |
| B187 | ○ | | Analog input gain adjustment | – | Instant | M, E |
| B188 | ○ | | Analog input gain adjustment | – | Instant | M, E |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B189 | ○ | | Analog input gain adjustment | – | Instant | M, E |
| B190 | ○ | | Analog input gain adjustment | – | Instant | M, E |
| B191 | ○ | | Analog input gain adjustment | – | Instant | M, E |
| B192 I B199 | | | | | | |
| B200 | ○ | | Correction value for tool-setting data auto-setting functions (for ↓ tool) | 0.001 mm or 0.0001 inches | Instant | M |
| B201 | ○ | | Correction value for tool-setting data auto-setting functions (for ↓ tool) | 0.001 mm or 0.0001 inches | Instant | M |
| B202 | ○ | | Correction value for tool-setting data auto-setting functions (for ← tool) | 0.001 mm or 0.0001 inches | Instant | M |
| B203 | ○ | | Correction value for tool-setting data auto-setting functions (for ← tool) | 0.001 mm or 0.0001 inches | Instant | M |
| B204 | ○ | | Turret rotational runout correction value | 0.001 mm or 0.0001 inches | Instant | M, E |
| B205 I B208 | | | | | | |
| B209 | ○ | | Radius of the rear turret (Dual turret specs. only) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B210 | ○ | | Width of the rear turret (Dual turret specs. only) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B211 | ○ | | Rear turret reference position - X-coordinate (Dual turret specs. only) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B212 | ○ | | Rear turret reference position - Z-coordinate (Dual turret specs. only) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B213 | ○ | | Mounting position of the tool holder (Dual turret specs. only, type 1) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B214 | ○ | | X-axial width of the tool holder for the rear turret (Dual turret specs. only, type 1) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B215 | ○ | | Z-axial width of the tool holder for the rear turret (Dual turret specs. only, type 1) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B216 | ○ | | Mounting position of the tool holder (Dual turret specs. only, type 2) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B217 | ○ | | X-axial width of the tool holder for the rear turret (Dual turret specs. only, type 2) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B218 | ○ | | Z-axial width of the tool holder for the rear turret (Dual turret specs. only, type 2) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B219 | ○ | | Mounting position of the tool holder (Dual turret specs. only, type 3) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B220 | ○ | | X-axial width of the tool holder for the rear turret (Dual turret specs. only, type 3) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B221 | ○ | | Z-axial width of the tool holder for the rear turret (Dual turret specs. only, type 3) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B222 | ○ | | Mounting position of the tool holder (Dual turret specs. only, type 4) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B223 | ○ | | X-axial width of the tool holder for the rear turret (Dual turret specs. only, type 4) | 0.001 mm or 0.0001 inches | Instant | M, E |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B224 | ○ | | Z-axial width of the tool holder for the rear turret (Dual turret specs. only, type 4) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B225 I B228 | ○ | | | | | |
| B229 | ○ | ○ | Opposed-turret mirror image Distance between the turrets | 0.001 mm or 0.0001 inches | Instant | E |
| B230 | ○ | ○ | Inclined Y-axis offsetting - Virtual Y-axis | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B231 | ○ | ○ | Inclined Y-axis offsetting - Real X-axis | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B232 | ○ | ○ | Inclined Y-axis offsetting - Real Y-axis | 0.001 mm or 0.0001 inches | Power OFF → ON | M, E |
| B233 | ○ | | Pre-interpolation acceleration/deceleration: Target speed | mm/min or 0.1 inches/min | Instant | M, E |
| B234 | ○ | | Distance from reference workpiece zero point to center of miiling rotation | 0.001 mm or 0.0001 inches | Instant | M |
| B235 | ○ | | Correction value relating to the workpiece measuring sensor diameter for protrusion width measurement | 0.001 mm or 0.0001 inches | Instant | M |
| B236 | ○ | | Correction value relating to the workpiece measuring sensor diameter for groove width measurement | 0.001 mm or 0.0001 inches | Instant | M |
| B237 | ○ | ○ | Measurement area for automatic tool offsetting X-axial direction | 0.001 mm or 0.0001 inches | Instant | E |
| B238 | ○ | ○ | Measurement area for automatic tool offsetting Z-axial direction | 0.001 mm or 0.0001 inches | Instant | E |
| B239 | ○ | ○ | Deceleration area setting for automatic tool offsetting X-axial direction | 0.001 mm or 0.0001 inches | Instant | E |
| B240 | ○ | ○ | Deceleration area setting for automatic tool offsetting Z-axial direction | 0.001 mm or 0.0001 inches | Instant | E |
| B241 | ○ | ○ | EIA chuck barrier: Jaw shape dimension A | 0.001 mm or 0.0001 inches | Instant | E |
| B242 | ○ | ○ | EIA chuck barrier: Jaw shape dimension B | 0.001 mm or 0.0001 inches | Instant | E |
| B243 | ○ | ○ | EIA chuck barrier: Jaw shape dimension C | 0.001 mm or 0.0001 inches | Instant | E |
| B244 | ○ | ○ | EIA chuck barrier: Jaw shape dimension D | 0.001 mm or 0.0001 inches | Instant | E |
| B245 | ○ | ○ | EIA chuck barrier: Jaw shape dimension E | 0.001 mm or 0.0001 inches | Instant | E |
| B246 | ○ | ○ | EIA chuck barrier: Holder mounting position | 0.001 mm or 0.0001 inches | Instant | E |
| B247 | ○ | ○ | EIA chuck barrier: X-axial width of the holder | 0.001 mm or 0.0001 inches | Instant | E |
| B248 | ○ | ○ | EIA chuck barrier: Z-axial width of the holder | 0.001 mm or 0.0001 inches | Instant | E |
| B249 | ○ | ○ | EIA chuck barrier Z-axial tool nose position | 0.001 mm or 0.0001 inches | Instant | E |
| B250 | ○ | ○ | EIA chuck barrier X-axial tool nose position | 0.001 mm or 0.0001 inches | Instant | E |
| B251 | ○ | ○ | EIA chuck barrier: Sub-chuck mounting position | 0.001 mm or 0.0001 inches | Instant | E |
| B252 | ○ | ○ | EIA tail barrier: Tail extruding length | 0.001 mm or 0.0001 inches | Instant | E |

| Address | H1* | H2* | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|---|---|
| B253 | ○ | ○ | EIA tail barrier: Workpiece length | 0.001 mm or 0.0001 inches | Instant | E |
| B254 | ○ | ○ | EIA tail barrier: Distance from the machine origin position to the leading edge position during tail reversing | 0.001 mm or 0.0001 inches | Instant | E |
| B255 | ○ | ○ | Spindle viscous friction coefficient “cms” for auto-pecking of the cutting load detection type | – | Instant | M |
| B256 | ○ | ○ | Spindle coulombic friction coefficient “fms” for auto-pecking of the cutting load detection type | – | Instant | M |
| B257 | ○ | ○ | X-axial tool reference position (For INTEGREX, ↓ turning tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B258 | ○ | ○ | Z-axial tool reference position (For INTEGREX, ↓ turning tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B259 | ○ | | X-axial tool reference position (Only for INTEGREX, ← turning tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B260 | ○ | | Z-axial tool reference position (Only for INTEGREX, ← turning tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B261 | ○ | | X-axial tool reference position (Only for INTEGREX, ↓ milling tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B262 | ○ | | Z-axial tool reference position (Only for INTEGREX, ↓ milling tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B263 | ○ | | X-axial tool reference position (Only for INTEGREX, ← milling tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B264 | ○ | | Z-axial tool reference position (Only for INTEGREX, ← milling tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B265 | ○ | | Number of jaws to be used for displaying solids (No. 1 spindle) | – | Instant | M |
| B266 | ○ | | Number of jaws to be used for displaying solids (No. 2 spindle) | – | Instant | M |
| B267 | ○ | | Jaws offsets for displaying solids (No. 1 spindle) | 0.1 deg | Instant | M |
| B268 | ○ | | Jaws offsets for displaying solids (No. 2 spindle) | 0.1 deg | Instant | M |
| B269 | ○ | | X-axial tool reference position (Only for INTEGREX, → turning tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B270 | ○ | | Z-axial tool reference position (Only for INTEGREX, → turning tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B271 | ○ | | X-axial tool reference position (Only for INTEGREX, → milling tool) | 0.001 mm or 0.0001 inches | Instant | M, E |
| B272 | ○ | | Z-axial tool reference position (Only for INTEGREX, → milling tool) | 0.001 mm or 0.0001 inches | Instant | M, E |

## 2-3 DATA INPUT/OUTPUT PARAMETER

**Note:** M: Valid only for MAZATROL Program
E: Valid only for EIA/ISO Program

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| CMT1 I CMT24 | | | | |
| CMT25 (bit 0) | Selection of loading tool data or tool offset data | | I/O start | M, E |
| CMT25 (bit 1) | Selection of saving program with set up data | | I/O start | M, E |
| CMT25 (bit 2) | Selection of loading tool data number and suffix | | I/O start | M, E |
| CMT25 (bit 3) | Selection of loading pitch error compensation of machining parameter | | I/O start | M, E |
| CMT25 (bit 4) | Selection of loading jaw data | | I/O start | M, E |
| CMT26 I CMT32 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| TAP1 | Terminator type | | I/O start | M, E |
| TAP2 | Terminator code 1 | | I/O start | M, E |
| TAP3 | | | | |
| TAP4 | Use/disuse of CR code output to paper tape punch | | I/O start | M, E |
| TAP5 | Selection of DC code parity | | I/O start | M, E |
| TAP6 | Feed control flag | | I/O start | M, E |
| TAP7 | | | | |
| TAP8 | | | | |
| TAP9 | Perforation pattern for “[“ code for EIA<br>Transmission retry frequency for file transfer | – | I/O start | M, E |
| TAP10 | Perforation pattern for “]“ code for EIA<br>Acceptance retry frequency for file transfer | – | I/O start | M, E |
| TAP11 | Perforation pattern for “#“ code for EIA<br>Transmission retry frequency for command message transfer | – | I/O start | M, E |
| TAP12 | Perforation pattern for “∗“ code for EIA<br>@ waiting time for DNC transfer | – | I/O start | M, E |
| TAP13 | Perforation pattern for “=” code for EIA<br>TEXT, * waiting time for transfer | – | I/O start | M, E |
| TAP14 | Perforation pattern for “:” code for EIA<br>TEXT, * waiting time for transfer | – | I/O start | M, E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| TAP15 I TAP24 | | | | |
| TAP25 | Selection of parity V check | | I/O start | M, E |
| TAP26 (bit 0) | Program name tape input/output valid or invalid | | I/O start | M, E |
| TAP26 (bit 1) | Punching the setup information of PTP program valid or invalid | | I/O start | M, E |
| TAP26 (bit 2) | | | | |
| TAP26 (bit 3) | | | | |
| TAP26 (bit 4) | | | | |
| TAP26 (bit 5) | | | | |
| TAP26 (bit 6) | | | | |
| TAP26 (bit 7) | Selection of whether RTS/CTS control is to be conducted when “PTP DC control” is selected | | I/O start | M, E |
| TAP27 (bit 0) | Selection of PTP program end code - O or : | | I/O start | M, E |
| TAP27 (bit 1) | | | | |
| TAP27 (bit 2) | Selection of PTP program end code - M199 | | I/O start | M, E |
| TAP27 (bit 3) | Selection of PTP program end code - M198 | | I/O start | M, E |
| TAP27 (bit 4) | Selection of PTP program end code - M99 | | I/O start | M, E |
| TAP27 (bit 5) | Selection of PTP program end code - M30 | | I/O start | M, E |
| TAP27 (bit 6) | Selection of PTP program end code - M02 | | I/O start | M, E |
| TAP27 (bit 7) | Character conversion I/O using an extension tape | | I/O start | M, E |
| TAP28 (bit 0) | Protocol B function - start code | | I/O start | E |
| TAP28 (bit 1) | Protocol B function - start DC3 output on completion | | I/O start | E |
| TAP28 (bit 2) | Protocol B function - start DC1 output after NAK or SYN | | I/O start | E |
| TAP28 (bit 3) | Protocol B function - start NC alarm (NAK) output | | I/O start | E |
| TAP28 (bit 4) | Protocol B function - start NC reset (SYN) output | | I/O start | E |
| TAP28 (bit 5) | Protocol B function - start Data code selection | | I/O start | E |
| TAP28 (bit 6) | | | | |
| TAP28 (bit 7) | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| TAP29 | Number of space characters between work No. and data to be punched on paper tape | 1 character | I/O start | M, E |
| TAP30 | Number of space characters between programs to be punched on paper tape | 1 character | I/O start | M, E |
| TAP31 | Number of leading and tailing feed characters of paper tape | 10 character | I/O start | M, E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| DNC1 I DNC8 | | | | |
| DNC9 | Transmission retry frequency for file transfer | Times | I/O start | M, E |
| DNC10 | Acceptance retry frequency for file transfer | Times | I/O start | M, E |
| DNC11 | Transmission retry frequency for command message transfer | Times | I/O start | M, E |
| DNC12 | @ waiting time for transfer | 0.1 sec | I/O start | M, E |
| DNC13 | TEXT, * waiting time for transfer | 0.1 sec | I/O start | M, E |
| DNC14 | EOT waiting time for transfer | 0.1 sec | I/O start | M, E |
| DNC15 | Stop time after acceptance of ! for transfer | 0.1 sec | I/O start | M, E |
| DNC16 | Reset time after digital out for transfer | 0.1 sec | I/O start | M, E |
| DNC17 | Acceptance → transmission switching time for transfer | 0.01 sec | I/O start | M, E |
| DNC18 | Command response message waiting time for transfer | 0.1 sec | I/O start | M, E |
| DNC19 | Machine No. for DNC transfer | | I/O start | M, E |
| DNC20 | | | | |
| DNC21 | Stop time between EOT acceptance and * transmission for transfer | 0.01 sec | I/O start | M, E |
| DNC22 | Stop time between EOT transmission and * transmission for transfer | 0.01 sec | I/O start | M, E |
| DNC23 | | | | |
| DNC24 | | | | |
| DNC25 (bit 0) | Selection of loading tool data or tool offset data | | I/O start | M, E |
| DNC25 (bit 1) | Selection of saving program with set up data | | I/O start | M, E |
| DNC25 (bit 2) | Selection of loading tool data number and suffix | | I/O start | M, E |
| DNC25 (bit 3) | Selection of loading pitch error compensation of machine parameter | | I/O start | M, E |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| DNC25 (bit 4) | Selection of loading jaw data | | I/O start | M, E |
| DNC25 (bit 5) | | | | |
| DNC25 (bit 6) | | | | |
| DNC25 (bit 7) | DNC alarm display selection | | I/O start | M, E |
| DNC26 (bit 0) | Selection of work No. search after program reception | | I/O start | M, E |
| DNC26 (bit 1) | Selection of DNC alarm display | | I/O start | M, E |
| DNC26 (bit 2) | Selection of loading programs of stored work No. | | I/O start | M, E |
| DNC26 (bit 3) | Selection of relieving program rewrite switch function | | I/O start | M, E |
| DNC26 (bit 4) | | | | |
| DNC26 (bit 5) | Selection of outputting data blocks with a data length of 0 | | I/O start | M, E |
| DNC26 (bit 6) | Selection of layout data size | | I/O start | M, E |
| DNC26 (bit 7) | Selection of deleting all programs before work No. 9000 at the program reception start | | I/O start | M, E |
| DNC27 | | | | |
| DNC28 | | | | |
| DNC29 | DNC physical error detection repeat times | Times | I/O start | M, E |
| DNC30 I DNC32 | | | | |

| Address | Outline | Unit | Effective condition | Applicable program (**Note**) |
|---|---|---|---|---|
| DPR1 | Baud rate | | I/O start | M, E |
| DPR2 | Stop bit | | I/O start | M, E |
| DPR3 | Parity bit | | I/O start | M, E |
| DPR4 | Data bit | | I/O start | M, E |
| DPR5 I DPR8 | | | | |
| DPR10 | Method of handshaking | | I/O start | M, E |
| DPR11 | Feed section DC code output | | I/O start | M, E |
| DPR12 | Waiting time | 0.1 sec | I/O start | M, E |
| DPR13 | Output format | | I/O start | M, E |
| DPR14 | Port selection | | I/O start | M, E |
| DPR15 | Number of characters in feed section | 1 character | I/O start | M, E |
| DPR16 | | | | |

- NOTE -

# 3 PARAMETER

Parameters are constants and various data required for setting machine and NC equipment operation modes required for machining.
When machines are delivered, parameters are set at factory. Some of them can be changed by the user.
If wrong values are set as parameter, operation of machines and NC equipment may be hampered. For changing parameters, their meaning and functions must be well understood.
This parameter list shows important parameters for the user. Those which the user hardly need change settings and those not used are omitted from the list. The meaning and functions of parameters are described only important points. If functions of parameters to be changed are not clearly understood, contact our service centers.

## 3-1 How to Use Parameter List

The parameters are listed in a form as shown below.

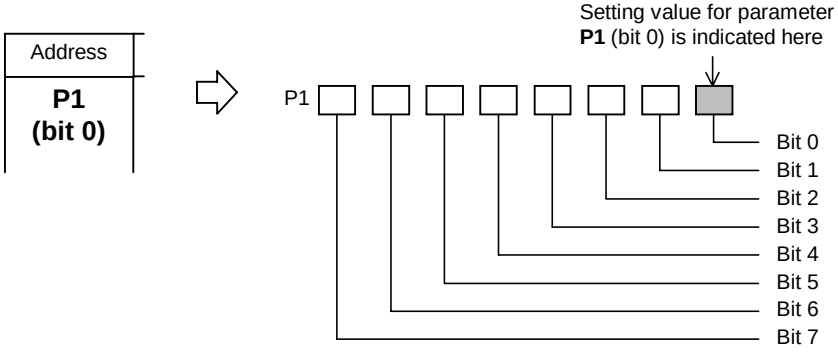
| **Title of display** | (1) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| (2) | (3) | | (7) |
| | Unit | (4) | |
| | Effective condition | (5) | |
| | Applicable program | (6) | |

(1): Title of display showing required parameter

(2): Address (nomenclature) of required parameter
- Bit input type parameters have the bit No. shown in the parentheses below address.

**Example:**




(3): Meaning of required parameter

(4): Setting unit for parameter

(5): Conditions on which set value is effective

**Example 1:** "Instant" designates that new parameter value becomes effective upon parameter change.

**Example 2:** "Power OFF → ON" designates that new parameter value will become effective after procedure below.

[1] Change parameter setting value.
⇩ (By procedure similar to changing of ordinary data)
[2] Press power off button on the operation panel.
⇩
[3] Press power on button on the operation panel.

**Example 3:** In the parameter list, "I/O start" means that the system operates at the parameter data entered before the start of I/O. If the parameter data is modified during I/O operation, the new data will not become valid until the I/O operation has been completed.

(6): Applicable program

M..... Effective only for MAZATROL programs
E ..... Effective for EIA/ISO programs
M, E ..... Effective for MAZATROL programs and EIA/ISO programs

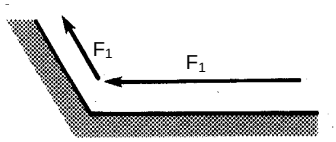
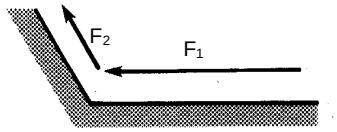
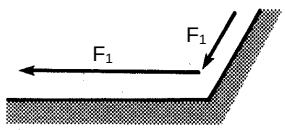
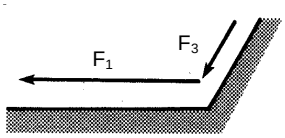
(7): Description of required parameter
Relevant parameters are indicated in the parentheses at bottom.

**Precautions**

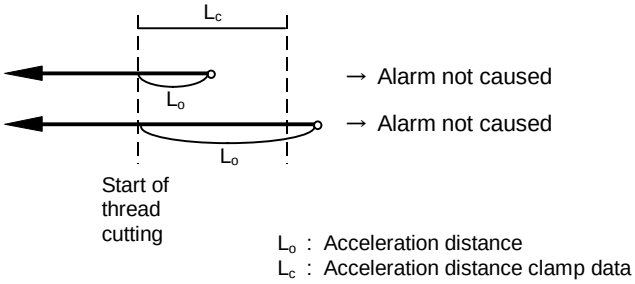
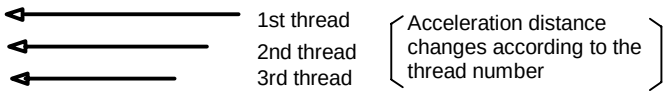
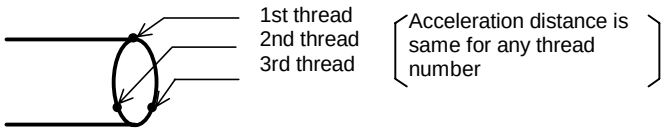
1. The type and setting value for required parameters may vary according to machine types, use/disuse of optional equipment and manufacturing time.
   Values set for specific machines and NC equipment must not be used for other machines and NC equipment.
2. The factory set parameters are recorded on separate paper and stored inside the control cabinet. This paper must not be lost.
3. If parameter setting values are changed, values before and after the change must be recorded for storage.
4. If machines are not operated for a long time, battery backup may be lost and data will be destroyed (battery alarm indicated). In this case, confirm parameter setting values by referring to the parameter record paper. If machines are operated with data lost, error will be caused.

## 3-2 PARAMETER (USER, CUTTING P)

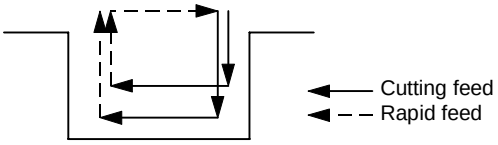
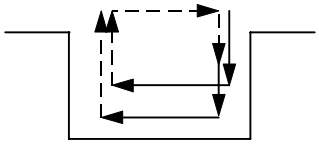
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P1<br>(bit 0)</td><td colspan="2" rowspan="2">Use/disuse of acceleration in up-going slope during rough cutting cycle in bar machining unit (BAR)</td><td>P1 (bit 0) = 0: Disuse<br>  <br><br>No acceleration<br><br>P1 (bit 0) = 1: Use<br>  <br><br>$F_2 > F_1$<br>$F_1$ : Feedrate for rough cutting cycle<br>$F_2$ : Feedrate after acceleration<br><br>NM211-00208</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td><td rowspan="2">(⇨K2, K3)</td></tr>
<tr><td>Applicable programm</td><td>M</td></tr>
<tr><td rowspan="4">P1<br>(bit 1)</td><td colspan="2" rowspan="2">Use/disuse of deceleration in down-going slope during rough cutting cycle in bar machining unit (BAR)</td><td>P1 (bit 1) = 0: Disuse<br>  <br><br>No deceleration<br><br>P1 (bit 1) = 1: Use<br>  <br><br>$F_3 < F_1$<br>$F_1$ : Feedrate for rough cutting cycle<br>$F_3$ : Feedrate after deceleration<br><br>NM211-00209</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td><td rowspan="2">(⇨K4, K5)</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P1<br>(bit 3)</td><td colspan="2" rowspan="1">Selection between use/disuse of acceleration distance check at start of thread cutting unit (THR)</td><td rowspan="4">P1 (bit 3) = 0: Disuse<br>Alarm not caused even if acceleration distance at start of thread cutting unit exceeds clamp data<br><br>P1 (bit 3) = 1: Use<br>Alarm caused when acceleration distance at start of thread cutting unit exceeds clamp data<br><br>Example:<br>  <br><br>Lo : Acceleration distance<br>Lc : Acceleration distance clamp data<br><br>(⇨U38)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Aapplicable program</td><td>M</td></tr>
<tr><td rowspan="4">P1<br>(bit 4)</td><td colspan="2" rowspan="1">Selection between start position shift/start angle shift for thread number offset in thread cutting unit (THR)</td><td rowspan="4">P1 (bit 4) = 0: Start position shift<br>Thread number offset adjusted by moving thread cutting start position<br><br>  <br><br><br>P1 (bit 4) = 1: Start angle shift<br>Thread number offset adjusted according to thread cutting start angle<br><br>  <br></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P1 (bit 5)** | Selection between whether or not tool should be returned to tool change position on M code unit (M) end | | **P1** (bit 5) = 0: Not return<br>Tool not moved from the end of the previous unit after completing M code unit (M)<br>**P1** (bit 5) = 1: Return<br>Tool returned to tool change position after completing M code unit (M)<br>(⇨**P17**) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P1 (bit 6)** | Selecting whether the spindle is to be stopped following completion of the END unit in which continuous machining is specified | | **P1** (bit 6) = 0: The spindle stops.<br>**P1** (bit 6) = 1: The spindle does not stop. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P1 (bit 7)** | Selection between whether or not tool should be returned to tool change position at program end for cycles except for final repetition of same program | | Tool will be moved to the following position after executing 1 to (N-1)th cycles if the program repetition frequency is represented by N (N ≥ 2).<br>**P1** (bit 7) = 0: Return<br>Tool always returned to tool change position for any location specified for program end unit (END)<br>**P1** (bit 7) = 1: Not return<br>Tool always returned to position specified for program end unit (END) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P2 (bit 0)** | Selection for cutting path method in milling line machining unit (MGV, LCT, RGT, LFT) | | **P2** (bit 0) = 0<br>  <br><br>**P2** (bit 0) = 1: High speed mode<br>  |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P2 (bit 1)** | Output/no output of spindle rotation command during manual program machining unit (MNP) | | **P2** (bit 1) = 0: Output<br>Output of M3, M4 or M5 according to tools assigned to manual program machining unit (MNP)<br>**P2** (bit 1) = 1: No output<br>No output of spindle rotation command during manual program machining unit (MNP). Specify **M3**, **M4** or **M5**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P2 (bit 2)** | Selection of whether the return to the tool change position is to be executed upon issuance of T-command with the same TNo. but followed different suffix. | | **P2** (bit 2) = 0<br>The tool change position is not reached.<br>**P2** (bit 2) = 1<br>The tool change position is reached.<br>This parameter is effective only for tools with suffix H or V of the V/H turret specifications. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P2 (bit 4)** | Selection of whether the position of fixed point is to be shifted by an amount of **A13** | | **P2** (bit 4) = 0<br>**A13** is not added<br>**P2** (bit 4) = 1<br>**A13** is added. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P2 (bit 5)** | Selection of whether the position of the fixed point is to be shifted in the direction of the B-axis by an amount of parameter **A13** | | Select whether the position of fixed point is to be shifted in the direction of the B-axis by an amount of machine parameter **A13** (Amount of shifting of the B-axis movement origin from machine home position reference).<br>**P2** (bit 5) = 0<br>Then the position of the fixed point is shifted without machine parameter **A13** being added.<br>**P2** (bit 5) = 1<br>Then the position of the fixed point is shifted by an amount of machine parameter **A13** |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P2<br>(bit 6)<br>(bit 7)</td><td colspan="2">Selecting an angle margin for nose shape compensation</td><td rowspan="4">An angle margin for nose shape compensation can be selected by setting data in bits 6 and 7.<br><br><table><tr><th colspan="2">Setting</th><th rowspan="2">Angle margin for nose shape compensation</th></tr><tr><th>Bit 7</th><th>Bit 6</th></tr><tr><td>0</td><td>0</td><td>3.0</td></tr><tr><td>0</td><td>1</td><td>2.0</td></tr><tr><td>1</td><td>0</td><td>1.0</td></tr><tr><td>1</td><td>1</td><td>0.5</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">P3<br>(bit 0)</td><td colspan="2">Use/disuse of Z offset check</td><td rowspan="4">P3 (bit 0) = 0: Disuse<br>Even when Z offset of a program to be executed is not set, the machine can be started.<br><br>P3 (bit 0) = 1: Use<br>When Z offset of a program to be executed is not set, the machine cannot be started. (Pressing the start button gives an alarm.)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">P3<br>(bit 1)</td><td colspan="2">Axis designation for TPS operation</td><td rowspan="4">P3 (bit 1) = 0<br>The X-, Z- and C-axes are designated for the position storage during TPS operation.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">P3<br>(bit 2)</td><td colspan="2">Selecion of whether the return to the tool change position is to be executed upon issurance of T-command with the same TNo. but followed by a different suffix.</td><td rowspan="4">P3 (bit 2) = 0<br>The tool change position is reached.<br>However, if the tool set values and nose R of the previous tool and those of the command tool are same, the tool change position is not reached.<br><br>P3 (bit 2) = 1<br>The tool change position is not reached.<br>Pay careful attention to the possible interference, if the tool set values of the previous tool and those of the command tool differ from each other. (except H/V turret type machine)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P3 (bit 3)** | Selection of whether the Y-axial return to zero point is to be executed at the start of MAZATROL programe | | At the start of MAZATROL program:<br>**P3** (bit 3) = 1<br>Return to Y-axis zero point<br><br>**P3** (bit 3) = 0<br>No return to Y-axis zero point<br><br>**Note:**<br>Only valid when the optional Y-axis control is available. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P3 (bit 4)** | Selection of the method for approach/escape during mill-line centr machining | | **P3** (bit 4) = 0 (M PLUS method)<br>Approach to a position of “start point in program + tool radius + clearance **U10**” and escape from a position of “end point in program + tool radius + clearance **U10**”.<br>Approach point is automatically established.<br>If an approach point is designated, routing via that point is realized.<br><br>**P3** (bit 4) = 1 (T PLUS method)<br>Approach to the start point in program and escape from the end point in program.<br>Approach point is not automatically established. Even if an approach point is designated, it will be ignored. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P3 (bit 5)** | Data auto-setting method selection for TAP/MTP (pipe tapping) | | **P3** (bit 5) = 0: Conventional method<br>**P3** (bit 5) = 1: Text file registration data reference method<br>Data that has been registered in the required text file is used for auto-setting of the lathe-turning tap unit (TAP) or milling tap unit (MTP) in **PROGRAM** display for MAZATROL programs. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P3 (bit 7)** | Selection of G1 or G0 as the axial relief feed mode for linear machining | | Select G0 or G1 as the axial relief feed mode for linear machining under the following conditions:<br>- In the case of the tool name scheme, when G1 is selected using the AFD item of the tool sequence of the linear machining unit (ZY, /Y, XT mode)<br>- In the case of the tool number scheme, when parameter **K41** is not 0<br><br>**P3** (bit 7) = 0<br>The axial relief feed mode becomes equal to G1.<br><br>**P3** (bit 7) = 1<br>The axial relief feed mode becomes equal to G0. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P4 (bit 1)** | Selection of display type of tapping tool in solide mode | | In the solide mode of TOOL PATH display:<br>**P4** (bit 1) = 0<br>Simplified display of tapping tool<br>**P4** (bit 1) = 1<br>Detailed display of tapping tool |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P5 (bit 3)** | Spindle synchronizing pattern | | During spindle-to-spindle rotational transfer in the TRS unit:<br>**P5** (bit 3) = 0:<br>The spindles do not synchronize.<br>**P5** (bit 3) = 1:<br>The spindles synchronize. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P6 (bit 0)** | Selection of whether immediate indexing of the automatically selected spare tool is to be made valid or invalid. | | **P6** (bit 0) = 0: Invalid<br>After tool change, the new tool is immediately selected and used.<br>**P6** (bit 0) = 1: Valid<br>After tool change, the new tool is selected last in the same tool group. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | (⇨**P16** Bit 3) |
| **P6 (bit 1)** | Selection of the order of spare tool selection - TNo. order or Equal life order | | **P6** (bit 1) = 0: TNo. order<br>Tools are selected in normal ascending order of the tool number within the same tool group.<br>**P6** (bit 1) = 1: Equal life order<br>Tools are selected in the order of residual tool life, that is magnitude of the data obtained by subtracting the cumulative operation time of each tool (or the number of machined workpieces for each tool) from the initial design lives of the tools (or the estimated number of machinable workpieces). |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | (⇨**P16** Bit 3) |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P6 (bit 2)** | Tool offset type selection - Type A or type B | | **P6** (bit 2) = 0<br>Tool offset type with 1 offset category (type A) is selected.<br><br>**P6** (bit 2) = 1<br>Tool offset type with GEOMETRIC OFFSET + WEAR COMP. (type B) is selected. |
| | Unit | — | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **P6 (bit 4)** | Counting all types of use under the same tool number for the tool life management on the TOOL DATA display executed/not executed | | **P6** (bit 4) = 0<br>Counting each type of use under the same tool number individually.<br><br>**P6** (bit 4) = 1<br>Counting all types of use under the same tool number integratingly.<br><br>For EIA programs, this parameter is only valid when **P16** bit 3 = 0. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P6 (bit 5)** | Name/ID No. selection on the TOOL DATA display | | **P6** (bit 5) = 0<br>A name can be selected.<br>**P6** (bit 5) = 1<br>An ID number can be selected. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P6 (bit 7)** | VISUAL TOOL MANAGER display valid/invalid | | **P6** (bit 7) = 0: VISUAL TOOL MANAGER display invalid.<br>**P6** (bit 7) = 1: VISUAL TOOL MANAGER display valid.<br>This display is only made with M640MT. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P7 (bit 1)** | Selection of a shape-drawing position for milling (Inverted vertical spindle lathe tool plate specifications) | | Select whether the shape-drawing position for milling is to be shifted through 180 deg (opposed side).<br>**P7** (bit 1) = 0: As before<br>**P7** (bit 1) = 1: The milling shape is drawn at the opposite side.<br>(This parameter is valid only for tool plate specifications (opposed-turret specifications).) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P7 (bit 2)** | Input digit quantity selection of infeed point coordinate | | The following values of digits can be set for items CPT-X and CPT-Z of bar cutting unit (BAR) and copy machining unit (CPY).<br>**P7** (bit 2) = 0<br>For millimeter specification: One decimal digit<br>CPT-X ..... 0.1 to 9999.9<br>CPT-Z..... –9999.9 to 9999.9<br>For inch specification: Two decimal digits<br>CPT-X ..... 0.01 to 999.99<br>CPT-Z..... –999.99 to 999.99<br>**P7** (bit 2) = 1<br>For millimeter specification: Two decimal digits<br>CPT-X ..... 0.01 to 999.99<br>CPT-Z..... –999.99 to 999.99<br>For inch specification: Three decimal digits<br>CPT-X ..... 0.001 to 99.999<br>CPT-Z..... –99.999 to 99.999 |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | Description |
|---|---|---|
| **P7 (bit 3)** | Selection of conditions capable of setting tool data | **P7** (bit 3) = 0<br>Tool data can always be set on all items of TOOL DATA display (Compensation display) and the item “DIAMETER/NOSE-R” of TOOL DATA display (Shape information display).<br>**P7** (bit 3) = 1<br>○: Data setting possible<br>×: Data setting impossible |

| Machine status | Setting of reprogramming switch | TOOL DATA display (Compensation display) | | | | | |
|---|---|---|---|---|---|---|---|
| | | TOOL SET | WEAR COMP. | MAX WEAR | LIFE | USED | TL EYE COMP. |
| During automatic operation | LOCK | × | ○ | × | × | × | × |
| | ENABLE | × | ○ | × | × | × | × |
| In automatic mode (program execution not in progress) | LOCK | × | ○ | × | × | ○ | × |
| | ENABLE | × | ○ | ○ | ○ | ○ | ○ |
| During manual operation | LOCK | × | ○ | × | × | ○ | × |
| | ENABLE | ○ | ○ | ○ | ○ | ○ | ○ |

| Machine status | Setting of reprogramming switch | TOOL DATA display (Shape information display) | |
|---|---|---|---|
| | | DIAMETER/NOSE-RA.-R | Other items |
| During automatic operation | LOCK | ○ | × |
| | ENABLE | ○ | × |
| In automatic mode (program execution not in progress) | LOCK | ○ | × |
| | ENABLE | ○ | ○ |
| During manual operation | LOCK | ○ | × |
| | ENABLE | ○ | ○ |

| | |
|---|---|
| Unit | — |
| Effective condition | Instant |
| Applicable program | M, E |

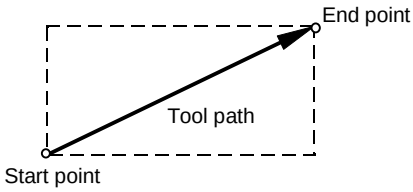
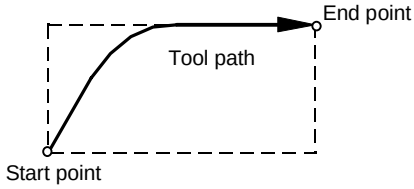
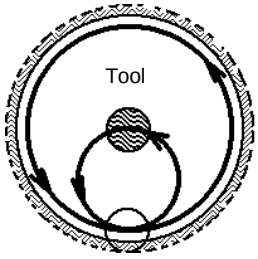
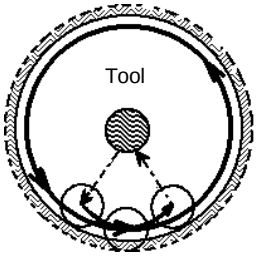
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P7 (bit 4)** | JAW SHAPE display name/code selection | | **P7** (bit 4) = 0<br>A name can be selected.<br>**P7** (bit 4) = 1<br>A code can be selected. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P8 (bit 3)** | Tool nose position storage function valid/invalid on the TOOL OFFSET display | | Select whether the tool nose position storage function is to be made valid or invalid on the TOOL OFFSET display.<br>**P8** (bit 3) = 0 : Invalid<br>**P8** (bit 3) = 1: Valid |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P8 (bit 7)** | Selection of use/disuse of tool identification code skip function | | **P8** (bit 7) = 0 : Disuse<br>Cursor allowed to be positioned at item for tool identification code setting<br>**P8** (bit 7) = 1: Use<br>Cursor moved by skipping items for tool identification setting |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P9 (bit 0)** | Command data execution as it is/at 10 times | | **P9** (bit 0) = 0<br>Command data without a decimal point is executed as it is.<br>**P9** (bit 0) = 1<br>Command data without a decimal point is executed at 10 times.<br>Both functions are valid only for coordinate data setting. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

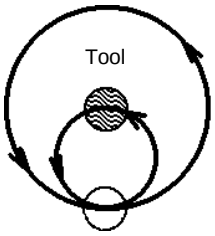
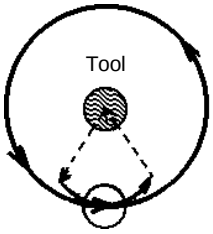
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P9<br>(bit 2)</td><td colspan="2">Selection of G-code series A</td><td rowspan="8">P9 (bit 2) = 0<br>G code in series A selected.<br><br>P9 (bit 2) = 1<br>G code in series B selected.<br>If both bits 2 and 3 of P9 are set to 0, then the G-codes of series B become valid.<br><br>If both bits 2 and 3 of P9 are set to 1, then the G-codes of series C become valid.<br><br><table><tr><th colspan="2">Setting</th><th rowspan="2">G-code series</th></tr><tr><th>Bit 3</th><th>Bit 2</th></tr><tr><td>0</td><td>0</td><td>B</td></tr><tr><td>0</td><td>1</td><td>A</td></tr><tr><td>1</td><td>0</td><td>B</td></tr><tr><td>1</td><td>1</td><td>C</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P9<br>(bit 3)</td><td colspan="2">Selection of G-code series B</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P9<br>(bit 5)</td><td colspan="2">Selection of the command type without decimal point</td><td>P9 (bit 5) = 0: Not select<br>Position command data without decimal point united by specified minimum input unit (0.01, 0.001, 0.0001 mm or inches)<br><br>P9 (bit 5) = 1: Select<br>Position command data without decimal point processed by 1mm or inch</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P9<br>(bit 6)</td><td colspan="2" rowspan="2">Selection of rapid traverse (G00) interpolation method between interpolation/ independent axis</td><td rowspan="4">P9 (bit 6) = 0: Interpolation<br>  <br><br>Traverse from start point to end point by shortest passage below maximum rapid feedrate of each axis<br><br>P9 (bit 6) = 1: Independent axis<br>  <br><br>Traverse from start point to end point at rapid traverse speed for each axis<br><br>Note:<br>Required time for traverse from start point to end point is the same for both methods.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P9<br>(bit 7)</td><td colspan="2" rowspan="2">Address E specification for thread number/ lead in precision thread cutting command (G32)</td><td rowspan="4">P9 (bit 7) = 0<br>Thread number specified per inch for address E in thread cutting command<br><br>P9 (bit 7) = 1<br>Precision lead for address E in thread cutting command</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P10<br>(bit 0)</td><td colspan="2" rowspan="2">Selection of whether short-cutting is to be executed during circular milling (CIR)</td><td rowspan="4">During circular milling pattern B:<br>P10 (bit 0) = 0<br>Short-cutting is not executed.<br>  <br><br>P10 (bit 0) = 1<br>Short-cutting is executed.<br>  <br></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P10 (bit 1)** | Selection of whether short-cutting is to be executed during chamfering | | During chamfering:<br>**P10** (bit 1) = 0<br>Short-cutting is not executed.<br>  <br>**P10** (bit 1) = 1<br>Short-cutting is executed.<br>  |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P10 (bit 2)** | Selection of whether or not dwell command (G04) should be specified in time. | | **P10** (bit 2) = 0: No time<br>Time specified in asynchronous feed mode (G98), and rotation number specified in synchronous feed mode (G99)<br>**P10** (bit 2) = 1: Time<br>Time specified in asynchronous feed mode (G98) as well as in synchronous feed mode (G99) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P10 (bit 3)** | Tool compensation amount selection for EIA/ISO programs | | During selection of MAZATROL coordinate systems in the EIA/ISO program, the wear compensation amount and TOOL EYE compensation amount in TOOL DATA display are:<br>**P10** (bit 3) = 0: Not added<br>**P10** (bit 3) = 1: Added<br>**Example:** G53<br>T 0 1 0 1<br>"WEAR COMP." and<br>"TL EYE COMP." are added.<br>**Note:**<br>Refer to "Tool offset functions" of the EIA/ISO Programming Manual for further details. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P10 (bit 4)** | Selection of T command digit length | | **P10** (bit 4) = 0<br>Specify the T command by a number of 4 digits.<br>T 0 1 0 1<br>Tool offset number<br>Tool number<br>**P10** (bit 4) = 1<br>Specify the T command by a number of 6 digits.<br>T 0 0 1 0 0 1<br>Tool offset number<br>Tool number |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P10 (bit 5)** | Use/disuse of interruption prevention function | | **P10** (bit 5) = 0: Disuse<br>Alarm caused if cutting into workpiece is recognized in interruption check during nose R compensation, and relevant block not executed<br>**P10** (bit 5) = 1: Use<br>Tool path automatically changed when cutting into workpiece is recognized in interruption check during nose R compensation |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P10 (bit 6)** | Selection between return to referential point/by escape distance in deep hole drilling cycle (G83/G87) | | **P10** (bit 6) = 0<br>Tool tip returned to R point after completing steps of deep drilling cycle, and next step executed<br>**P10** (bit 6) = 1<br>Tool tip returned by escape distance (**U45**) after completing steps of deep drilling cycle, and next step executed |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | (⇨**U45**) |
| **P10 (bit 7)** | Selection between initial point/referential point for tool return position at the end of drilling cycle (G80s) | | **P10** (bit 7) = 0<br>Tool tip returned to initial point upon end of drilling cycle<br>**P10** (bit 7) = 1<br>Tool tip returned to R point upon end of drilling cycle |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P11 (bit 0)** | Selection of initial G96 (allowed only in G code series A) | | **P11** (bit 0) = 0: Not select<br>Peripheral speed constant control cancel mode automatically selected upon power on<br>**P11** (bit 0) = 1: Select<br>Peripheral speed constant control mode automatically selected upon power on |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P11 (bit 1)** | Selection of initial G99 (allowed only in G code series A) | | **P11** (bit 1) = 0 : Not select<br>Asynchronous feed mode automatically selected upon power on<br>**P11** (bit 1) = 1 : Select<br>Synchronous feed mode automatically selected upon power on |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P11 (bit 2)** | Selection of initial G90 (allowed only in G code series B and C) | | **P11** (bit 2) = 0 : Not select<br>Incremental programming (G91) automatically selected upon power on<br>**P11** (bit 2) = 1 : Select<br>Absolute programming (G90) automatically selected upon power on |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P11 (bit 4)** | Use/disuse of high speed processing function during machine lock | | **P11** (bit 4) = 0: Disuse<br>Processing by time at feedrate specified in program even if program is executed by selecting machine lock function<br>**P11** (bit 4) = 1: Use<br>Feedrate entirely changed to rapid traverse speed when program is executed by selecting machine lock function, and dwell time (G04) ignored |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P11 (bit 5)** | Selection between whether or not intermediate point should be ignored during execution of reference return command (G28/G30) | | **P11** (bit 5) = 0: Not ignored<br>Tool tip returned to reference point by passing intermediate point specified in program<br>**P11** (bit 5) = 1: Ignored<br>Tool tip returned to reference point by ignoring intermediate point specified in program |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P11 (bit 6)** | Selection of whether the machine is to be brought to a macro single-block stop | | **P11** (bit 6) = 0<br>The machine does not stop for each macro block during single-block operation.<br>**P11** (bit 6) = 1<br>The machine stops for each macro block during single-block operation. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P11 (bit 7)** | Absolute/incremental axis name selection | | **P11** (bit 7) = 0<br>Selection of absolute/incremental programming by G code<br>**P11** (bit 7) = 1<br>Selection of absolute/incremental programming by address<br>X, Z, Y, C ..... absolute programming<br>U, W, V, H ..... incremental programming |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P12 (bit 0)** | Selection of positioning method during fixed cycle | | **P12** (bit 0) = 0: G00<br>Traverse by G00 to drilling position during fixed cycle mode<br>**P12** (bit 0) = 1: Modal<br>Traverse by selected modal G code (G00 or G01) to drilling position during fixed cycle mode |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P12 (bit 1)** | Selection of whether or not G50 is used during G53 mode | | **P12** (bit 1) = 0: Disuse<br>G50 command not used during G53 mode<br>**P12** (bit 1) = 1: Use<br>G50 command used during G53 mode |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P12 (bit 2)** | Selection of initial G53 | | **P12** (bit 2) = 0: Not select<br>G50 coordinate system selected initially<br>**P12** (bit 2) = 1: Select<br>MAZATROL coordinate system selected initially |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P12 (bit 3)** | Selection of initial G00 | | **P12** (bit 3) = 0: Not select<br>G01 mode automatically selected upon power on<br>**P12** (bit 3) = 1: Select<br>G00 mode automatically selected upon power on |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P12 (bit 5)** | M3 (M203)/M4 (M204) (spindle rotation command) selection - output at hole bottom during tapping cycle | | **P12** (bit 5) = 0<br>Output of M4 or M204 at hole bottom during tapping cycle (G84/G88) (for right-handed thread)<br>**P12** (bit 5) = 1<br>Output of M3 or M203 at hole bottom during tapping cycle (G84/G88) (for left-handed thread) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P12 (bit 6)** | Selection of the operation occurring during the control of the tool tip point when command G49 is issued (when the tool length offset value is canceled) | | Select the type of operation occurring during the control of the tool tip point when command G49 is issued (when the tool length offset value is canceled).<br>**P12** (bit 6) = 0<br>The axis moves according to the tool length offset value.<br>**P12** (bit 6) = 1<br>The axis does not move. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

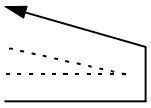
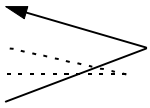
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P12 (bit 7)** | Selection of coordinate system type for controlling the tool tip point | | Select the coordinate system type for controlling the tool tip point.<br>**P12** (bit 7) = 0<br>The table coordinate system that rotates according to the particular rotation of the C-axis is defined as the programming coordinate system.<br>**P12** (bit 7) = 1<br>The work coordinate system is defined as the programming coordinate system. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P13 (bit 0)** | Use/disuse of compensation movement during T command | | **P13** (bit 0) = 0: Disuse<br>Compensation movement not made on T command<br>**P13** (bit 0) = 1: Use<br>Compensation movement made on T command |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P13 (bit 1)** | Use/disuse of block stop after restart | | **P13** (bit 1) = 0<br>Block stop not used after restart<br>**P13** (bit 1) = 1<br>Block stop used after restart |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P13 (bit 2)** | Use/disuse of automatic return on resuming program | | **P13** (bit 2) = 0: Disuse<br>Not returned to program start upon program end<br>**P13** (bit 2) = 1: Use<br>Program head automatically called upon program end |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P13 (bit 3)** | Use/disuse of G00 dry run | | **P13** (bit 3) = 0: Disuse<br>Rapid traverse speed not changed to dry run speed<br>**P13** (bit 3) = 1: Use<br>Rapid traverse speed changed to manually adjusted dry run speed |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P13 (bit 4)** | Use/disuse of dry run during thread cutting | | **P13** (bit 4) = 0:<br>Disuse of dry run during thread cutting cycle<br>**P13** (bit 4) = 1:<br>Use of dry run during thread cutting cycle |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P13 (bit 5)** | Use/disuse of feed hold during thread cutting | | **P13** (bit 5) = 0<br>Disuse of feed hold during thread cutting cycle<br>**P13** (bit 5) = 1<br>Use of feed hold during thread cutting cycle |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P13 (bit 7)** | Use/disuse of reverse rotation error prevention function during G46 mode | | **P13** (bit 7) = 0: Disuse<br>Alarm caused if nose R compensation direction is reversed during G46 mode.<br>**P13** (bit 7) = 1: Use<br>Alarm not caused even if nose R compensation direction is reversed during G46 mode. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P14<br>(bit 4)</td><td colspan="2" rowspan="2">Whether the workpiece barriers are to be activated</td><td rowspan="4">P14 (bit 4) = 0<br>The workpiece barriers do not function.<br><br>P14 (bit 4) = 1<br>The workpiece barriers function.<br><br>This parameter is valid only for a MULTIPLEX.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">P14<br>(bit 5)</td><td colspan="2" rowspan="2">Nose R compensation change-over</td><td rowspan="4">P14 (bit 5) = 0: T32 interchangeable mode<br>P14 (bit 5) = 1: Standard mode<br><br>
<table>
<tr><th>Parameter setting / Operational difference</th><th>0</th><th>1</th></tr>
<tr><td>Single-block stopping position of inserted block</td><td>Succeeding the inserted block</td><td>Preceding the inserted block</td></tr>
<tr><td>Opposed-turret mirror image (in G68/G69 mode)</td><td>Direction of compensation chages</td><td>Nose R compensation is temporarily cancelled</td></tr>
<tr><td>Straight lines with an intersection angle of 1 deg. or less</td><td>  <br>Solid line: Tool path</td><td>  <br>Solid line: Tool path</td></tr>
</table>
</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P14<br>(bit 6)</td><td colspan="2" rowspan="2">Selection as to handling of leading zeros in the DPRNT command mode</td><td rowspan="4">P14 (bit 6) = 0<br>Leading zeros are omitted.<br><br>P14 (bit 6) = 1<br>Leading zeros are replaced with spaces.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

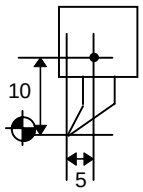
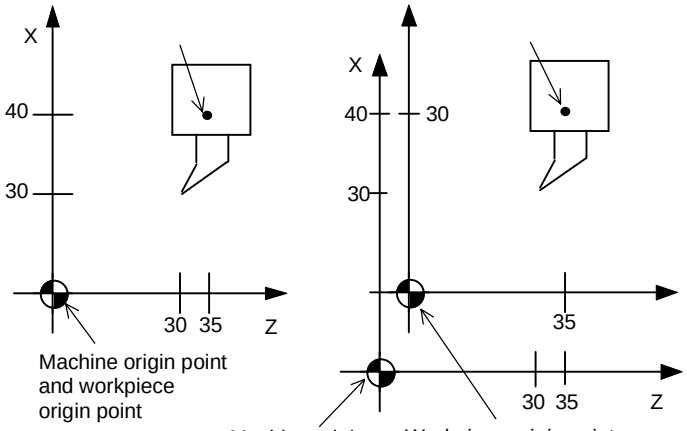
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P14<br>(bit 7)</td><td colspan="2">Selecting a method of updating data during automatic nose measurement (for EIA)</td><td rowspan="4">P14 (bit 7) = 0: Incremental method<br>1. Normal tool (without reference tool) ・・ B14 = 0<br>Addition New offset value X or Z = Former offset value X or Z + Compensation value X or Z<br>Subtraction New offset value X or Z = Former offset value X or Z – Compensation value X or Z<br>2. Reference tool..... B14 = Value of address P<br>Addition New offset value X or Z = Former offset value X or Z + Compensation value X or Z<br>Subtraction New offset value X or Z = Former offset value X or Z – Compensation value X or Z<br>3. Normal tool (with reference tool)<br>B14 ≠ value of address P, B14 ≠ 0<br>Addition New offset value X or Z = Former offset value X or Z + (Compensation value X or Z – Reference tool offset value X or Z)<br>Subtraction New offset value X or Z = Former offset value X or Z – (Compensation value X or Z – Reference tool offset value X or Z)<br><br>P14 (bit 7) = 1: Absolute method<br>1. Normal tool (without reference tool) ・・ B14 = 0<br>New offset value X or Z = Compensation value X or Z<br>2. Reference tool..... B14 = Value of address P<br>New offset value X or Z = Compensation value X or Z<br>1. Normal tool (with reference tool)<br>B14 ≠ value of address P and B14 ≠ 0<br>New offset value X or Z = Compensation value X or Z – Reference tool offset value X or Z</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P15<br>(bit 0)</td><td colspan="2">Overriding valid/invalid of the return speed during a synchronous tapping (parameter K70)</td><td rowspan="4">P15 (bit 0) = 0<br>Return speed overriding becomes valid.<br><br>P15 (bit 0) = 1<br>Return speed overriding becomes invalid.<br><br>(⇨J22)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P15<br>(bit 1)</td><td colspan="2">Simplified wear offsetting valid/invalid</td><td rowspan="4">P15 (bit 1) = 0 : (invalid)<br>Time, quantity, and wear offset data become the basis for offsetting<br><br>P15 (bit 1) = 1 : (valid)<br>Simplified wear offsetting is used.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

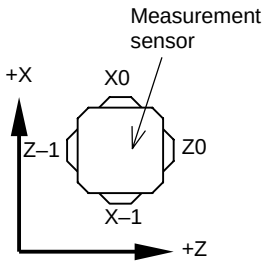
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P15<br>(bit 2)</td><td colspan="2">Method of entering tool position offset data in X-axis direction - Entry in diameter/radius</td><td rowspan="4">P15 (bit 2) = 0<br>The amount of offsetting can be entered in diameter.<br><br>P15 (bit 2) = 1<br>The amount of offsetting can be entered in radius.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P15<br>(bit 3)</td><td colspan="2">Selection of the minimum data unit for secondary auxiliary functions.</td><td rowspan="4">P15 (bit 3) = 0:<br>0.001<br><br>P15 (bit 3) = 1<br>Same as the entered unit 0.001 if metric, or 0.0001 if inch<br><br>Example:<br>B1 command<br><table><tr><td rowspan="2"></td><td colspan="2">Setting</td></tr><tr><td>0</td><td>1</td></tr><tr><td rowspan="2">Output</td><td>Metric</td><td>1000</td><td>1000</td></tr><tr><td>Inch</td><td>1000</td><td>10000</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P15<br>(bit 4)</td><td colspan="2">Address selection for direct input of chamfered corner R curved surface dimensions</td><td rowspan="4">P15 (bit 4) = 0<br>(I), (K), (R), (,R), (,C) and (,A) can be used.<br><br>P15 (bit 4) = 1<br>(R), (C) and (A) can be used.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P15<br>(bit 5)</td><td colspan="2">Selection of whether tool shape offsetting is to be cancelled with offset number 0.</td><td rowspan="4">P15 (bit 5 ) = 0<br>Tool shape offsetting is not cancelled with offset number 0.<br><br>P15 (bit 5) = 1<br>Tool shape offsetting is cancelled with offset number 0.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P15<br>(bit 6)</td><td colspan="2" rowspan="4">Selection of a tool shape offsetting method</td><td rowspan="4">P15 (bit 6) = 0<br>Tool shape offsetting is accomplished by shifting the coordinate system. (The current position is displayed in strict accordance with the program-designated data.)<br>P15 (bit 6) = 1<br>Tool shape offsetting is accomplished by moving the tool.<br>(The current position of the data having the tool compensation amount added to the program-designated data is displayed.)<br><Program example> <Offset No.1><br>N1 T0101 X = 10 Z = 5<br>N2 G1X30.Z30.<br>Program reference<br>  <br><br><u>P15</u> (bit 6) = 1<br>At the end of N2<br>Current position (X, Z)=(40, 35)<br>Machine postion (X, Z)=(40, 35)<br><u>P15</u> (bit 6) = 0<br>At the end of N2<br>Current position (X, Z)=(30, 30)<br>Machine postion (X, Z)=(40, 35)<br>  <br></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P16<br>(bit 0)</td><td colspan="2" rowspan="4">Use/disuse of in-position check</td><td rowspan="4">P16 (bit 0) = 0<br>In-position check not executed<br>P16 (bit 0) = 1<br>In-position check executed<br>Note:<br>Refer to M51 and M52 of M Code List.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

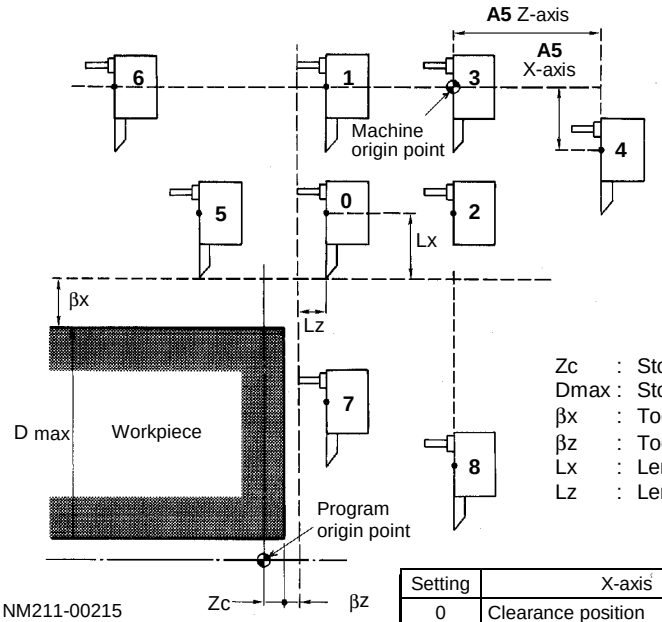
| Address | Meaning | | Description |
|---|---|---|---|
| **P16 (bit 1)** | Automatic setting of target data for nose measurement | | **P16** (bit 1) = 0<br>No target data is automatically calculated during nose measurement [G36 Q2 (nose contact measurement mode)]. Target data must therefore be manually calculated using the following expressions:<br>Target data X ..... Tool-set data X+**B63** (−**B61** × 2)<br>Target data Z ..... Tool-set data Z+**B64**−**A**8_Z (−**B62**)<br>Data in parentheses above is required for an inside diameter tool.<br>**P16** (bit 1) = 1<br>Target data is automatically calculated during nose measurement [G36 Q2 (nose contact measurement mode)].<br>Outside diameter tool ..... `X0` `Z0`<br>Inside diameter tool ..... `X-1` `Z-1`<br>  <br>Notation formats<br>Outside diameter tool:..... `G36X0Z0K_P/T_Q2R_;`<br>Inside diameter tool:..... `G36X−1Z−1K_P/T_Q2R_;` |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P16 (bit 2)** | Whether reading/writing of system variables is to be executed during tool path check | | **P16** (bit 2) = 0<br>Reading/writing of system variables is not executed during tool path check.<br>**P16** (bit 2) = 1<br>Reading/writing is executed during tool path check. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P16 (bit 3)** | EIA format selection - Standard EIA/ISO format or T32 compatible format | | **P16** (bit 3) = 0<br>T32 compatible format<br>**P16** (bit 3) = 1<br>Standard EIA/ISO format |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P16 (bit 4)** | Macro interrupt valid/invalid | | **P16** (bit 4) = 0<br>Macro interrupt signals are not used to make macro interrupt program execution invalid<br><br>**P16** (bit 4) = 1<br>Macro interrupt signals are used to make macro interrupt program execution valid. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P16 (bit 5)** | Selection of the type of interrupt program call for macro interruption - Macro type or subprogram type | | **P16** (bit 5) = 0<br>Macro type (G65) [arguments can be used].<br><br>**P16** (bit 5) = 1<br>Subprogram type (M98) [arguments cannot be used]. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P16 (bit 6)** | Whether local variables are to be cleared by resetting | | **P16** (bit 6) =0<br>Local variables from #1 to #33 are not cleared to <voids> by resetting.<br>**P16** (bit 6) = 1<br>Local variables from #1 to #33 are cleared to <voids> by restting. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P16 (bit 7)** | Whether common variables are to be cleared by resetting | | **P16** (bit 7) = 0<br>Common variables from #100 to #149 are not cleared to <voids> by resetting.<br><br>**P16** (bit 7) = 1<br>Common variables from #100 to #149 are cleared to <voids> by resetting. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | Description |
|---|---|---|
| **P17** | Selection of tool change position specification code | Specify tool change position from 1 through 8 below. |




NM211-00215

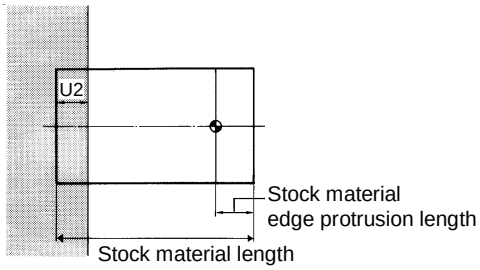
Zc : Stock material edge projection length
Dmax : Stock material maximum outside diameter
βx : Tool turning clearance (X-axis) **U1**/2
βz : Tool turning clearance (Z-axis) **U2**
Lx : Length of the longest tool in X direction
Lz : Length of the longest tool in Z direction

| Setting | X-axis | Z-axis |
|---|---|---|
| 0 | Clearance position | Clearance position |
| 1 | Machine origin point | Clearance position |
| 2 | Clearance position | Machine origin point |
| 3 | Machine origin point | Machine origin point |
| 4 | Fixed point | Fixed point |
| 5 | Clearance position | End point of previous machining |
| 6 | Machine origin point | End point of previous machining |
| 7 | End point of previous machining | Clearance position |
| 8 | End point of previous machining | Machine origin point |

**Note:**

**P17**=5 or 6, Z-axis tool change position is identical with the end point of previous machining. In the case below, however, this may not be applied.

As shown here, if the longest tool comes into the hatched portion, the position will escape in Z-axis direction by the distance determined by **U2**.




NM211-00216

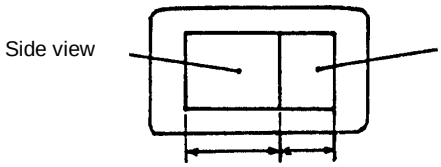
| Unit | — |
|---|---|
| Effective condition | Instant |
| Applicable program | M |

(⇨**U1**, **U2**, **A5**)

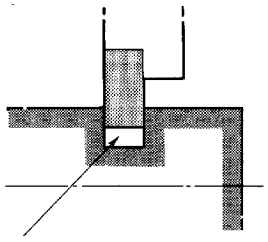
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P18</td><td colspan="2">Selection of spare tool indexing condition</td><td>Select spare tool indexing conditions below.<br><table><tr><th>Setting</th><th>Description</th></tr><tr><td>1</td><td>Indexing of spare tool when number of machined workpieces has reached limit</td></tr><tr><td>2</td><td>Indexing of spare tool when tool use time has reached limit</td></tr><tr><td>4</td><td>Indexing of spare tool when tool wear amount X has exceeded limit</td></tr><tr><td>8</td><td>Indexing of spare tool when tool wear amount Z has exceeded limit</td></tr><tr><td>16</td><td>Indexing of spare tool when tool wear amount Y has exceeded limit</td></tr></table>To combine the several conditions listed above, set the sum total of setting numbers corresponding the conditions to be selected.<br>Example:<br>To combine the workpiece machining quantity and tool wear amount X, set 5 (1 + 4).</td></tr>
<tr><td>Unit</td><td>—</td><td rowspan="3"></td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">P19</td><td colspan="2">Selection of data unit system (metric or inch)</td><td>Specify input data unit system.<br>P19 = 0 Data input in mm<br>Minimum command unit .....0.001 mm<br>P19 = 1 Data input in inch<br>Minimum command unit .....0.0001 inches<br>P19 = 2 Data input in mm<br>Minimum command unit .....0.0001 mm<br>P19 = 3 Data input in inch<br>Minimum command unit .....0.00001 inches<br>P19 = 5<br>A rotational speed of 88 min$^{-1}$ or more can be specified for the C-axis (rotational axis) under the inch specifications of the machine.<br>To specify a rotational speed of 88 min$^{-1}$ or more, enter C-axial feed command data without a decimal point.<br>Example:<br>To specify 400 min$^{-1}$ (144000 deg/min) as the rotational speed, enter feed command F as shown below.<br>F = 400 × 360 × 100 = 14400000<br>Notes:<br>1. When this parameter is changed, data below must also be changed.<br>- Parameters whose data are to be recorded for mm and inch.<br>- Cutting condition data<br>Mere change of P19 will not convert automatically above data.<br>2. The setting of P19 = 2 or 3 is for EIA/ISO programs only. MAZATROL programs cannot be executed with this setting.<br>3. In the case of P19 = 5, the rotational speed is limited according to the particular specifications of the machine.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power OFF → ON</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

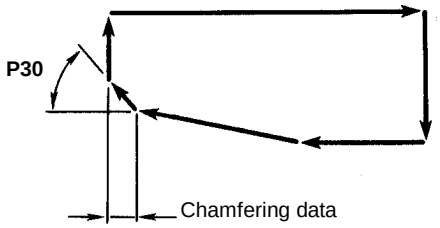
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P20</td><td colspan="2">Measurement retry frequency in C offset measurement unit (MES-COF)</td><td rowspan="4">When touch sensor is actuated before reaching target point in C offset measurement, set retry frequency.<br>P20 is set to N (N=0～3), measurement alarm will be indicated when touch sensor is actuated before reaching measurement target point in (N+1)th retry operation.<br><br>(⇨U61)</td></tr>
<tr><td>Unit</td><td>Times</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">P21</td><td colspan="2">Selection of separating ratio of GRAPHIC display</td><td rowspan="4">Selection of separation ratio between side view and front view (or rear view) when two split plane indication mode has been selected.<br>P21 = 0 ..... 1:1<br>P21 = 1 ..... 2:1<br>P21 = 2 ..... 5:1<br><br>Example: P21 = 1<br>GRAPHIC<br>  <br><br>NM211-00217</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">P22</td><td colspan="2">Tool command time for simulation</td><td rowspan="4">Setting of T command execution time (tool change time) at 0.05 sec intervals for simulation<br>Example:<br>Set 20 for 1 sec, and 20 × N for N sec.</td></tr>
<tr><td>Unit</td><td>0.05 sec</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

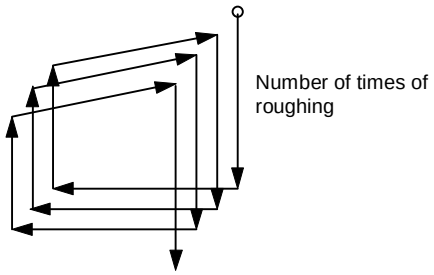
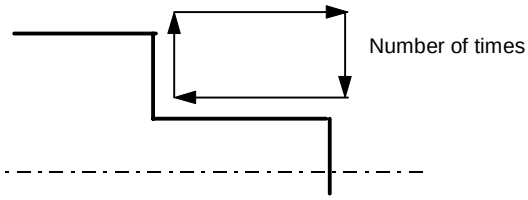
| Address | Meaning | | Description |
|---|---|---|---|
| **P23** | Auxiliary command time for simulation | | Setting of M code and gear change execution time at 0.05 sec intervals for simulation |
| | Unit | 0.05 sec | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P24** | Dwell (specification of spindle rotation number) at groove bottom in groove cutting unit (GRV) | | Tool will stop at groove bottom while spindle rotates N times when **P24** is set to N (N = 0 to 255).<br>  <br>Remaining at groove bottom until the spindle rotates N times.<br>NM211-00218 |
| | Unit | Revolutions | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P26** | Selection of escape pattern from wall (90°) in rough cutting cycle | | This parameter will be used to select escape pattern (0, 1 or 2) when wall is vertical in G71/G72 mode.<br>**P26** = 0 .....Identical with ordinary path<br>**P26** = 1 .....Escape at 45° from wall<br>**P26** = 2 .....Feedrate accelerated at wall<br>Accelerated feedrate F is expressed as follows.<br>$F = F_o \times \frac{K3}{100}$<br>(where $F_0$=Feedrate specified in program)<br>(⇨**K3**) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P27** | Specification of first M code for milling axis gear selection | | This parameter automatically determines milling axis gear. Output M code will be as shown below if **P27** is set to n. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Gear | 1st step | 2nd step | 3rd step | 4th step |
|---|---|---|---|---|
| M code | n | n + 1 | n + 2 | n + 3 |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P28</td><td colspan="2">Specification of first M code for spindle gear selection</td><td rowspan="4">This parameter automatically determines spindle gear.<br>Output M code will be as shown below if P28 is set to n.<br><br><table><tr><td>Gear</td><td>1st step</td><td>2nd step</td><td>3rd step</td><td>4th step</td></tr><tr><td>M-code</td><td>n</td><td>n + 1</td><td>n + 2</td><td>n + 3</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">P29</td><td colspan="2">Specification of first M code for parts catcher control</td><td rowspan="4">It is a parameter to automatically control the parts catcher.<br>If the set value of P29 is set to n, M code of No. n (parts catcher forward) is outputted at the start of cutting off (GRV #4, #5), and M code of No. n+1 (Parts catcher backward) is outputted at the end.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">P30</td><td colspan="2">Threading chamfering angle</td><td rowspan="4">Set chamfering angle at thread portion in thread cutting cycle (G76/G92)<br>  <br><br>NM211-00219<br>Note:<br>Set 45 or 60.</td></tr>
<tr><td>Unit</td><td>Degree</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P31</td><td colspan="2">Simultaneous operation pattern for transfer</td><td rowspan="4">Simultaneous operation pattern for transfer of workpieces between two unit jobsites<br><br>P31 = 1<br>Rotation of the spindle and movement of the Z-axis<br><br>P31 = 2<br>Orientation of the spindle and movement of the Z-axis<br><br>P31 = 4<br>Positioning of the C-axis and movement of the Z-axis simultaneously occur.<br><br>Note:<br>To combine patterns, set the sum total of setting numbers corresponding the conditions.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P32** | Threading termination waiting time processing | | Set a threading termination waiting time.<br>**P32 =** 0 - 1<br>128 - 256 No waiting time<br>**P32** = 2 - 127 (Setting – 1) × 3.5 msec |
| | Unit | 3.5 msec | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P33** | Number of times of roughing in the composite-type fixed cycle (G73) | | If the number of times of roughing has not been specified in the program, operation will occur in accordance with the setting of this parameter.<br>  <br> |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P34** | Final finishing repeat times in the composite-type fixed cycle (G76) | | If the number of times of repetition has not been specified in the program, operation will occur in accordance with the setting of this parameter.<br>  <br> |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P35**<br>**P36**<br>**P37** | Maximum workpiece length range on the CUT LEARN display | | These parameters specify the maximum workpiece length range to be displayed on the CUT LEARN display.<br>Data must be set so that a relational expression of **P35** < **P36** < **P37** holds. |
| | Unit | mm or 0.1 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

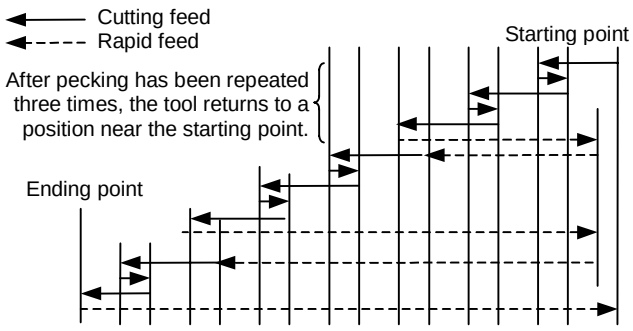
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P38**<br>**P39**<br>**P40** | Maximum workpiece outside diameter range on the CUT LEARN display | | These parameters specify the maximum workpiece outside diameter range to be displayed on the CUT LEARN display.<br>Data must be set so that a relational expression of **P38** < **P39** < **P40** holds. |
| | Unit | mm or 0.1 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P41**<br>**P42** | Macro call G code | | Set the G-code to be used for macro call.<br>The macroprogram number corresponding to this G-code is to be set in parameter **P49** or **P50**.<br>**Note:**<br>This section is a continuing part of the section of parameters **K81** - **K88**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P43**<br>**P44**<br>**P45**<br>**P46**<br>**P47** | Macro call M code | | Set the M-code to be used for macro call.<br>The macroprogram number corresponding to this M-code is to be set in parameter **P51**, **P52**, **P53**, **P54** and **P55**.<br>**Note:**<br>This section is a continuing part of the section of parameters **K89** - **K93**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P49**<br>**P50** | Macro program number corresponding to the macro call G code | | Set the macroprogram number corresponding to the G-code to be used for macro call.<br>The parameters **P49** and **P50** correspond with the parameters **P41** and **P42** respectively. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P51**<br>**P52**<br>**P53**<br>**P54**<br>**P55** | Macro program number corresponding to the macro call M code | | Set the macroprogram number corresponding to the M-code to be used for macro call.<br>The parameters **P51** - **P55** correspond with the parameters **P43** and **P47** respectively. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P57**<br>**P58**<br>**P59** | Subprogram call M-code | | Set the M-code to be used for subprogram call.<br>The subprogram number corresponding to this M-code is to be set in parameter **P60**, **P61** and **P62**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P60**<br>**P61**<br>**P62** | Subprogram number corresponding to the subprogram call M code | | Set the subprogram number corresponding to the M-code to be used for subprogram call.<br>The parameters **P60**, **P61** and **P62** correspond with the parameters **P57**, **P58** and **P59**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P63** | Upward cutting speed for inside threading (THR IN) | | Specify the upward cutting speed for inside threading.<br>- Valid only when chamfering is not specified by the THR IN unit in the MAZATROL program.<br>- Valid only when bit 2 of parameter **P111** is set to 1 (that is, the upward cutting speed for inside threading is valid).<br>- If bit 2 of parameter **P111** is set to 0, the upward cutting speed for inside threading will be the same as the setting of parameter **A4**.<br>- If the setting of this **P63** parameter is 0, the upward cutting speed will be 1/4 of the **A1** parameter setting. |
| | Unit | mm/min or<br>0.1 inches/min | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

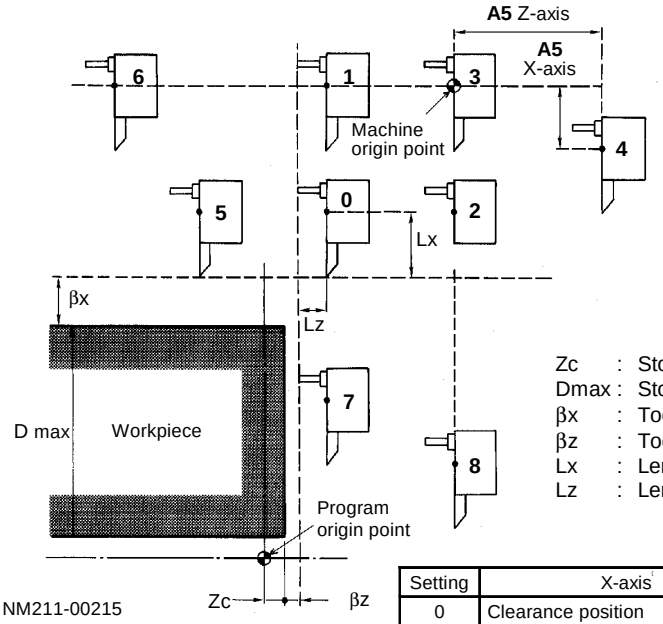
| Address | Meaning | | Description |
|---|---|---|---|
| **P65** | Selection about tape operation mode data input | | Select from where the program is to be read during the tape operation mode.<br>**P65** = 0<br>The program to be executed will be read from the tape reader.<br>**P65** = 1<br>The program to be executed will be read from the operating area of the hard disk. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P66** | Method of judging whether the life of the tool is approaching | | **P66** = 0<br>When the rate of the cumulative operating time of the tool to its estimated life decreases below the value of **P67**, the system will judge the life of that tool to be approaching.<br>**P66** = 1<br>When the residual life of the tool decreases below the value of **P67**, the system will judge the life of that tool to be approaching. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P67** | Criteria for judging whether the life of the tool is approaching | | When **P66** = 0<br>When the rate of the cumulative operating time of the tool to its estimated life decreases below the setting of this parameter, the system will judge the life of that tool to be approaching.<br>When **P66** = 1<br>When the residual life of the tool decreases below the setting of this parameter, the system will judge the life of that tool to be approaching.<br>The above judgement is not applied when **P67** = 0 |
| | Unit | % or minute | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P73** | Number of times of pecking up to the return of the tool to a position near the starting point of the #4 or #[4] very-deep-hole drilling cycle of a DRL or MDR unit | | Set the number of times of pecking to be executed before returning the tool to a position near the starting point of the #4 or #[4] very-deep-hole drilling cycle of a DRL or MDR unit.<br>**Example:** If **P73** = 3 :<br>  <br> |
| | Unit | Times | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P74** | Tool drawing accuracy in solid mode | | As a larger value is set here, drawing accuracy increases in solid mode of TOOL PATH display. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P76** | Selection of the shape correction function of the MAZATROL program | | To select whether the shape correction function of the MAZATROL program is always effective or ineffective.<br>0: Ineffective<br>1: Effective |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P77** | Selection of whether the C-axis on the WORK OFFSET display for the No. 2 spindle is to be made valid or invalid | | Use **P77** to select whether the C-axis that has been set on the WORK OFFSET display valid or invalid for the spindle No. 2 of the machine equipped with the C-axis or of the machine provided with a 0.001-degree index (orientation) function.<br>0: Invalid<br>1: Valid |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | Description |
|---|---|---|
| **P95** | Selection of tool change position specification code for FLASH-tool or multi-tool holder | When a FLASH-tool or multi-tool holder is used, specify the position for indexing the tool, namely, the tool change position for indexing the tool of the same TNo. at the same B-axis angle during programmed operation.<br>In all other cases, the tool change position specified by **P17** becomes valid. |

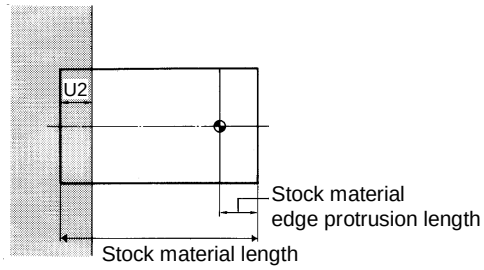



NM211-00215

Zc : Stock material edge projection length
Dmax : Stock material maximum outside diameter
βx : Tool turning clearance (X-axis) **U1**/2
βz : Tool turning clearance (Z-axis) **U2**
Lx : Length of the longest tool in X direction
Lz : Length of the longest tool in Z direction

| Setting | X-axis | Z-axis |
|---|---|---|
| 0 | Clearance position | Clearance position |
| 1 | Machine origin point | Clearance position |
| 2 | Clearance position | Machine origin point |
| 3 | Machine origin point | Machine origin point |
| 4 | Fixed point | Fixed point |
| 5 | Clearance position | End point of previous machining |
| 6 | Machine origin point | End point of previous machining |
| 7 | End point of previous machining | Clearance position |
| 8 | End point of previous machining | Machine origin point |

**Note:**
When **P95**=5 or 6, Z-axis tool change position is identical with the end point of previous machining. In the case below, however, this may not be applied.
As shown here, if the longest tool comes into the hatched portion, the position will escape in Z-axis direction by the distance determined by **U2**.

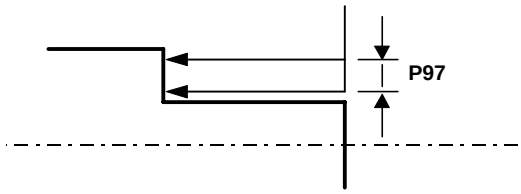
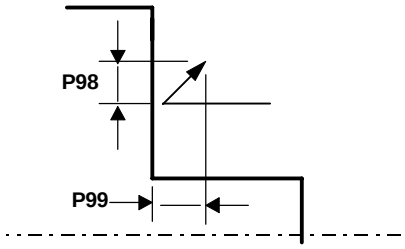



NM211-00216

| Unit | — |
|---|---|
| Effective condition | Instant |
| Applicable program | M |

(⇨**U1**, **U2**, **A5**)

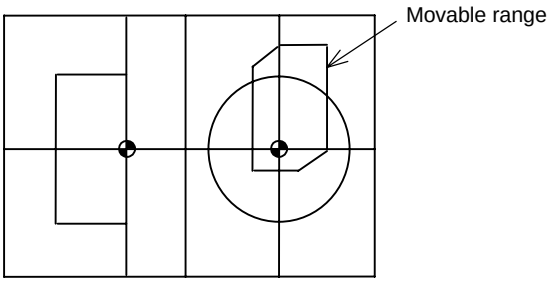
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P97** | Cutting depth in the composite-type fixed cycle (G71/G72) | | If a cutting depth has not been specified in the program, operation will occur in accordance with the setting of this parameter.<br>  |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P98** | Amount of escape in an X-axial direction during the composite-type fixed cycle (G73) | | If the amount of escape has not been specified in the program, operation will occur in accordance with the setting of this parameter.<br>  |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P99** | Amount of escape in a Z-axial direction during the composite-type fixed cycle (G73) | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P100** | Pitch of tapping tool for display in detail in solid mode | | Set the pitch of tapping tool displayed when the tapping tool is displayed in detail (**P4** bit 1 = 1) in solid mode on TOOL PATH display. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P101** | Thread depth of tapping tool for display in detail in solid mode | | Set the thread depth of tapping tool displayed when the tapping tool is displayed in detail (**P4** bit 1 = 1) in solid mode on TOOL PATH display. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P105 (bit 1)** | EIA macroprogram call help function valid/invalid in MAZATROL screen mode | | Select whether to make valid or invalid the function for supporting the entry of macrovariables by displaying argument information and special help screen information when calling up an EIA macroprogram as a subprogram from the MAZATROL program.<br>If **P105** (bit 1) = 0 : Invalid<br>If **P105** (bit 1) = 1: Valid |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P105 (bit 2)** | Cutting conditions studying function valid or invalid | | If **P105** (bit 2) = 0 : Invalid<br>If **P105** (bit 2) = 1 : Valid |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P105 (bit 3)** | Fixed-amount offset function valid or invalid | | If **P105** (bit 3) = 0 : Invalid<br>If **P105** (bit 3) = 1 : Valid |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

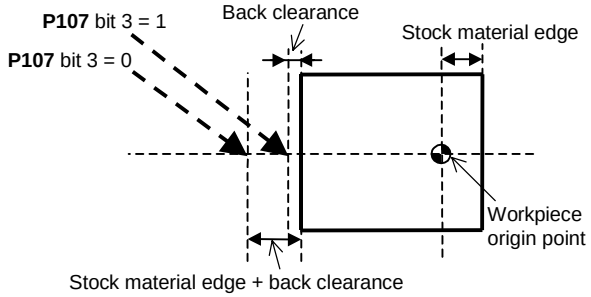
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P105 (bit 4)** | Whether the movable range of the inclined Y-axis is to be drawn on the TRACE display | | If **P105** (bit 4) = 0 : Not drawn<br>If **P105** (bit 4) = 1 : Drawn<br>Example of drawing:<br>  <br> |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P105 (bit 6)** | Text input/output valid/invalid for data I/O | | **P105** (bit 6) = 0:<br>The text input/output functions are invalid for hard disk, floppy disk, or memory card I/O.<br>**P105** (bit 6) = 1:<br>The text input/output functions are valid for hard disk, floppy disk, or memory card I/O. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P106 (bit 0)** | Handling when the lives of all the same group number tools are reached in a standard EIA/ISO mode | | If **P106** (bit 0) = 0:<br>An alarm will result when all tools reach their respective lives.<br>If **P106** (bit 0) = 1:<br>Operation will continue when all tools reach their respective lives. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P106 (bit 1)** | Method of estimating a residual life in standard EIA/ISO mode | | If **P106** (bit 1) = 0:<br>The residual tool life can be estimated from the number of machined workpieces.<br>If **P106** (bit 1) = 1:<br>The residual tool life can be estimated from the number of times of T-command execution. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

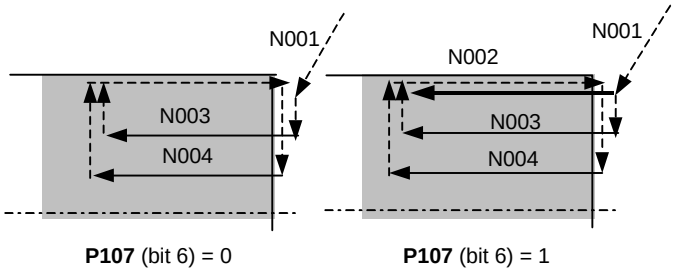
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P106 (bit 2)** | Hard disk, floppy disk, and/or memory card input/output<br>Conditions for loading the machining program of the same work number | | Set up the hard disk, floppy disk, and/or memory card input/output bit to select whether the program of the same work number as that of the program registered in the NC unit is to be loaded.<br>If **P106** (bit 2) = 0:<br>The current program data will not be updated and an alarm will be displayed.<br>If **P106** (bit 2) = 1:<br>The current program data will be updated. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P106 (bit 3)** | Selection of the display mode of ID numbers on the TOOL DATA display - Decimal or hexadecimal display | | This parameter specifies whether the ID numbers on the TOOL DATA display are to be displayed in a decimal format or a hexadecimal format.<br>If **P106** (bit 3) = 0 : Decimal display<br>If **P106** (bit 3) = 1 : Hexadecimal display |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P106 (bit 5)** | Tool set data protection in the automatic operation mode | | If **P106** (bit 5) = 0:<br>The tool set data can be rewritten even in the automatic operation mode.<br>If **P106** (bit 5) = 1:<br>The tool set data can not be rewritten in the automatic operation mode. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P106 (bit 6)** | Selection of whether the GRAPHIC MAINTE. display is to be automatically displayed when the specific alarm occurs | | If **P106** (bit 6) = 0 :<br>The GRAPHIC MAINTE. display does not appear, even though one of the specific alarms occurs.<br>If **P106** (bit 6) = 1 :<br>The GRAPHIC MAINTE. display appears, when one of the specific alarms occurs. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P106 (bit 7)** | Selection of whether the ALARM NAVIGATION window is to be automatically displayed when the specific alarm occurs | | If **P106** (bit 7) = 0 :<br>The ALARM NAVIGATION window does not appear, even though one of the specific alarms occurs.<br>If **P106** (bit 7) = 1 :<br>The ALARM NAVIGATION window appears, when one of the specific alarms occurs. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P107 (bit 0)** | Whether workpiece and finishing shape data is to be output during EIA conversion output | | This parameter specifies whether the shape data of workpieces and finishing figures is to be output at the end of the program data.<br>If **P107** (bit 0) = 0 : Data is output.<br>If **P107** (bit 0) = 1 : Data is not output. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P107 (bit 2)** | Selection of G0/G1 EIA conversion output during the polar coordinate mode (G12.1) | | If **P107** (bit 2) = 0 :<br>Positioning data during the polar coordinate mode is output with G0.<br>If **P107** (bit 2) = 1 :<br>Positioning data during the polar coordinate mode is output with G1. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P107 (bit 3)** | Selection of the approach operation for machining with the No. 2 spindle | | Select the approach operation for machining with the No. 2 spindle.<br>If **P107** (bit 3) = 0 :<br>The machine approaches the position that allows for the stock material edge.<br>If **P107** (bit 3)= 1 :<br>The machine approaches the back clearance position.<br>  |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P107 (bit 4)** | Selection of a FLASH-tool life management method | | If **P107** (bit 4) = 0 :<br>If there is a tip which has not reached its life, the turning tool is not changed for a spare.<br>However, when multiple tips are to be used for a milling tool, the change for a spare tool is conducted if even one of the tips to be used has already arrived at its life.<br>If **P107** (bit 4) = 1 :<br>Even one tip whose total operation time is already in excess of a predetermined life, that FLASH-tool is judged to have reached its life and is therefore changed for a spare. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P107 (bit 5)** | Selection of whether to hold spindle status during transfer (TRS) (machine with sub-spindle) | | If **P107** (bit 5) = 0 :<br>Spindle status is not held at the TRS unit when the workpiece is transferred.<br>If **P107** (bit 5) = 1 :<br>Spindle status is held at the TRS unit when the workpiece is transferred. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P107 (bit 6)** | Selection of whether to execute the turning cycle when the approach point and ending point of G90/G94 match. | | Select whether the fixed turning cycle specified in G90/G94 is to be executed when the approach point and ending point of the command block match.<br>If **P107** (bit 6) = 0 : The cutting cycle is not executed.<br>If **P107** (bit 6) = 1 : The cutting cycle is executed.<br>**Example:**<br>`N001 G00 X46.Z2.`<br>`N002 G90 X46.Z-25.F0.3`<br>`N003 X42.`<br>`N004 X38.`<br>  <br><br>**P107** (bit 6) = 0 **P107** (bit 6) = 1 |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P107 (bit 7)** | Selection of the Z/C offset to be used for the subprogram when a subprogram call is performed from the MAZATROL program to the EIA program | | If **P108** (bit 5) = 1 (the subprogram operates with the Z/C offset value specified in the main program), select the Z/C offset value to be used for the subprogram.<br>If **P107** (bit 7) = 0 :<br>The Z/C offset value in the “SET UP DATA” of the main program will be used.<br>If **P107** (bit 7) = 1 :<br>The Z/C offset value in the “TRANSFER INFORMATION” of the main program will be used. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P108 (bit 0)** | How to handle EOR (%) - M02 or M30 | | This parameter specifies whether designated EOR (%) is to be handled as M02 or M30.<br>If **P108** (bit 0) = 0 : Handled as M30.<br>If **P108** (bit 0) = 1 : Handled as M02. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P108 (bit 1)** | Execution mode selection for a fixed turning cycle | | In the fixed turning cycle mode (G90/G92/G94)<br>If **P108** (bit 1) = 0 :<br>The fixed turning cycle is executed for each block.<br>If **P108** (bit 1) = 1 :<br>The fixed turning cycle is executed only for movement blocks. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P108 (bit 2)** | Form of single-block stop during a fixed turning cycle | | This parameter specifies whether single-block operation during a fixed turning cycle (G90, G92 or G94) is to be stopped after the entire cycle has been executed, or for each block.<br>If **P108** (bit 2) = 0 :<br>After execution of the cycle<br>If **P108** (bit 2) = 1 :<br>For each block |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">P108<br>(bit 3)</td><td colspan="2">T-command compensation</td><td rowspan="4">The types of axes which undergo simultaneous compensation with execution of a move command in accordance with parameter P13 (bit 0) = 0 can be changed as follows:<br><table><tr><th></th><th>P16 bit 3 = 0</th><th>P16 bit 3 = 1</th></tr><tr><td>P108<br>bit 3 = 0</td><td>Only the designated axis undergoes compensation.</td><td>Only the designated axis undergoes compensation.</td></tr><tr><td>P108<br>bit 3 = 1</td><td>The X-, Y-, and Z-axes undergo compensation.</td><td>Only the designated axis undergoes compensation.</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P108<br>(bit 4)</td><td colspan="2">Whether to output M30 for a tool whose life has been reached</td><td rowspan="4">Set whether M30 is to be output to the PC if a tool life alarm occurs in the MAZATROL or EIA/ISO program.<br>If P108 (bit 4) = 0 :<br>Output (standard, conventional type)<br>If P108 (bit 4) = 1 :<br>No output (FLEX robot type)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">P108<br>(bit 5)</td><td colspan="2">Whether to use the Z-offset existing when a subprogram call is performed from the MAZATROL program to an EIA/ISO program</td><td rowspan="4">If P108 (bit 5) = 0 :<br>The subprogram operates at the Z/C offsets that have been set with WNo. of the subprogram.<br>If P108 (bit 5) = 1 :<br>The subprogram operates at the Z/C offsets that have been set with WNo. of the main program.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">P108<br>(bit 6)</td><td colspan="2">Selection of the system variable for modal information reading</td><td rowspan="4"><table><tr><th>System variable</th><th>Group number</th><th>P108 bit 6 = 0</th><th>P108 bit 6 = 1</th></tr><tr><td>#4001<br>·<br>·<br>·<br>·<br>·<br>#4023</td><td>Group 01<br>·<br>·<br>·<br>·<br>·<br>Group 23</td><td>The group numbers at left apply only to T32 EIA.</td><td>The group numbers at left apply only to standard EIA.</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P108 (bit 7)** | Selection of output codes for macro external output instructions (BPRNT, DPRNT) | | Select the output codes for macro external output instructions (BPRNT, DPRNT).<br>If **P108** (bit 7) = 0 : ISO output<br>If **P108** (bit 7) = 1 : ASCII output |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P109 (bit 0)** | Program protect flag<br>(Whether editing of the programs of the order of WNo. 9000 is to be prohibited) | | This parameter specifies whether editing of the programs of the order of WNo. 9000 is to be prohibited.<br>If **P109** (bit 0) = 0 : Not prohibited<br>If **P109** (bit 0) = 1 : Prohibited |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P109 (bit 1)** | Program protect flag<br>(Whether displaying of the programs of the order of WNo. 9000 is to be prohibited) | | This parameter specifies whether displaying of the programs of the order of WNo. 9000 is to be prohibited.<br>If **P109** (bit 1) = 0 : Not prohibited<br>If **P109** (bit 1) = 1 : Prohibited |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P109 (bit 2)** | Whether to save the data as an additional one during hard disk/floppy disk input/output | | Specify whether the data is to be saved as an additional one during hard disk/floppy disk input/output.<br>If **P109** (bit 2) = 0 :<br>The data is saved in overwritten form.<br>If **P109** (bit 2) = 1 :<br>The data is saved as an additional one.<br>**Example:**<br>Data is saved in an existing “FILE” folder.<br><FILE><br>Program 100<br>User paremeter<br>Tool data<br>Saving<br>Program 200<br>User parameter<br>Saving results in the case of **P109** (bit 2) = 0<br><FILE><br>Program 200<br>User parameter<br>The old data existing before saving was executed is overwritten with the newly saved data.<br>Saving results in the case of **P109** (bit 2) = 1<br><FILE><br>Program 100, 200<br>User parameter<br>Tool data<br>Newly saved data is added.<br>If the same data already exists, this data will be overwritten.<br>(User parameter) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P109 (bit 4)** | Program protect flag<br>(Whether editing of the programs of the order of WNo. 8000 and WNo. 9000 is to be prohibited.) | | This parameter specifies whether editing of the programs of the order of WNo. 8000 and WNo. 9000 is to be prohibited.<br>If **P109** (bit 4) = 0 : Not prohibited<br>If **P109** (bit 4) = 1 : Prohibited |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P109 (bit 5)** | Program protect flag<br>(Whether displaying of the programs of the order of WNo. 8000 and WNo. 9000 is to be prohibited.) | | This parameter specifies whether displaying of the programs of the order of WNo. 8000 and WNo. 9000 is to be prohibited.<br>If **P109** (bit 5) = 0 : Not prohibited<br>If **P109** (bit 5) = 1 : Prohibited |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P109 (bit 6)** | Selection of an alarm checking method for data input/output program saving | | This parameter specifies when an alarm occurs if a program not present in the NC memory is specified during data input/output program saving.<br>If **P109** (bit 6) = 0 :<br>An alarm occurs immediately before the specified program is saved.<br>If **P109** (bit 9)= 1 :<br>An alarm occurs on selection of the saving start menu. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P109 (bit 7)** | Selection of the jaw data reference method | | Specify the jaw data reference method.<br>If **P109** (bit 7) = 0 :<br>Reference using the code number of the jaw.<br>If **P109** (bit 7) = 1 :<br>Reference using the name of the jaw. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P110 (bit 0)** | Power-on display selection | | If **P110** (bit 0) = 0 :<br>Then the POSITION display is selected.<br>If **P110** (bit 0) = 1 :<br>Then the MAINTENANCE CHECK display is selected. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P110 (bit 1)** | Page extension on the MAINTENANCE CHECK display | | If **P110** (bit 1) = 0 :<br>Then the page can be extended to a maximum of two pages.<br>If **P110** (bit 1) = 1 :<br>Then the page can be extended to a maximum of three pages. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **P110 (bit 2)** | When the visual tool ID/data management functions are valid — Stored tools registration function on the VISUAL TOOL MANAGER display valid/invalid | | Specify whether the stored tools registration function on the VISUAL TOOL MANAGER display is to be made valid or invalid when the visual tool ID/data management functions are valid.<br>If **P110** (bit 2) = 0 :<br>The stored tools registration function is invalid.<br>If **P110** (bit 2) = 1 :<br>The stored tools registration function is valid. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | **Note:**<br>When **P110** (bit 2) is set to 0, the STOCK TOOL menu item will not be displayed. |
| **P110 (bit 6)** | Tool length input valid or not | | If **P110** (bit 6) = 0 :<br>Tool length input is invalid.<br>If **P110** (bit 6) = 1 :<br>Tool length input is valid. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P111 (bit 0)** | M-command execution time processing | | If **P111** (bit 0) = 0 :<br>The M-command execution time is processed as zero during time study of tool path checking.<br>If **P111** (bit 0) = 1 :<br>During time study of tool path checking, the M-command execution time is added in accordance with the particular setting of parameter **P23**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P111 (bit 1)** | T-command execution time processing | | If **P111** (bit 1) = 0 :<br>The T-command execution time is processed as zero during time study of tool path checking.<br>If **P111** (bit 1) = 1 :<br>During time study of tool path checking, the T-command execution time is added in accordance with the particular setting of parameter **P22**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

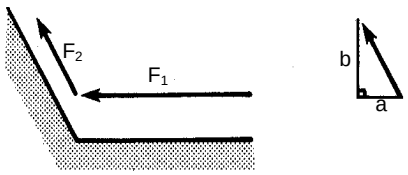
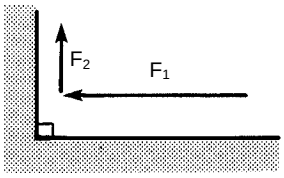
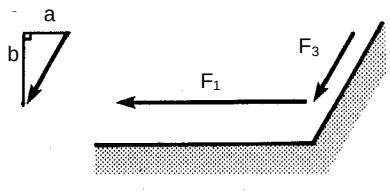
| Address | Meaning | | Description |
|---|---|---|---|
| **P111 (bit 2)** | Upward cutting speed valid/invalid for inside diameter threading (THR IN) | | Specify whether the upward cutting speed for inside threading is to be made valid or invalid.<br>1: Valid (the upward cutting speed for inside diameter threading is set to the value of the **P63** parameter)<br>0: Invalid (the upward cutting speed for inside diameter threading is set to the normal value of the **A4** parameter) |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **P111 (bit 5)** | Using angle tool holder valid/invalid | | If **P111** (bit 5) = 0 :<br>Angle tool holder can not be used.<br>If **P111** (bit 5) = 1 :<br>Angle tool holder can be used. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **P111 (bit 6)** | EIA tool command suffix valid/invalid | | Specify whether the assignment of the tool identification code (suffix) by the T-command of the 640MT is valid or invalid.<br>If **P111** (bit 6) = 0 :<br>The EIA tool command suffix is invalid.<br>If **P111** (bit 6) = 1 :<br>The EIA tool command suffix is valid.<br>**Note:** This parameter is valid only for the tool name method. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **P111 (bit 7)** | Selection of the method of moving axes to the tool change position | | If **P111** (bit 7) = 0 :<br>The X-axis and the Z-axis simultaneously move to the tool change position specified by **P17** or **P95**.<br>**Note:**<br>When the tool nose stays within the (workpiece diameter + safety profile clearance), both axes move past the clearance position.<br>If **P111** (bit 7) = 1 :<br>The X-axis first or then the Z-axis move to the tool change position specified by **P17** or **P95**.<br>**Note:**<br>When the tool nose stays within the (workpiece diameter + safety profile clearance), only the X-axis moves past the clearance position and the Z-axis does not move. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

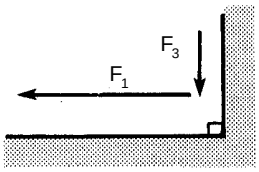
| Address | Meaning | | Description |
|---|---|---|---|
| **P112** | Selection of measurement data items to be printed out | | Selection of printout items in measurement data printout<br>7 6 5 4 3 2 1 0 (0: Not printout 1: Print out)<br>Work No., Unit No.<br>Tool No., Work counter<br>Measurement mode<br>Target data<br>Measurement data<br>Offset data<br>Tolerance upper/lower<br>Day and time of measurement |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

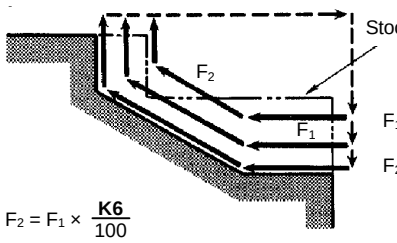
## 3-3 PARAMETER (USER, CUTTING K)

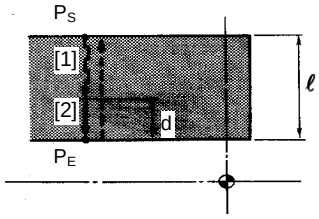
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K1</td><td colspan="2">Cut depth reduction rate for rough cutting in bar machining unit (BAR)</td><td rowspan="4">Cut depth can be reduced as remaining workpiece thickness becomes less in rough cutting in bar machining unit (BAR). Reduced cut depth (A) can be expressed by<br>$A = T \times \frac{K1}{100}$<br>where T=Remaining thickness (radial value).<br><br>Note:<br>Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K2</td><td colspan="2">Acceleration rate in up-going taper for rough cutting in bar machining unit (BAR)</td><td rowspan="4">  <br><br>NM211-00262<br>$F_2 = F_1 \times \frac{K2}{100} \times \left|\frac{b}{a}\right|$ $F_1$ : Feedrate for rough cutting<br>$F_2$ : Increased feedrate<br><br>Notes:<br>1. This is effective only when P1 (bit 0)=1.<br>2. Up to 500 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K3</td><td colspan="2">Acceleration rate in up-going wall slope (90°) for rough cutting in bar machining unit (BAR)</td><td rowspan="4">  <br><br>$F_1$ : Feedrate for rough cutting<br>$F_2$ : Increased feedrate<br>NM211-00263<br>$F_2 = F_1 \times \frac{K3}{100}$<br><br>Notes:<br>1. This is effective only when P1 (bit 0)=1.<br>2. Up to 500 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K4</td><td colspan="2">Deceleration rate in down-going taper for rough cutting in bar machining unit (BAR)</td><td rowspan="4">  <br><br>NM211-00264<br>$F_3 = F_1 \times \frac{K4}{100} \times \left|\frac{a}{b}\right|$ $F_1$ : Feedrate for rough cutting<br>$F_3$ : Reduced feedrate<br><br>Notes:<br>1. This is effective only when P1 (bit 1)=1.<br>2. Up to 500 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K5</td><td colspan="2">Deceleration rate in down-going wall slope (90°) for rough cutting in bar machining unit (BAR)</td><td rowspan="4"> 

$F_1$ : Feedrate for rough cutting<br>$F_3$ : Reduced feedrate<br>NM211-00265<br>$F_3 = F_1 \times \frac{K5}{100}$<br>Notes:<br>1. This is effective only when P1 (bit 1)=1.<br>2. Up to 500 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K6</td><td colspan="2">Acceleration rate on outside stock contour for rough cutting in copy machining unit (CPY)</td><td rowspan="4"> 

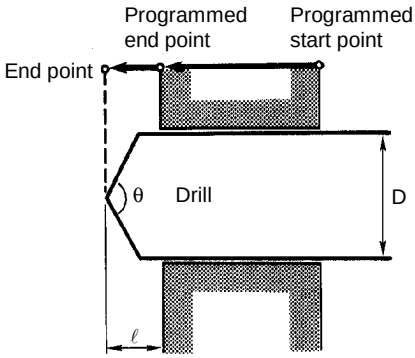
$F_1$ : Feedrate inside stock contour<br>$F_2$ : Feedrate outside stock contour<br>$F_2 = F_1 \times \frac{K6}{100}$<br>NM211-00266<br>Note:<br>Up to 500 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K8</td><td colspan="2">Rough cutting residue ratio in cutting off cycle (#4, #5) in groove cutting unit (GRV)</td><td rowspan="4"> 

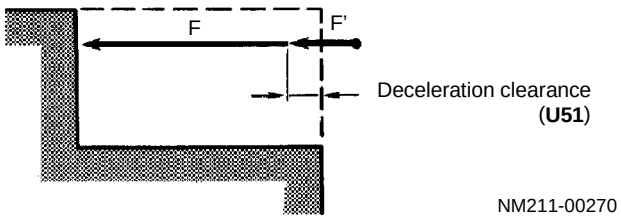
$P_S$ : Programmed start point<br>$P_E$ : Programmed end point<br>$\ell$ : Groove machining depth<br>$\ell = \overline{P_S \cdot P_E}$<br>d : Rough cutting residue<br>$d = \ell \times \frac{K8}{100}$<br>NM211-00267<br>[1] Cutting at rough cutting feedrate to a point short of end $P_E$ by distanced d<br>[2] Cutting off at finish cutting feedrate to end point $P_E$<br>Note:<br>Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K9</td><td colspan="2">Deceleration ratio for automatic corner overriding</td><td rowspan="4">Set the deceleration ratio for automatic corner overriding.<br>Note:<br>Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K10</td><td colspan="2">Cut depth allowable incremental rate for rough cutting in groove cutting unit (GRV), edge machining unit (EDG) and copy machining unit (CPY)</td><td rowspan="4">Used to calculate minimum cutting frequency in groove cutting unit (GRV), edge machining unit (EDG) and copy machining unit (CPY)<br>$d' = d\left(\frac{100 + \mathbf{K10}}{100}\right)$<br>d : Cut depth per cycle<br>d' : Allowable maximum cut depth<br>Note:<br>Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K11</td><td colspan="2">Deceleration rate at cutting start time in drilling unit (DRL, MDR)</td><td rowspan="4">End point<br>Programmed start point<br>θ Drill<br>D<br>ℓ<br>Feedrate at F' over distance ℓ from the programmed start point (DRL, MDR)<br>NM211-00268<br>$F' = F \times \frac{\mathbf{K11}}{100}$<br>F : Specified feedrate<br>F' : Feedrate at cutting start<br>$\ell = \frac{D}{2 \times \tan\theta/2}$ $(0° < \theta < 180°)$<br>$\ell = 0$ $(\theta \geq 180°)$<br>Note:<br>Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

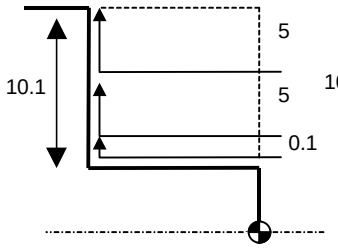
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

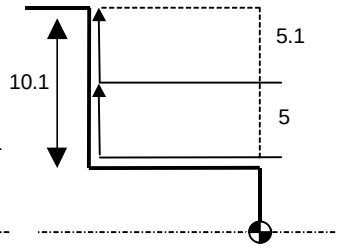
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K12</td><td colspan="2">Deceleration rate at cutting end time in drilling unit (DRL, MDR)</td><td rowspan="4"> 

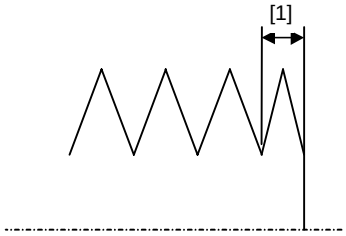
Feedrate at F' to the point distant by ℓ from the end point
NM211-00269<br>
$F' = F \times \frac{K12}{100}$ F : Specified feedrate<br>F' : Feedrate at cutting start<br>
$\begin{cases} \ell = \frac{D}{2 \times \tan\theta/2} + \frac{D}{10} & (0° < \theta < 180°) \\ \ell = \frac{D}{10} & (\theta \geq 180°) \end{cases}$<br>
Note:<br>Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K13</td><td colspan="2">Deceleration rate at rough cutting start time in bar machining unit (BAR) and copy machining unit (CPY)</td><td rowspan="4"> 

NM211-00270<br>
$F' = F \times \frac{K13}{100}$ F : Specified feedrate<br>F' : Feedrate at cutting start<br>
Note:<br>Up to 100 % can be set.<br>
(⇨U51)</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

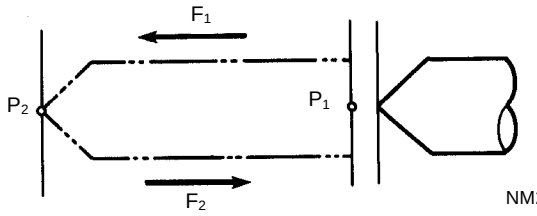
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K14</td><td colspan="2">Maximum permissible rate of increase of the initial cutting depth during BAR roughing</td><td>This parameter is valid during initial cutting in a bar roughing cycle. If the remainder obtained by dividing the thickness of cutting during the roughing cycle by the corresponding cutting depth stays within the range specified by this parameter, that value will be added to the initial cutting depth to reduce the cutting repeat times.<br><br>Example 1: K14 = 0 (R-DEP.: 5)<br> 

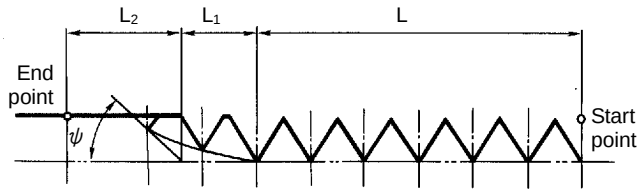
Cutting to a depth of 10.1 is executed three split times (5, 5, and 0.1).<br><br>Example 2: K14 = 10% (R-DEP.: 5)<br> 

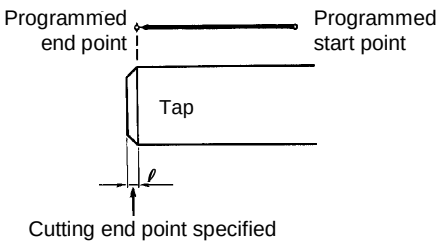
Cutting at a depth setting of X=5 results in a final cutting depth of 0.1. Since 10% of the depth setting of X=5 is 0.5 and this value is larger than the final cutting depth, this final cutting depth is added to the initial cutting depth.</td></tr>
<tr><td>Unit</td><td>%</td><td rowspan="3">Note:<br>Up to 100% can be set. When a value larger than 100% is set, it is regarded as 0.</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K15</td><td colspan="2">Pitch error correction during threading acceleration</td><td rowspan="4">Set the starting pitch error rate of threading.<br> 

Ideal pitch = Starting pitch of threading [1] + K15</td></tr>
<tr><td>Unit</td><td>0.001 mm</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K17</td><td colspan="2">Drilling cut depth calculation coefficient</td><td rowspan="4">Used for automatic determination of first cut depth in drilling<br>$d_1 = D \times \frac{\mathbf{K17}}{100}$<br>D : Drilling hole diameter<br>$d_1$ : Cut depth of first cut<br><br>Note:<br>Up to 1000 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

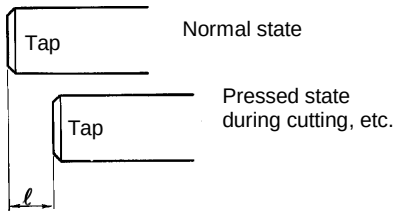
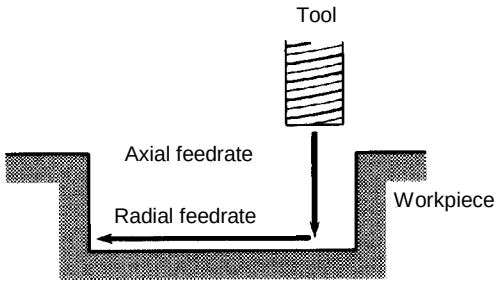
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K18</td><td colspan="2">Reamer return speed calculation coefficient</td><td rowspan="4"> 

NM211-00271<br>$F_2 = F_1 \times \frac{K18}{100}$<br>$F_1$ : Specified feedrate<br>$F_2$ : Return speed<br>$P_1$ : Start point<br>$P_2$ : End point<br>Note:<br>Up to 999 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K19</td><td colspan="2">Chamfering data calculation coefficient in thread cutting unit (THR)</td><td rowspan="4"> 

NM211-00272<br>L : Effective thread length<br>$L_1$ : Same pitch incomplete thread length (copy delay)<br>$L_2$ : Chamfering data<br>$\psi$ : Chamfering angle<br>$L_2 = L_0 \times \frac{K19}{10}$<br>$L_0$ : Thread lead<br>Note:<br>Up to 40 can be set.</td></tr>
<tr><td>Unit</td><td>Lead/10</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">K20</td><td colspan="2">Incomplete threading portion length calculation coefficient for tap tip</td><td rowspan="4">$\ell = P \times \frac{K20}{10}$<br>P : Tapping pitch<br>$\ell$ : Incomplete thread portion length<br> 

NM211-00273<br>Note:<br>Up to 99 can be set.</td></tr>
<tr><td>Unit</td><td>Pitch/10</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

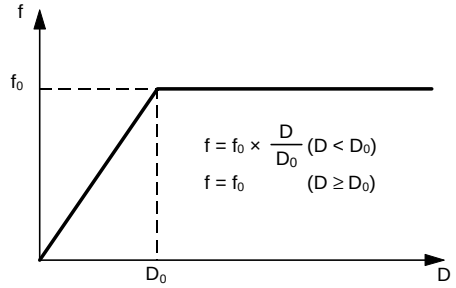
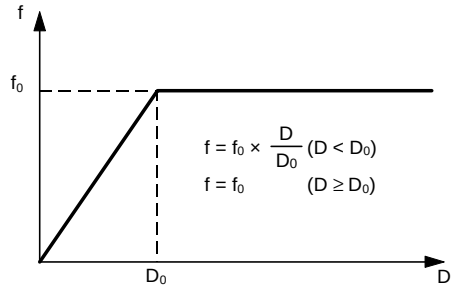
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K21</td><td colspan="2">Tapper elongation calculation coefficient</td><td rowspan="4">$\ell = P \times \frac{K21}{10}$<br>P : Tapping pitch<br>$\ell$ : Tapper elongation<br>  <br><br>NM211-00274<br>Note:<br>Up to 99 can be set.</td></tr>
<tr><td>Unit</td><td>Pitch/10</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K23</td><td colspan="2">Calculation coefficient for axial feedrate of milling line machining (MGV, LCT, RGT, LFT)</td><td rowspan="4">Ratio of axial feedrate to diametral feedrate is set.<br>(Axial feedrate) = (Radial feedrate) × $\frac{K23}{100}$<br>  <br><br>NM211-00275<br>K23 for finish cutting<br>Notes:<br>1. Up to 999 % can be set.<br>2. If 0 is entered, the ratio will be regarded as 100%.<br>3. This parameter is valid only for the tool number scheme.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

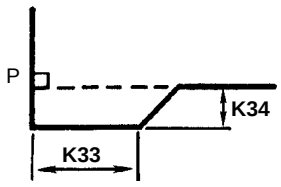
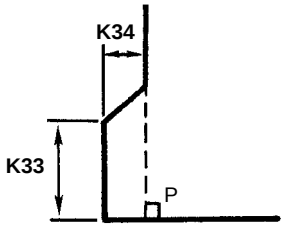
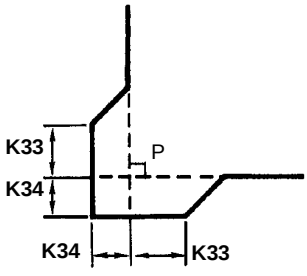
| Address | Meaning | | Description |
|---|---|---|---|
| **K24** | Thread height calculation coefficient for outside diameter, face/rear thread cutting (metric) | | The thread height is calculated using the following calculation expression:<br>$h = P \times \frac{\textbf{K24 to K27}}{10000}$<br>h : Thread height<br>P : Thread pitch |
| | Unit | 0.01% | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K25** | Thread height calculation coefficient for inside diameter thread cutting (metric) | | |
| | Unit | 0.01% | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K26** | Thread height calculation coefficient for outside diameter, face/rear thread cutting (inch) | | |
| | Unit | 0.01% | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K27** | Thread height calculation coefficient for inside diameter thread cutting (inch) | | |
| | Unit | 0.01% | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| | Metric | Inch |
|---|---|---|
| O. D. | **K24** | **K26** |
| Face | **K24** | **K26** |
| Rear | **K24** | **K26** |
| I. D. | **K25** | **K27** |

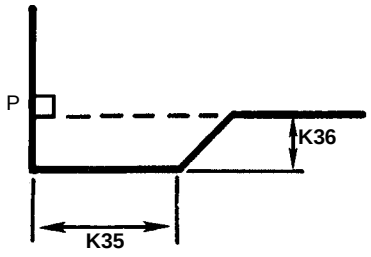
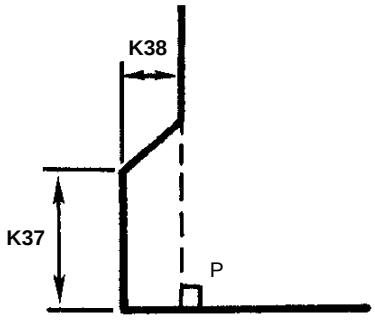
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **K29** | Feedrate calculation reference diameter in mill drilling unit (MDR) | |   f : Feedrate<br>$f_0$ : Data depending on cutting conditions<br>D : Hole diameter<br>$D_0$ : **K29** × α (MDR unit)<br>$D_0$ : **K30** × α (BOR unit)<br>α : 0.1 (for metric specs.) or 0.01 (for inch specs.) |
| | Unit | 0.1 mm or 0.01 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K30** | Feedrate calculation reference diameter in mill boring unit (BOR) | | |
| | Unit | 0.1 mm or 0.01 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K31** | Radial direction feedrate calculation reference diameter for rough cutting in milling line machining unit (MGV, LCT, RGT, LFT) | |   f : Feedrate<br>$f_0$ : Data depending on cutting conditions<br>D : Groove width<br>$D_0$ : **K31** × α<br>α : 0.1 (for metric specs.) or 0.01 (for inch specs.) |
| | Unit | 0.1 mm or 0.01 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

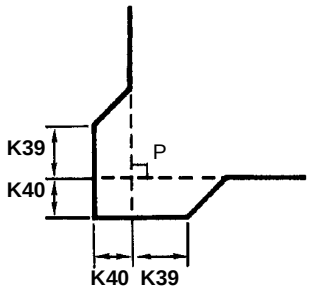
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

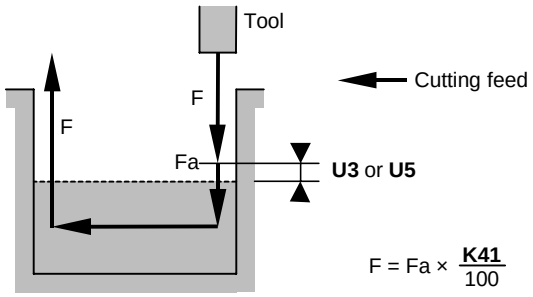
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K32</td><td colspan="2">Radial direction feedrate calculation reference diameter for finish cutting in milling line machining unit (MGV, LCT, RGT, LFT)</td><td rowspan="4">This parameter, the roughness code, etc. determine the finishing feedrate.<br>- If the radial-finishing feedrate is taken as $F_1$, then:<br>$\mathbf{U19} \times \frac{D}{\mathbf{K32} \times \alpha} \times Kf \times Z$ $(D < \mathbf{K32} \times \alpha)$<br>$\mathbf{U19} \times Kf \times Z$ $(D \geq \mathbf{K32} \times \alpha)$<br>- If the axial-finishing feedrate is taken as $F_2$, then:<br>$F_2 = F_1 \times \frac{\mathbf{K23}}{100}$<br>D : Tool diameter<br>α : 0.1 (for metric specs.) or 0.01 (for inch specs.)<br>$K_f$ : Roughness coefficient (Refer to the list below)<br>Z : Number of teeth<br><table><tr><th>Roughness code</th><th>$K_f$</th><th>Roughness code</th><th>$K_f$</th><th>Roughness code</th><th>$K_f$</th></tr><tr><td>∇<br>1</td><td>$K_0 \times 0.8^{-3}$</td><td>∇∇<br>4</td><td>$K_0$</td><td>∇∇∇∇<br>7</td><td>$K_0 \times 0.8^3$</td></tr><tr><td>∇<br>2</td><td>$K_0 \times 0.8^{-2}$</td><td>∇∇∇<br>5</td><td>$K_0 \times 0.8$</td><td>∇∇∇∇<br>8</td><td>$K_0 \times 0.8^4$</td></tr><tr><td>∇∇<br>3</td><td>$K_0 \times 0.8^{-1}$</td><td>∇∇∇<br>6</td><td>$K_0 \times 0.8^2$</td><td>∇∇∇∇<br>9</td><td>$K_0 \times 0.8^5$</td></tr></table>$K_0$=Standard data 0.5<br>(⇨U19, K23)</td></tr>
<tr><td>Unit</td><td>0.1 mm or 0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K33</td><td colspan="2">Polishing margin width for #1 to #3</td><td rowspan="8"><#1><br>  <br><br>NM211-00277<br><#2><br>  <br><br>NM211-00278<br><#3><br>  <br><br>NM211-00279<br>P: Program end point</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K34</td><td colspan="2">Polishing margin depth #1 to #3</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

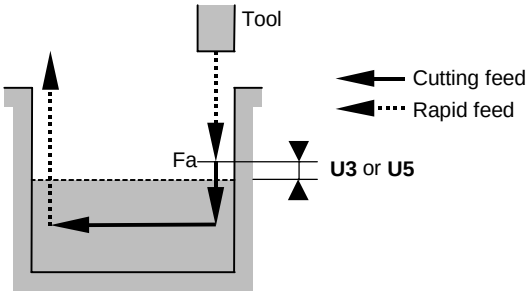
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **K35** | Polishing margin width for #4 | | <#4><br>  <br><br>NM211-00280<br>P: Program end point |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K36** | Polishing margin depth for #4 | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K37** | Polishing margin width for #5 | | <#5><br>  <br><br>NM211-00278<br>P: Program end point |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K38** | Polishing margin depth for #5 | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

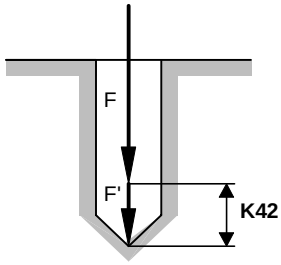
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K39</td><td colspan="2">Polishing margin width for #6</td><td rowspan="8"><#6><br> 

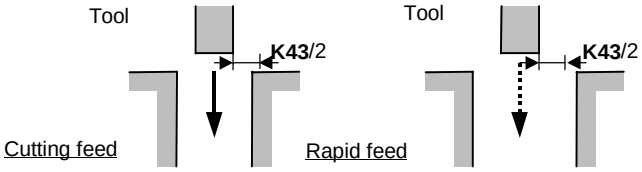
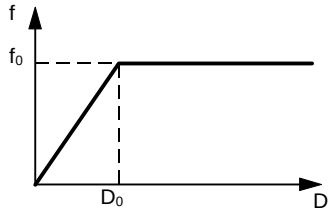
NM211-00279<br>P: Program end point</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K40</td><td colspan="2">Polishing margin depth for #6</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K41</td><td colspan="2">Rate of adjustment of the axial cutting/ relief feedrate during linear milling</td><td rowspan="4">K41 ≠ 0<br> 

Fa : Designated axial feedrate<br>F : Adjusted feedrate (valid for the 2nd cutting operation onward)<br>K41 = 0<br> 

Fa : Designated axial feedrate</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K42</td><td colspan="2">Distance from the ending point of a mill-drilling unit (MDR) where the feedrate is to be modified</td><td rowspan="4"> 

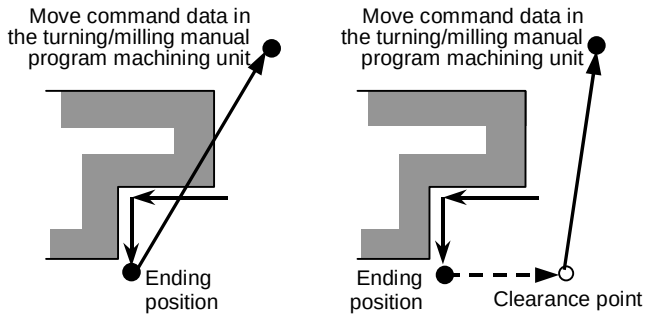
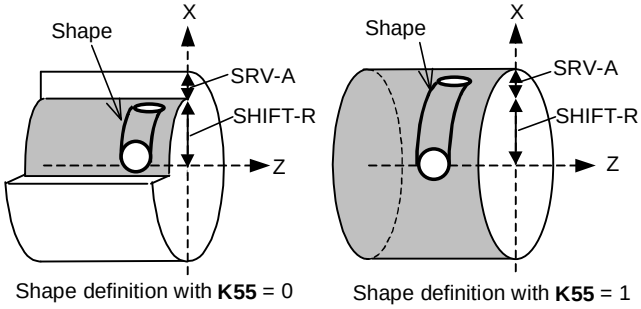
$F' = F \times \frac{K42}{100}$<br>F : Designated feedrate<br>F' : Feedrate at the end of cutting</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K43</td><td colspan="2">Radial clearance for circular milling</td><td rowspan="4">Set the clearance between the pre-hole diameter and tool diameter for determining whether the rapid feed mode or the cutting feed mode is to be used to axially feed the tool for circular milling.<br>If pre-hole diameter ≤ (Tool diameter + K43): Cutting feed<br>If pre-hole diameter > (Tool diameter + K43): Rapid feed<br> 
</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K45</td><td colspan="2">Reference diameter for calculating the circular milling radial feedrate</td><td rowspan="4"> 

$f = f_0 \times \frac{D}{D_0}$ $(D < D_0)$<br>$f = f_0$ $(D \geq D_0)$<br>f : Feedrate<br>$f_0$ : Designated value for the particular cutting conditions<br>D : Hole diameter<br>$D_0$ : K45 × α<br>α : 0.1 if metric, 0.01 if inch</td></tr>
<tr><td>Unit</td><td>0.1 mm or 0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K46</td><td colspan="2">Coefficient for calculating the circular milling axial feedrate</td><td rowspan="4">Set the ratio of the axial feedrate to the radial feedrate.<br>（Axial feedrate）=（Radial feedrate）× K46/100</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **K47** | Selection of position for output of reciprocating rotation M code at milling tapping | | **K47** = 0<br>Dwell after output of the reciprocating rotation M code at the bottom of hole.<br>**K47** = 1<br>Output of the reciprocating rotation M code after dwell at the bottom of hole. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **K49** | Selection of manual feed per revolution or per minute | | This parameter specifies whether manual JOG feed is to be executed in the feed per revolution mode or in the feed per minute mode.<br>If **K49** = 0 : Feed per minute<br>If **K49** = 1 : Feed per revolution |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **K50** | Direction of rotation of the C-axis during C-axial threading with G01.1 | | Select the direction of rotation of the C-axis during C-axial threading based on G01.1.<br>If **K50** = 0 :<br>The C-axis rotates CW (forward).<br>If **K50** = 1 :<br>The C-axis rotates CCW (backward). |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K51</td><td colspan="2">Selection of whether to move the tool past a clearance point immediately before executing move command of the turning/ milling manual program machining unit that follows I. D. machining</td><td rowspan="4">Select whether the tool is to be moved past a clearance point immediately before executing move command of the turning/milling manual program machining unit that follows inside-diameter machining.<br>If K51 = 0 :<br>The tool directly moves from the ending position of I. D. machining, to the position specified by the move command data line on the turning/milling manual program machining unit.<br>If K51 = 1 :<br>The tool moves from the ending position of I. D. machining, through a clearance point, to the position specified by the move command data in the turning/milling manual program machining unit.<br>K51 = 0 K51 = 1<br>  <br><br>Note:<br>This parameter is valid only when the return to the tool change position is set to ‘Invalid’ (0) in the turning/milling manual program machining unit.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K55</td><td colspan="2">Selection of a shape definition method for the Z-C plane in a linear machining unit</td><td rowspan="4">Select a definition method for the shape that is to be programmed on the Z-C plane of a linear machining unit (LINE CTR, LINE RGT, LINE LFT, LINE IN, or LINE OUT).<br>If K55 = 0 :<br>Define the shape on the plane of SHIFT-R. Even if the value of SRV-A is changed, the position of the C-axis for defining the shape to be programmed will not change.<br>If K55 = 1 :<br>Define the shape on the plane of SHIFT-R + SRV-A (conventional method). The position of the C-axis for defining the shape to be programmed changes according to the particular value of SRV-A.<br>  <br></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

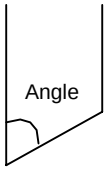
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K57</td><td colspan="2">Method of nose R offsetting during finishing with EIA conversion output</td><td rowspan="4">This parameter specifies whether nose R offsetting is to be executed and whether G41 and G42 are to be added prior to output during finishing.<br>If K57 = 0 :<br>Nose R offsetting is executed and G41/G42 is not added during finishing.<br>If K57 = 1 :<br>Nose R offsetting is not executed and G41/G42 is added during finishing.<br>If K57 = 2 :<br>Nose R offsetting is executed and G41/G42 is added during finishing.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">K58</td><td colspan="2">Language selection</td><td rowspan="4">This parameter specifies whether the first language or the second language is to be used.<br><table><tr><th>Setting</th><th>Language</th><th>Setting</th><th>Language</th></tr><tr><td>0</td><td>English</td><td>9</td><td>Chinese</td></tr><tr><td>1</td><td>Japanese</td><td>10</td><td>Dutch</td></tr><tr><td>2</td><td>German</td><td>11</td><td>Korean</td></tr><tr><td>3</td><td>French</td><td>12</td><td>Portuguese</td></tr><tr><td>4</td><td>Italian</td><td>13</td><td>Danish</td></tr><tr><td>5</td><td>Spanish</td><td>14</td><td>Czech</td></tr><tr><td>6</td><td>Norwegian</td><td>15</td><td>Turkish</td></tr><tr><td>7</td><td>Swedish</td><td>16</td><td>Polish</td></tr><tr><td>8</td><td>Finnish</td><td>17</td><td>Rumanian</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">K60<br>(bit 0)<br>(bit 1)</td><td colspan="2">Data entry for communication with the magazine-side display unit<br>(Serial port)</td><td rowspan="4">Specify the serial port number of the NC unit that is to be used for communication with the magazine-side display unit.<br><table><tr><th>Bit 1</th><th>Bit 0</th><th>Serial port</th></tr><tr><td>0</td><td>0</td><td>COM1</td></tr><tr><td>0</td><td>1</td><td>COM2</td></tr><tr><td>1</td><td>0</td><td>COM3</td></tr><tr><td>1</td><td>1</td><td>COM4</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">K60<br>(bit 2)</td><td colspan="2">Data entry for communication with the magazine-side display unit<br>(Communication setting file)</td><td rowspan="4">Fixed (0)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

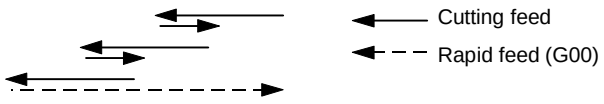
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K60<br>(bit 4)<br>(bit 5)</td><td colspan="2">Data entry for communication with the magazine-side display unit<br>(Type of ID amplifier)</td><td rowspan="4">Specify the type of ID amplifier.<br><table><tr><th>Bit 5</th><th>Bit 4</th><th>Type</th></tr><tr><td>0</td><td>0</td><td>Mazak ID</td></tr><tr><td>0</td><td>1</td><td>Invalid</td></tr><tr><td>1</td><td>0</td><td>Invalid</td></tr><tr><td>1</td><td>1</td><td>Invalid</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">K60<br>(bit 6)<br>(bit 7)</td><td colspan="2">Data entry for communication with the magazine-side display unit<br>(R-register)</td><td rowspan="4">Specify whether the timing of the R-register is to be made valid during tool removal or mounting.<br><table><tr><th>Bit 7</th><th>Bit 6</th><th>Setting</th></tr><tr><td>0</td><td>0</td><td>R-register is not used</td></tr><tr><td>0</td><td>1</td><td>R-register is used (fixed)</td></tr><tr><td>1</td><td>0</td><td>Invalid</td></tr><tr><td>1</td><td>1</td><td>Invalid</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">K65</td><td colspan="2">Selection of a cylindrical interpolation rotational axis for cylindrical interpolation plane selection</td><td rowspan="4">This parameter specifies which axis is to be set as the cylindrical interpolation rotational axis for selecting a cylindrical interpolation plane.<br><table><tr><th>Setting</th><th>Meaning</th></tr><tr><td>0</td><td>Neither the three fundamental axes nor their parallel axes</td></tr><tr><td>1</td><td>X-axis among the three fundamental axes</td></tr><tr><td>2</td><td>Y-axis among the three fundamental axes</td></tr><tr><td>3</td><td>Z-axis among the three fundamental axes</td></tr><tr><td>5*</td><td>Axis parallel to the X-axis</td></tr><tr><td>6*</td><td>Axis parallel to the Y-axis</td></tr><tr><td>7</td><td>Axis parallel to the Z-axis</td></tr></table>* Only either one<br>During plane selection in the cylindrical interpolation mode, reference is made to the setting of this parameter.<br>If the setting is 5, only G18 can be used.<br>If the setting is 6, only G19 can be used.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K67</td><td colspan="2">Angle of the tool nose durig the G76 mode</td><td rowspan="4">If, during the composite-type fixed cycle G76 mode, a tool nose angle has not been specified in the program, the setting of this parameter will become the angle of the tool nose.<br>  <br><br>The setting must be either 0, 29, 30, 55, 60 or 80.</td></tr>
<tr><td>Unit</td><td>Degree</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">K68</td><td colspan="2">Number of common variables between turrets (#100 onward)</td><td rowspan="8">Set the number of common variables which can be read and written between the turrets. Variables from #100 to #149 become the subject of processing of K68 (variables from #500 to #531 become the subject of processing of K69).<br>Example: 1: If 10 is set in K68<br>#100 to #109 : Common variables that are valid for both turrets<br>#110 to #149 : Common variables that are valid only for one turret<br>Example 2: If 10 is set in K69<br>#500 to #509 : Common variables that are valid for both turrets<br>#510 to #531 : Common variables that are valid only for one turret<br>Note:<br>The maximum permissible value will be used if the designated value is larger than that one.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">K69</td><td colspan="2">Number of common variables between turrets (#500 onward)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">K70</td><td colspan="2">Return speed overriding during a synchronous tapping</td><td rowspan="4">Feedrate overriding during removal of synchronous tapping tool is set by this parameter.<br>This parameter is valid only for EIA/ISO programs.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

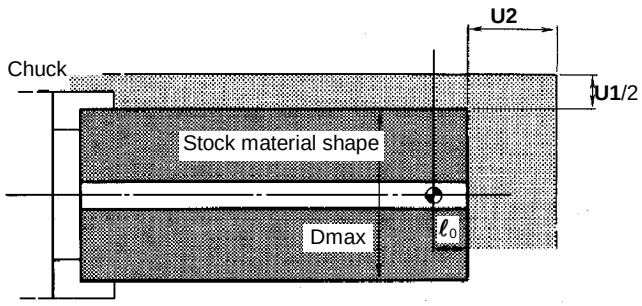
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">K72</td><td colspan="2">Tool registration quantity pattern on the TOOL LIFE display</td><td rowspan="4">This parameter specifies a combination pattern of the number of groups and the registration quantity on the TOOL LIFE display.<br><table><tr><th>Setting</th><th>Number of groups</th><th>Registration quantity</th></tr><tr><td>0</td><td>16</td><td>16</td></tr><tr><td>1</td><td>32</td><td>8</td></tr><tr><td>2</td><td>64</td><td>4</td></tr><tr><td>3</td><td>128</td><td>2</td></tr></table>Note:<br>After the setting of this parameter has been changed, TOOL LIFE display data needs to be initialized in the data-initializing window.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">K74</td><td colspan="2">Number of cutting edges of a FLASH-tool for milling<br>(Only for a milling tool not specified in the TOOL FILE display)</td><td rowspan="4">Specify the number of cutting edges of the FLASH-tool to be used as a milling tool other than the end mills, face mills, chamfering cutters, or ball end mills to be registered in the TOOL FILE display.<br>The number of cutting edges is 2 if the setting of parameter K74 is ‘0’.<br>The tip to be used for the milling tool is identified from the relationship between the tip position data in the TOOL DATA display and the number of cutting edges specified in K74<br>The setting range is from 0 to 255.</td></tr>
<tr><td>Unit</td><td>–</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">K75</td><td colspan="2">Selection about planetary tapping chip ejection</td><td rowspan="4">Select whether the chips arising from planetary tapping are to be ejected.<br>0: Chips not to be ejected.<br>1: Chips to be ejected.</td></tr>
<tr><td>Unit</td><td>–</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">K76</td><td colspan="2">Reduction ratio for the G00-based relief rate during a very-deep-hole drilling cycle</td><td rowspan="4">Set the reduction ratio for the G00-based relief rate during the #4 or [#4] cycle (very-deep-hole drilling) in a DRL, MDR unit.<br> 
</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

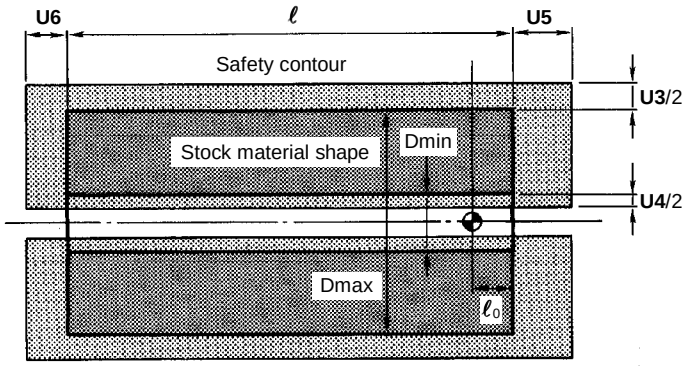
| Address | Meaning | | Description |
|---|---|---|---|
| **K77** | Dwell at the hole bottom during a DRL or MDR unit | | Set the number of revolutions of the spindle or the tool during dwell time at the bottom of a hole when the #0 - #4 non-through hole drilling cycle is selected in DRL or MDR unit. |
| | Unit | Revolutions | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **K81** to **K88** | Macro call G-code and corresponding macroprogram number | | Set the G-code to be used for macro call and the macroprogram number corresponding to the macro call G-code.<br>Set G-code and macroprogram number for the data item “CODE” and “NUM.” respectively.<br>**Example:**<br>CODE NUM.<br>K81 100 1234<br>⋮ ⋮ ⋮<br>If G100 ; is set, the macroprogram 1234 will be called. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **K89** to **K93** | Macro call M-code and corresponding macroprogram number | | Set the M-code to be used for macro call and the macroprogram number corresponding to the macro call M-code.<br>Set M-code and macroprogram number for the data item “CODE” and “NUM.” respectively.<br>**Example:**<br>CODE NUM.<br>K89 101 1235<br>⋮ ⋮ ⋮<br>If M101 ; is set, the macroprogram 1235 will be called. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **K94** **K95** **K96** | Macro call S, T or B-code and corresponding macroprogram number | | Set the S, T or B-code to be used for macro call and the macroprogram number corresponding to the macro call S, T or B-code.<br>Set S, T or B-code and macroprogram number for the data item “CODE” and “NUM.” respectively.<br>**Example:**<br>CODE NUM.<br>K94 102 1236<br>⋮ ⋮ ⋮<br>If S102 ; is set, the macroprogram 1236 will be called. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |

## 3-4 PARAMETER (USER, CUTTING U)

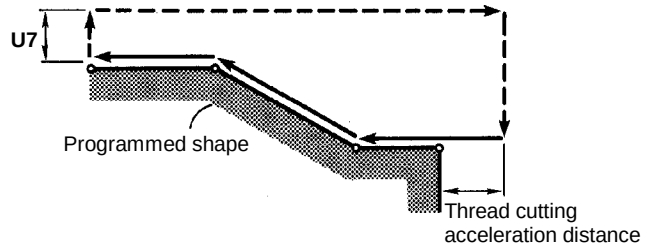
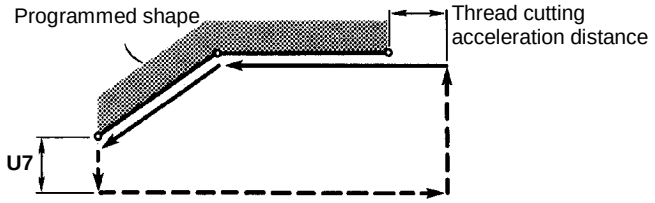
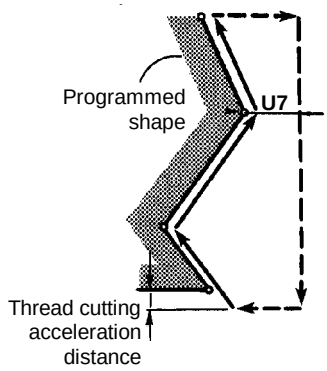
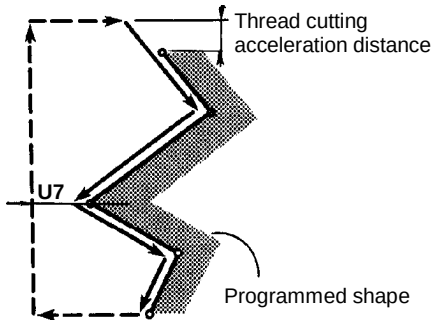
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U1** | Tool turning clearance (diametral value) in X-axis | | Tool turning clearance is required to prevent interference between the tool and stock material during tool change in automatic operation.<br>  <br>NM211-00220<br>Dmax: Stock material maximum outside diameter<br>$\ell_0$: Stock material edge projection length |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U2** | Tool turning clearance (diametral value) in Z-axis | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

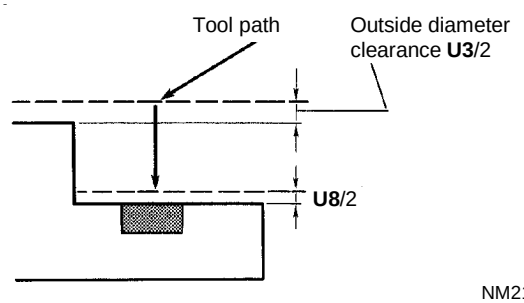
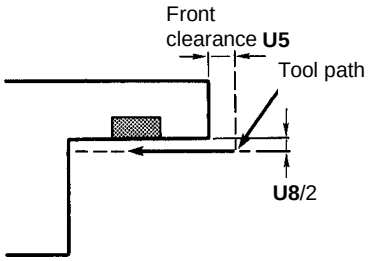
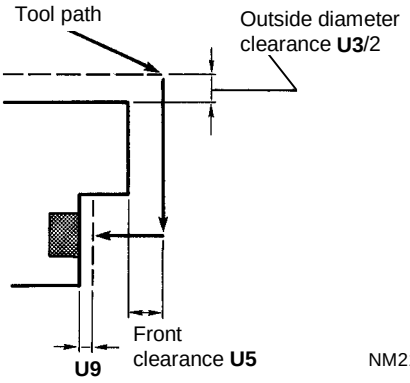
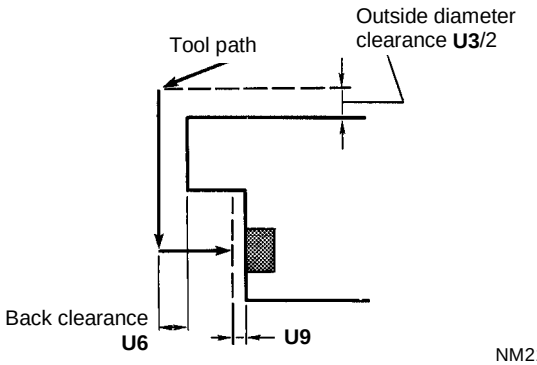
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U3** | Safety contour clearance<br>— Outside diameter clearance (diametral value) | | Safety contour clearance is provided for outside of the stock material shape specified by common data in program.<br>Tool approach and escape paths for each unit will be automatically determined according to set data (outside diameter, inside diameter, front clearance, back clearance) for parameters from **U3** to **U6**.<br>  <br><br>NM211-00221<br>Dmax: Stock material maximum outside diameter<br>Dmin: Stock material minimum inside diameter<br>$\ell_0$: Stock material edge projection length<br>$\ell$: Stock material length |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U4** | Safety contour clearance<br>— Inside diameter clearance (diametral value) | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U5** | Safety contour clearance<br>— Front clearance | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U6** | Safety contour clearance<br>— Back clearance | | |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

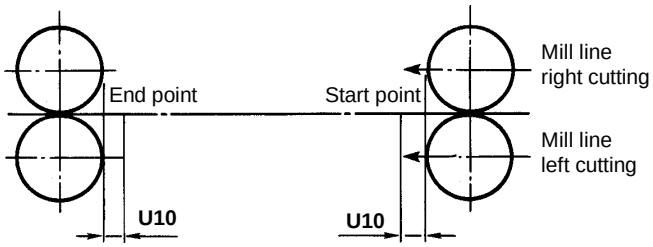
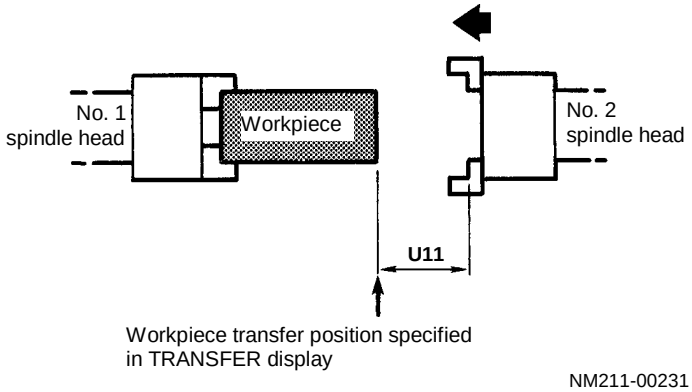
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U7** | Thread cutting clearance (radial value) | | Thread cutting clearance is provided to specify tool return distance for each cycle in thread cutting unit (THR).<br>Thread cutting clearance will be added to the highest portion of thread and repeating path will be determined automatically.<br><OUT><br>  <br><br>NM211-00222<br><IN><br>  <br><br>NM211-00223<br><FCE><br>  <br><br>NM211-00224<br><BAK><br>  <br><br>NM211-00225 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U8</td><td colspan="2">Groove cutting clearance (diametral value) in X-axis</td><td rowspan="7">Groove cutting clearance is provided at machining start portion in groove cutting unit (GRV).<br><OUT><br>  <br><br>NM211-00226<br><IN><br>  <br><br>NM211-00227<br><FCE><br>  <br><br>NM211-00228<br><BAK><br>  <br><br>NM211-00229</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U9</td><td colspan="2">Groove cutting clearance (diametral value) in Z-axis</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

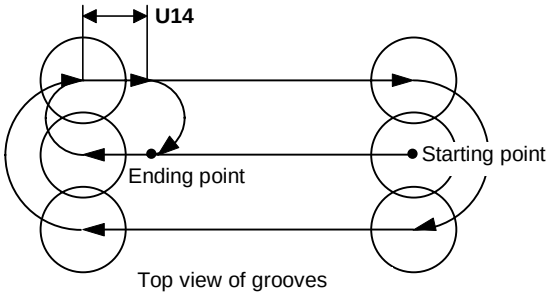
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U10** | Milling line right/left cutting clearance | | Milling line right/left cutting clearance is provided to specify tool approach point and escape point in milling line right and left cutting unit (LFT, RGT).<br>  <br><br>NM211-00230 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U11** | Workpiece transfer clearance | | Workpiece transfer clearance is provided to specify workpiece transfer position in workpiece transfer unit (TRS).<br>**Example:**<br>Workpiece transferred from No. 1 spindle head to No. 2 spindle head.<br>  <br><br>NM211-00231<br>No. 2 spindle head traverse by rapid feedrate from transfer position to position distant by clearance distance **U11**, and then transfer operation initiated. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | (⇨**U26**, **U27**, **U50**) |

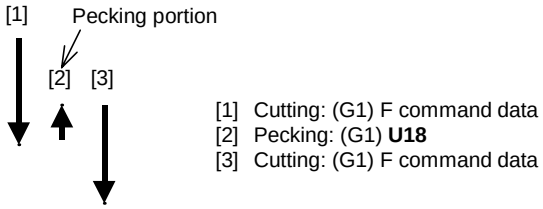
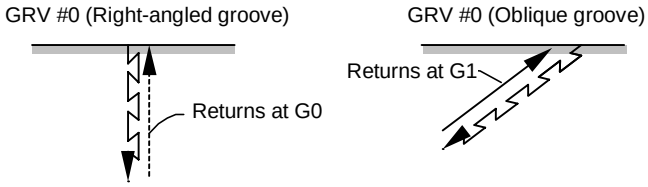
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U12</td><td colspan="2">Amount of edge clearance after EDG roughing</td><td rowspan="4">After EDG unit roughing, this parameter works instead of safety contour clearance FCE parameter U5. If, however, U12 is zero, then U5 is used.</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U13</td><td colspan="2">Radial finishing allowance for Y-axis mill-grooving unit (MGV)</td><td rowspan="4">The radial finishing allowance of arc cutting in the MAZATROL program mill-grooving unit (MGV) of Y-axial machining is set as follows:<br>For the data<br><pre>UNo. UNIT    #  GRV-WID  DEPTH  FINISH
   MGV OUT [1]–[2]                  [3]

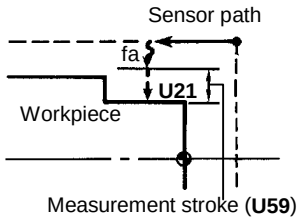
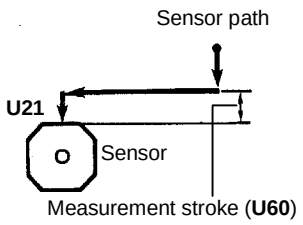
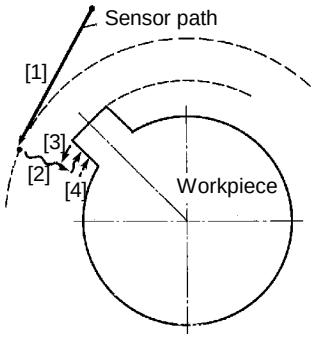
     [1] #2 :  CW cutting
         #3 :  CCW cutting
     [2] 2  :  Radial and axial finishing
     [3] Axial finishing allowance</pre>the radial finishing allowance becomes equal to [(Finishing allowance [3]) × (this parameter/100)].</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U14</td><td colspan="2">Amount of overlapping for Y-axis mill-grooving unit (MGV)</td><td rowspan="4">The amount of radial overlapping for arc cutting in the MAZATROL program mill-grooving unit (MGV) of Y-axis machining is set as follows:<br><br>For the data<br><pre>UNo. UNIT    #   GRV-WID  DEPTH
   MGV OUT  [1]–[2]

     [1] #2 :  CW cutting
         #3 :  CCW cutting</pre>the amount of radial overlapping is set so that the tool moves as shown below.<br>  <br><br>Top view of grooves</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

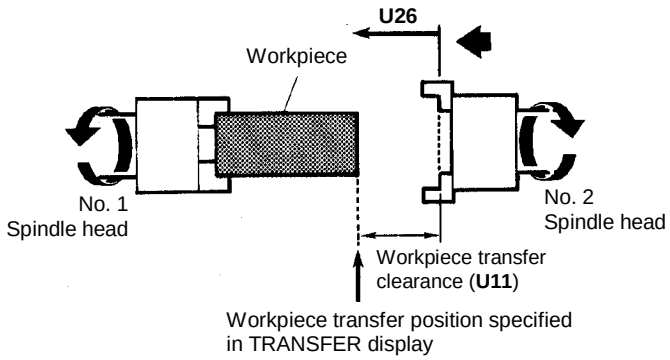
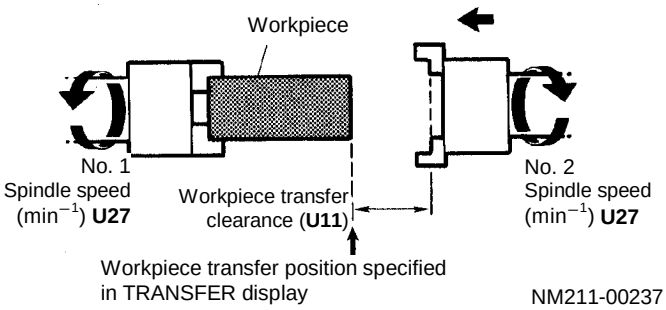
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U18</td><td colspan="2">Return speed at pecking portion in groove cutting unit (GRV) and drilling unit (DRL, MDR)</td><td>Pecking speed<br>  <br><br>[1] Cutting: (G1) F command data<br>[2] Pecking: (G1) U18<br>[3] Cutting: (G1) F command data<br><br>When executing groove cutting with grooving pattern #0 (only for oblique groove) the tool returns from the groove bottom also at the “G1” feedrate determined by this parameter.<br>  <br><br>Note:<br>In drilling unit (DRL, MDR), U18 setting will be used only for #2 [#2] type.</td></tr>
<tr><td>Unit</td><td>0.001 mm/rev or<br>0.0001 inches/rev</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U19</td><td colspan="2">Feedrate specification reference speed for finish cutting in milling line machining unit (MGV, LCT, RGT, LFT)</td><td>This parameter, the roughness code, etc. determine the finish feedrate.<br>If the radial-finishing feedrate is taken as $F_1$, then:<br>$F_1 \begin{cases} \textbf{U19} \times \dfrac{D}{\textbf{K32} \times \alpha} \times Kf \times Z & (D < \textbf{K32} \times \alpha) \\ \textbf{U19} \times Kf \times Z & (D \geq \textbf{K32} \times \alpha) \end{cases}$<br>If the axial-finishing feedrate is taken as $F_2$, then:<br>$F_2 = F_1 \times \dfrac{\textbf{K23}}{100}$<br>D : Tool diameter<br>α : 0.1 (for metric specs.) or<br>0.01 (for inch specs.)<br>$K_f$ : Roughness coefficient (Refer to the list below.)<br>Z : Number of teeth<br><table><tr><th>Roughness code</th><th>$K_f$</th><th>Roughness code</th><th>$K_f$</th><th>Roughness code</th><th>$K_f$</th></tr><tr><td>∇<br>1</td><td>$K_0 \times 0.8^{-3}$</td><td>∇∇<br>4</td><td>$K_0$</td><td>∇∇∇∇<br>7</td><td>$K_0 \times 0.8^3$</td></tr><tr><td>∇<br>2</td><td>$K_0 \times 0.8^{-2}$</td><td>∇∇∇<br>5</td><td>$K_0 \times 0.8$</td><td>∇∇∇∇<br>8</td><td>$K_0 \times 0.8^4$</td></tr><tr><td>∇∇<br>3</td><td>$K_0 \times 0.8^{-1}$</td><td>∇∇∇<br>6</td><td>$K_0 \times 0.8^2$</td><td>∇∇∇∇<br>9</td><td>$K_0 \times 0.8^5$</td></tr></table>$K_0$=Standard data 0.5<br><br>(⇨K23, K32)</td></tr>
<tr><td>Unit</td><td>0.001 mm/rev or<br>0.0001 inches/rev</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

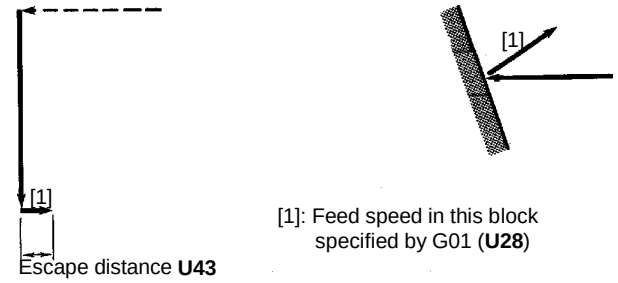
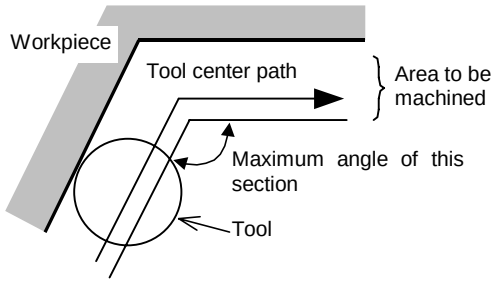
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U21** | Measurement skip feedrate (X-axis, Z-axis) | | (1) Workpiece measurement<br>  <br><br>fa: Measurement approach speed (**U22**)<br>NM211-00233<br>(2) Tool tip measurement<br>  <br><br>NM211-00234<br>(⇨**U22**, **U59**, **U60**) |
| | Unit | mm/min or 0.1 inches/min | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U22** | Measurement approach speed (X-axis, Z-axis) | | Refer to (1) of **U21**. |
| | Unit | mm/min or 0.1 inches/min | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U23** | Measurement skip speed (C-axis) | |  <br><br>[1], [3] : Traverse speed<br>[2] : Measurement approach speed (**U24**)<br>[4] : **U23**<br>NM211-00235<br>(⇨**U24**) |
| | Unit | mm/min or 0.1 inches/min | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U24** | Measurement approach speed (C-axis) | | Refer to **U23**. |
| | Unit | mm/min or 0.1 inches/min | |
| | Effective condition | Instant | |
| | Applicable program | M | |

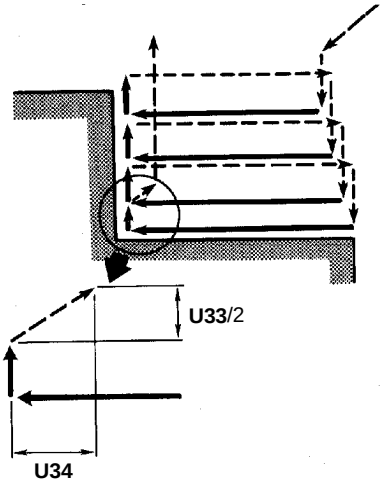
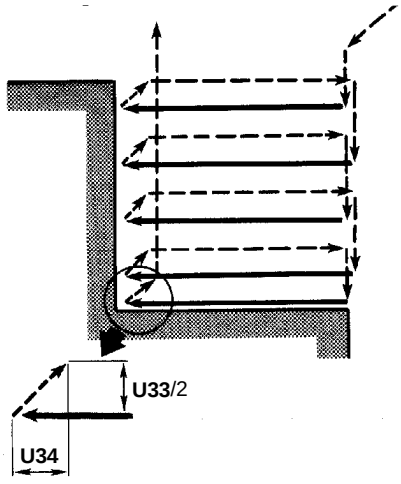
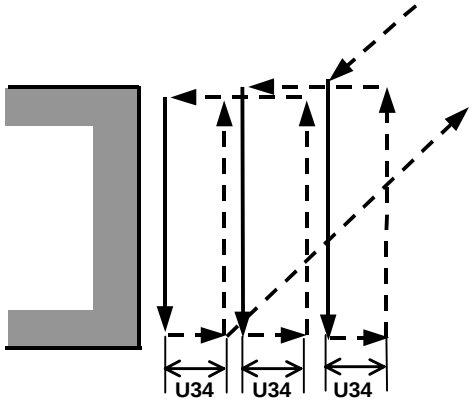
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U25</td><td colspan="2">Approaching speed for TPS function</td><td rowspan="4">Set a speed at which the tool approaches for the TPS function (tool nose position memory function) prior to the start of cutting feed.</td></tr>
<tr><td>Unit</td><td>mm/min or<br>0.1 inches/min</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U26</td><td colspan="2">Workpiece pressing speed in workpiece transfer unit (TRS)</td><td rowspan="4">Example:<br>Workpiece transferred from No. 1 spindle head to No. 2 spindle head<br>  <br><br>NM211-00236<br>Note:<br>Set this parameter equal to or as close as possible to its standard value. Excessive or insufficient setting may cause a contact error.</td></tr>
<tr><td>Unit</td><td>mm/min or<br>0.1 inches/min</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U27</td><td colspan="2">Revolution number (min$^{-1}$) of two spindles in workpiece transfer while the spindles are rotating in workpiece transfer unit (TRS)</td><td rowspan="4">Example:<br>Workpiece transferred from No. 1 spindle head to No. 2 spindle head<br>  <br><br>NM211-00237</td></tr>
<tr><td>Unit</td><td>min$^{-1}$ (rpm)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

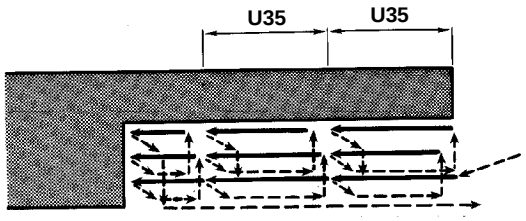
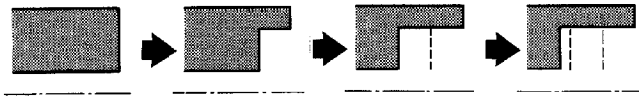
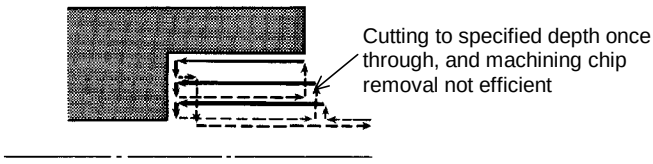
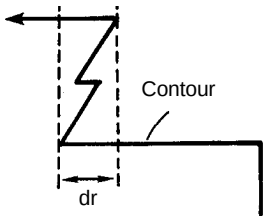
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U28</td><td colspan="2">Feedrate for escape by short distance</td><td rowspan="4">For escape by very short distance, G01 feed speed will be faster than G00 to complete the operation. (If G00 is used, smoothing 0 detection will be made at the end position.)<br>Therefore, for escape very short distance, use G01 command, and set the feed speed of this command as parameter.<br>Example:<br>Escape in finish cutting of EDG unit<br>Escape in rough cutting of BAR unit<br>  <br><br>[1]: Feed speed in this block specified by G01 (U28)<br>NM211-00238<br>(⇨U33, U34, U43)</td></tr>
<tr><td>Unit</td><td>mm/min or<br>0.1 inches/min</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U29</td><td colspan="2">Maximum angle for automatic corner overriding</td><td rowspan="4">Designate the maximum angle for automatic corner overriding.<br>  <br></td></tr>
<tr><td>Unit</td><td>Degree</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

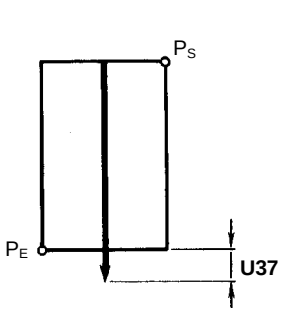
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

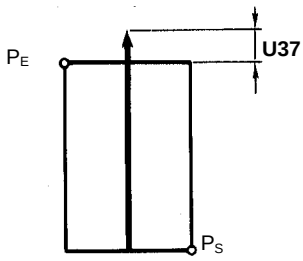
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U33</td><td colspan="2">Return distance (diametral value) in X-axis at wall during rough cutting in bar cutting unit (BAR) or in corner machining unit (CNR)</td><td rowspan="7">Example 1: Standard type cutting<br>Prior to cutting up along the wall in the end of final cycle, escape will be made by specified distance.<br>  <br><br>NM211-00239<br>Example 2: High speed rough cutting<br>Escape will be made by U33 and U34 specified distance during return after reaching the wall.<br>  <br><br>NM211-00240<br>Example 3: In the rough-cutting cycle (G71, G72) of the EIA program<br>The tool escapes through the specified distance after cutting.<br>  <br></td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U34</td><td colspan="2">Return distance (diametral value) in Z-axis at wall during rough cutting in bar cutting unit (BAR) or in corner machining unit (CNR) /<br>Return distance after cutting in the rough-cutting cycle (G71, G72)</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

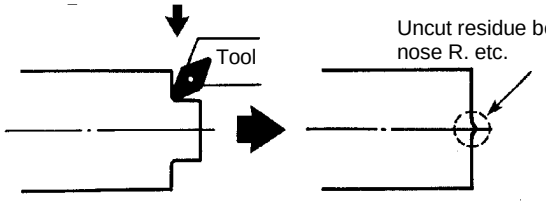
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

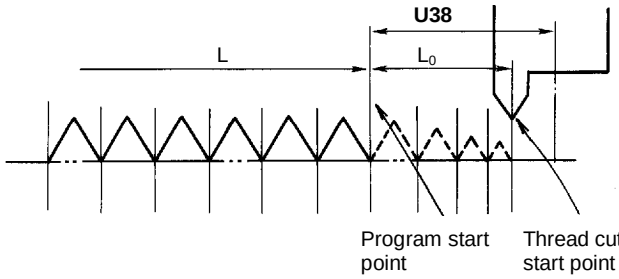
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U35</td><td colspan="2">Cut depth per cycle for machining inside diameter in bar machining unit (BAR)</td><td rowspan="4">Inside diameter enlarging cycle<br>  <br><br>NM211-00241<br>Cutting is promoted gradually from the edge, and machining chip removal efficient.<br>  <br>cf. Standard inside diameter cutting<br>  <br><br>NM211-00242</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U36</td><td colspan="2">Reverse feed tolerance for contour machining</td><td rowspan="4">Example:<br>Outside diameter machining in normal (– Z-axis direction)<br>  <br><br>dr: Reverse feed contour data<br>NM211-00243<br>dr ≤ U36.....No alarm<br>dr > U36.....Alarm</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U37</td><td colspan="2">Overtravelling in X-axis direction in edge machining unit (EDG)</td><td rowspan="4"> 

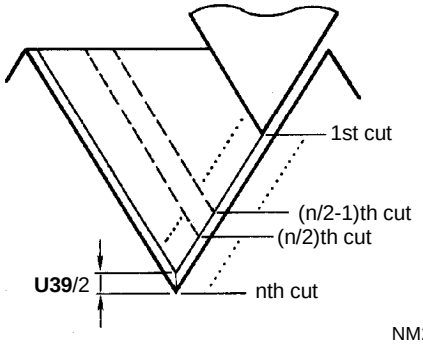
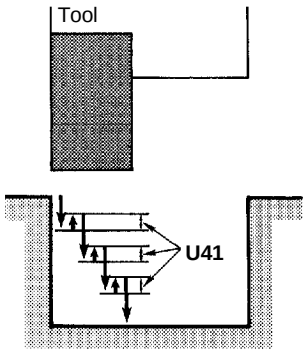
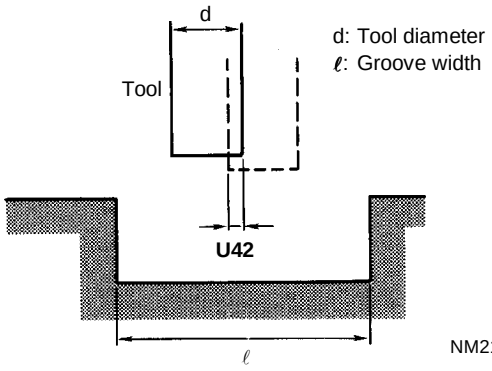
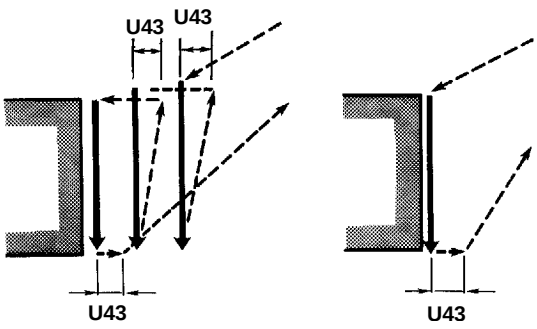


$P_S$: Start point<br>$P_E$: End point<br>NM211-00244<br><br>Note:<br>By setting an adequate value for U37, uncut residue will not be produced in edge machining.<br> 

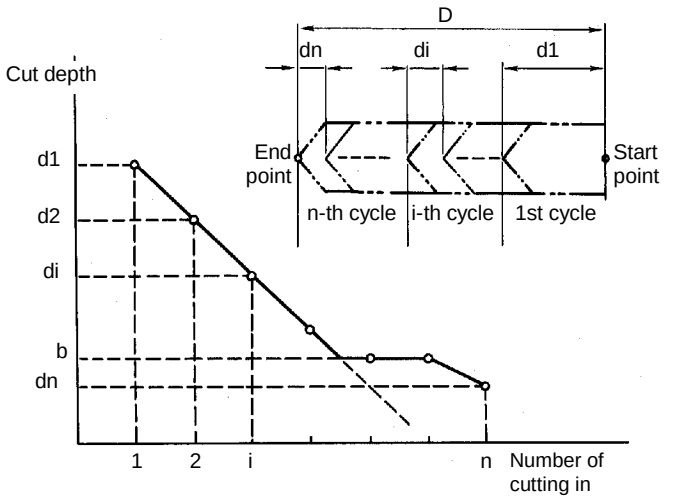
NM211-00245</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U38</td><td colspan="2">Acceleration distance clamp value for thread cutting unit (THR)</td><td rowspan="4"> 

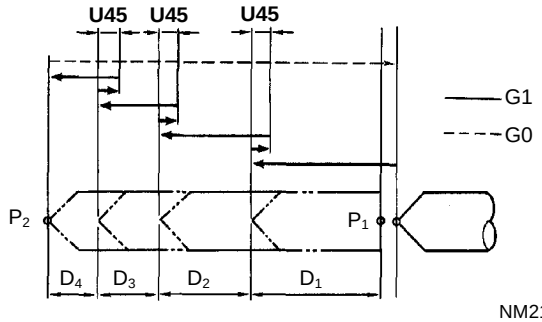
NM211-00246<br><br>L : Effective thread length<br>Lo: Acceleration distance<br><br>If $L_0$>>U38, alarm will be caused.<br>If, however, P1 (bit 3) = 0, alarm will not be caused.<br><br>(⇨P1 (Bit 3))</td></tr>
<tr><td>Unit</td><td>Lead/10</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U39** | Cut depth (diametral value) for final cut in thread cutting unit (THR)<br>Cut depth (diametral value) for final cut in composite type thread cutting cycle G76 | |  <br>NM211-00247 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **U41** | Pecking return distance in groove cutting unit (GRV) | |  <br>NM211-00248 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **U42** | Overlap distance for machining wide groove in groove cutting unit (GRV) | |  <br>NM211-00249 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U43** | Escape value after machining in edge machining unit (EDG) | | <Rough cutting> <Finish cutting><br>  <br>NM211-00250 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

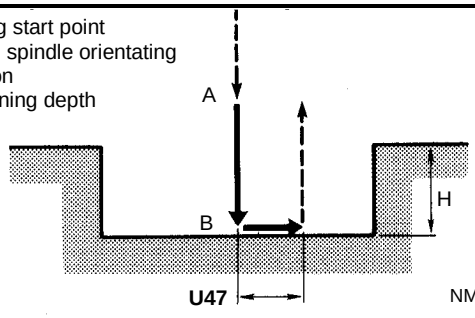
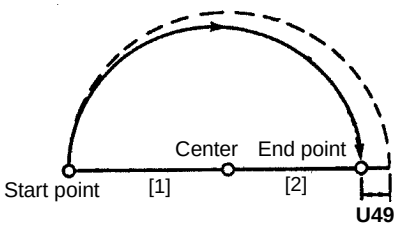
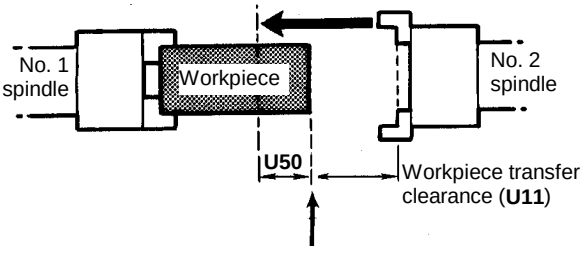
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U44</td><td colspan="2">Drilling depth decrement in drilling unit (DRL, MDR)</td><td rowspan="4"> 

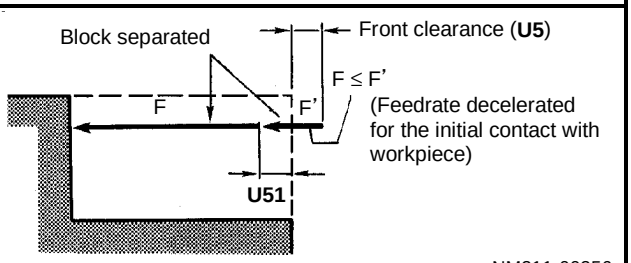
NM211-00251<br>D : Drilling depth<br>d1 : Cut depth in 1st cycle<br>di : Cut depth in i-th cycle<br>d1 – U44 × (i – 1) (di ≥ b)<br>b (di < b)<br>b : Drilling depth clamping value (U46)<br>(⇨U46)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U45</td><td colspan="2">Pecking return distance in drilling unit (DRL, MDR)</td><td rowspan="4"> 

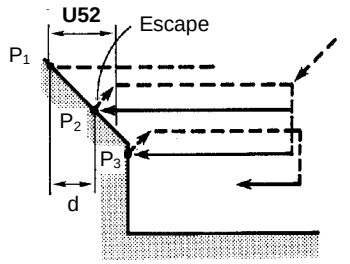
NM211-00252<br>P1: Start point<br>P2: End point<br>Dn (n=1 to 4)=Cut depth</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">U46</td><td colspan="2">Drilling cut depth clamp value in drilling unit (DRL, MDR)</td><td rowspan="4">Minimum drilling cut depth is set.<br><br>(⇨U44)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

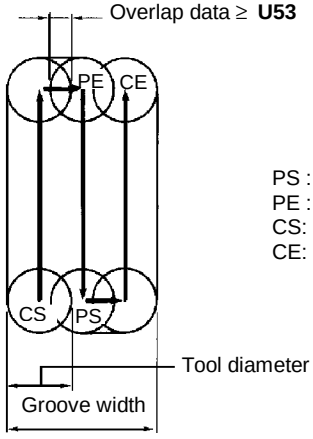
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

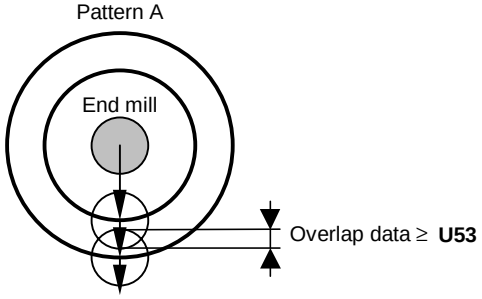
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U47</td><td colspan="2">Escape value after milling spindle orientating at hole button in boring unit (BOR)</td><td rowspan="4">A: Cutting start point<br>B: Milling spindle orientating position<br>H: Machining depth<br>  <br><br>NM211-00252<br>Note:<br>On machines without milling spindle orienting function, always set 0.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U48</td><td colspan="2">Distance of deceleration for automatic corner overriding</td><td rowspan="4">Set the area where automatic corner overriding is to be activated.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">U49</td><td colspan="2">Tolerance for radial value difference at start and end points in arc command</td><td rowspan="4">  <br><br>NM211-00254<br>[1]: Start point radius<br>[2]: End point radius</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">U50</td><td colspan="2">Workpiece pressing distance in workpiece transfer unit (TRS)</td><td rowspan="4">Example:<br>Workpiece transferred from No. 1 spindle to No. 2 spindle<br>  <br><br>Workpiece transfer position specified in TRANSFER display<br>NM211-00255</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U51</td><td colspan="2">Deceleration clearance at start of rough cutting in bar machining unit (BAR) and copy machining unit (CPY)</td><td rowspan="4"> 

NM211-00256<br>Note:<br>Using this parameter will reduce load in the initial contact between the tool and workpiece.<br>(⇨K13)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U52</td><td colspan="2">Tolerance for escape in high speed rough cutting cycle of bar machining unit (BAR)</td><td rowspan="4"> 

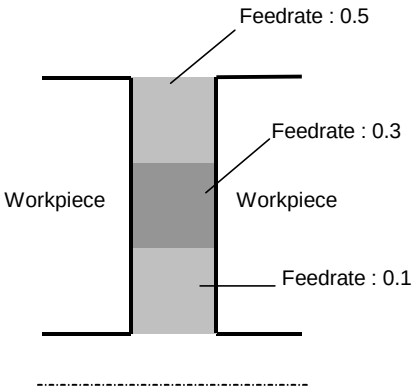
d : Distance in cutting direction between $P_1$ and $P_2$<br>NM211-00257<br>If U52 ≥ d, tool eacape from the workpiece.<br>If U52 < d, tool doesn't escape from the workpiece.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U53</td><td colspan="2">Minimum overlap distance for mill-grooving unit (MGV) and circular milling unit (CIR)</td><td rowspan="4"><Mill-grooving unit><br> 

PS : Programmed start point<br>PE : Programmed end point<br>CS: Actual cutting start point<br>CE: Actual cutting end point<br>NM211-00257<br><Circular milling unit><br> 
</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

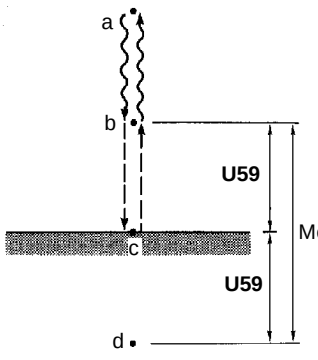
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U54</td><td colspan="2">Spindle revolution clamp value in cutting off cycle (GRV)</td><td rowspan="4">If 0 or 1 is set up in U56: T32 mode<br>This value will be used as the spindle revolution clamp value in cutting off cycle (GRV #4/#5).<br><br>If 2 or more is set up in U56: New mode<br>Immediately before the cutting off area (*) is reached during the cutting off cycle, this value will be used as the spindle revolution clamp value. Within the cutting off area, however, machining will be executed at the speed corresponding to this value.<br><br>*: Cutting off area = (Starting position X – Ending position X) × K8/100</td></tr>
<tr><td>Unit</td><td>$min^{-1}$ (rpm)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U55</td><td colspan="2">Number of times of finishing when #0 (standard pattern) is selected in threading unit</td><td rowspan="4">During finishing that uses #0 (standard pattern) of a threading unit, finishing is executed the number of times that has been set in parameter U55 with the depth of U39/U55.<br><br>U55 = 0 or 1<br>Then the finishing is executed one time with the depth of U39.<br><br>U55 ≥ 2<br>The finishing is repeated the number of times determined by U55 with the depth of U39/U55.<br><br>Notes:<br>1. Parameter U55 is valid only for #0 or [#0]. It is not valid for #1, [#1], #2 or [#2].<br>2. Parameter U55 is not valid if U39 = 0.<br>3. The refinishing of threading is executed once as before.</td></tr>
<tr><td>Unit</td><td>Times</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

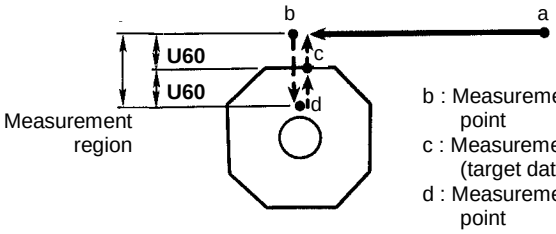
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

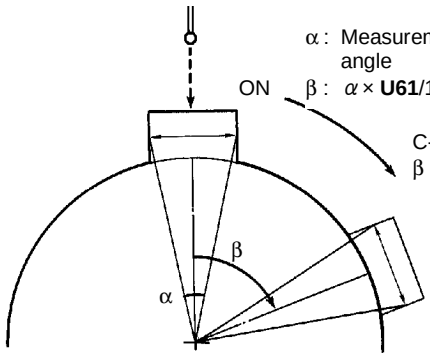
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U56</td><td colspan="2">Number of times that the feedrate is to be reduced during the #4 and #5 cutting-off cycles of a grooving unit</td><td rowspan="4">The staring feed value for cutting-off is a feed value that has been designated in unit data, and the ending feed value for cutting-off is a feed value that has been designated in sequence data. The feedrate from the start of machining to the end is reduced in steps according to the number of times that has been designated here.<br>Example:<br>Feedrate set at “R-FEED” item in unit data = 0.5<br>Feedrate set at “ROUGH” item in sequence data = 0.1<br>U56: 3<br> 

<br>Note:<br>When 0 or 1 is set for U56, the feedrate is unchanged.</td></tr>
<tr><td>Unit</td><td>Times</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U57</td><td colspan="2">Specification of measuring tolerance (lower limit)</td><td rowspan="4">(1) Tool compensation will be made in cases below.<br>$\frac{a_1 - a_2}{100} \times$ U58 $\geq$ Compensation data $\geq \frac{a_1 - a_2}{100} \times$ U57<br>$-\frac{a_1 - a_2}{100} \times$ U57 $\geq$ Compensation data $\geq -\frac{a_1 - a_2}{100} \times$ U58<br>(2) Tool compensation will not be made in cases below.<br>$\frac{a_1 - a_2}{100} \times$ U57 > Compensation data > $-\frac{a_1 - a_2}{100} \times$ U57<br>(3) Alarm will be caused in cases below.<br>Compensation data > $\frac{a_1 - a_2}{100} \times$ U58<br>$-\frac{a_1 - a_2}{100} \times$ U58 > Compensation data<br>where $a_1$ = Tolerance upper limit<br>$a_2$ = Tolerance lower limit (Specified in program)<br>Notes:<br>1. U57 and U58 are not used in tool tip measurement.<br>2. Up to 100 % can be set.</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">U58</td><td colspan="2">Specification of measuring tolerance (upper-limit)</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

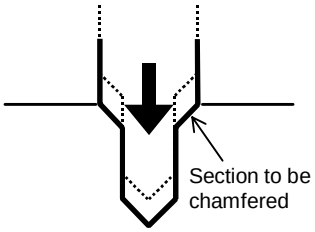
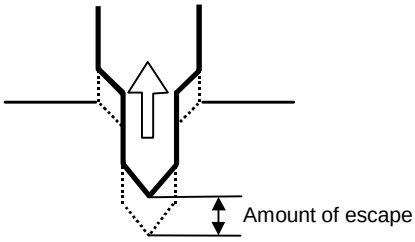
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U59</td><td colspan="2">Measurement stroke for workpiece measurement</td><td rowspan="4"> 

a : Approach point<br>b : Measurement start point<br>c : Measurement point (target data)<br>d : Measurement end point<br>NM211-00259</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U60</td><td colspan="2">Measurement stroke for tool nose measurement</td><td rowspan="4"> 

b : Measurement start point<br>c : Measurement point (target data)<br>d : Measurement end point<br>NM211-00260</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U61</td><td colspan="2">Coefficient to determine rotation angle when retrying measurement in C offset measurement unit (MES-COF)</td><td rowspan="4">During approach operation to measurement start point, if touch sensor is actuated, the C-axis will rotate by angle determined by the measurement object shape angle and setting value U61.<br>Example:<br>CW programmed as measurement direction<br> 

NM211-00261</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U62** | Feed override for the section that is to be chamfered for planetary tapping cycle | | Set the feed override for the section that is to be chamfered in the planetary tapping cycle.<br>Chamfering feed = Feed of tapping tool sequence × **U62**/100<br>  |
| | Unit | % | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U63** | Amount of escape at hole bottom for planetary tapping cycle | | Specify the amount of escape at hole bottom of the planetary tapping cycle in terms of total threads.<br>Amount of escape = Tapping pitch × **U63**/10<br>  |
| | Unit | 0.1 thread | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U64** | Specification of automatic pre-holing feed rate value for planetary tapping cycle | | Set the pre-holing feed rate for the planetary tapping cycle. |
| | Unit | 0.01 mm/rev or 0.001 inch/rev | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U65** | Delay timer of M code for the parts catcher (No. 1 headstock) | | Set dwell time for the parts catcher at No. 1 spindle head. |
| | Unit | 0.001 sec | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **U66** | Delay timer of M code for the parts catcher<br>(No. 2 headstock) | | Set dwell time for the parts catcher at No. 2 spindle head. |
| | Unit | 0.001 sec | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U67** | M-code value for making shape correction valid in the MAZATROL program | | To make the shape correction function valid in the MAZATROL program, assign the value of **U67** as the M-code.<br>Also, the value of **U67** is output as the M-code.<br>However, M121 is output if '0' is specified in this parameter. |
| | Unit | – | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U68** | M-code value for making shape correction invalid in the MAZATROL program | | To make the shape correction function invalid in the MAZATROL program, assign the value of **U68** as the M-code.<br>Also, the value of **U68** is output as the M-code.<br>However, M122 is output if '0' is specified in this parameter. |
| | Unit | – | |
| | Effective condition | Instant | |
| | Applicable program | M | |

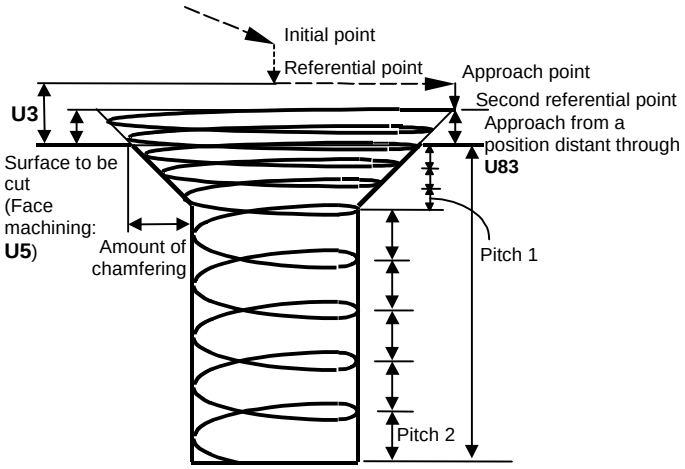
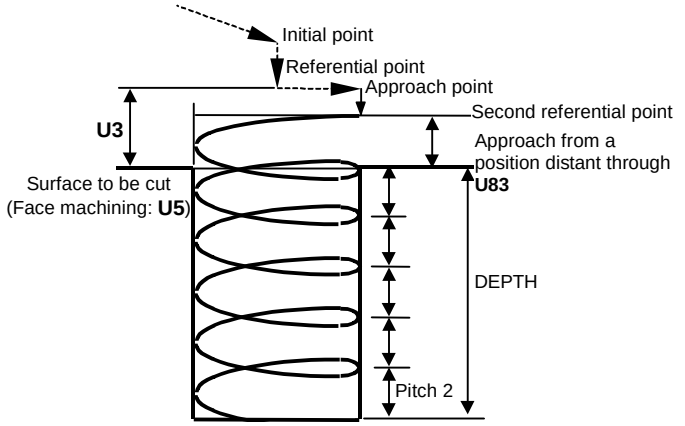
| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">U71</td><td colspan="2">Selection of transfer pattern (TRS)</td><td rowspan="4">Transfer pattern for the intended workpiece is specified by selecting 0, 1, 2 or 3 described below.<br><br><table><tr><th>Setting</th><th>Description</th></tr><tr><td>0</td><td>CHK, BAR : standard operation<br>[CHK] : cannot be selected</td></tr><tr><td>1</td><td>CHK, BAR : standard operation<br>[CHK] : cannot be selected</td></tr><tr><td>2</td><td>CHK, BAR : high-speed operation<br>[CHK] : cannot be selected</td></tr><tr><td>3</td><td>CHK, BAR : high-speed operation<br>[CHK] : cannot be selected</td></tr></table><br>Notes:<br>1. Selecting [CHK] function specifies the transfer pattern by the gantry robot.<br>2. Even if 2 or 3 is selected, the operation of CHK or BAR may become standard one depending on machine model.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">U75</td><td colspan="2">Timer setting for manual TOOL EYE measurement</td><td rowspan="4">During manual TOOL EYE measurement, it will not be regarded as a sensor ON status even if a sensor turns on for a time shorter than that which has been set in this parameter.</td></tr>
<tr><td>Unit</td><td>7.1 msec</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">U78</td><td colspan="2">Selection as to tool life management alarm display</td><td rowspan="4">Select whether alarms on tool life management (based on time, quantity and wear) are to be displayed.<br>U78 = 0<br>Alarms on tool life management are displayed.<br>[Time] Alarm No. 177 “TOOL LIFE EXCEED TIME”<br>[Quantity] Alarm No. 178 “USED TOOL NUMBER EXCEED”<br>[Wear] Alarm No. 179 “X-MAX OR Z-MAX OFFSET OVER”<br>U78 = 1<br>Alarms are not displayed and machining continues.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

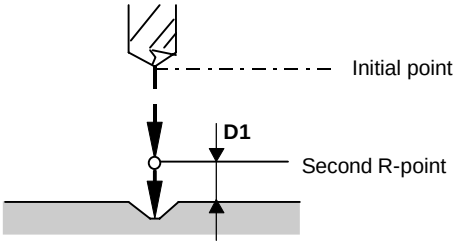
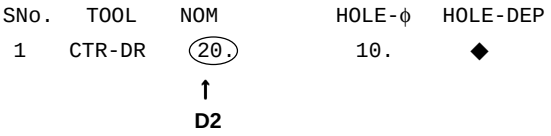
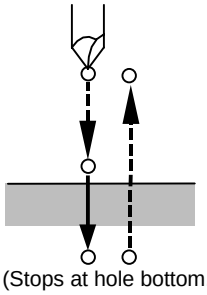
| Address | Meaning | | Description |
|---|---|---|---|
| **U79** | Setting range of MTP dwell time data | | **U79** = 0<br>Any data from 0 to 99999 msec can be set on the PROGRAM display.<br><br>**U79** = 1 to 65535<br>Any data from 0 to **U79** – 1 msec can be set on the PROGRAM display. |
| | Unit | msec | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U81** | Raw jaw forming workpiece length | | This parameter determines the workpiece length to be set in a program that has been automatically edited using the raw jaw forming function.<br><br><For outside jaw 1 and inside jaw 1><br>Workpiece length = #4 + **U81**<br>(#4 : Raw jaw forming data)<br><br><For outside jaw 2 and inside jaw 2><br>Workpiece length = #4 + #6 + **U81**<br>(#4, #6 : Raw jaw forming data) |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **U82** | Specification of automatic feed rate value for planetary tapping cycle | | Set the automatic feed rate for the planetary tapping cycle. |
| | Unit | 0.01 mm/rev or 0.001 inch/rev | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, CUTTING) |
|---|---|

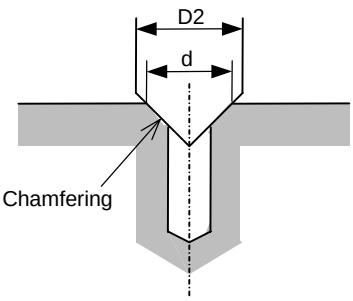
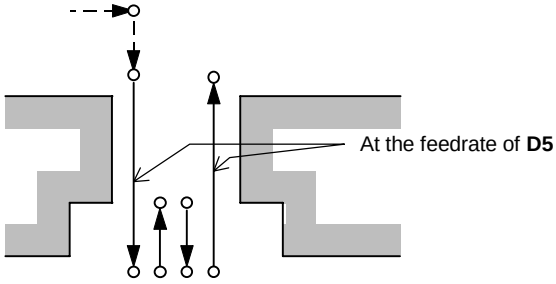
| Address | Meaning | | Description |
|---|---|---|---|
| **U83** | Height of the second referential point during the Tornado cycle | | Set the height of the second referential point during the Torando cycle.<br>With chamfering ($i_0 \neq 0$)<br>  <br><br>Without chamfering ($i_0 = 0$)<br>  <br><br>MEP322 |
| | | Unit: 0.001 mm or 0.0001 inches | |
| | | Effective condition: Instant | |
| | | Applicable program: M | |

## 3-5 PARAMETER (USER, POINT D)

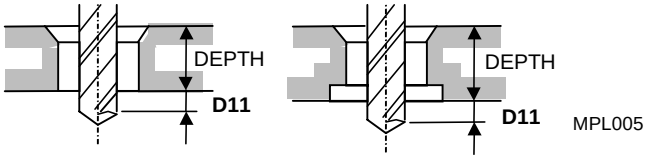
| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D1</td><td colspan="2" rowspan="2">Height of the second referential point during point machining</td><td rowspan="4">Height of the second R-point<br>  <br><br>MPL001<br>The heigt of the referential point during point machining is basically U3 to U6, however, it is changed to D1 under the following conditions.<br><table><tr><th>Tool sequence</th><th>Conditions</th></tr><tr><td>Drill</td><td>Bit 6 of parameter D91 is set to 1 (D1 valid). There is a spot drill in the pre-machining tool sequence of the same unit.</td></tr><tr><td>Reamer</td><td>Bit 2 of parameter D92 is set to 1 (D1 valid). There is a chamfering cutter in the pre-machining tool sequence of the same unit.</td></tr></table><br>However, when a drills is included in the pre-machining tool sequence in case of a drilling tool sequence, the height is changed to D42. (Refer to D42.)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D2</td><td colspan="2" rowspan="2">Nominal diameter of spot-machining tool</td><td rowspan="4">The nominal diameter of a spot-machining tool that is automatically set during automatic tool development.<br>Example:<br>  <br></td></tr>
<tr><td>Unit</td><td>1 mm or 0.1 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D3</td><td colspan="2" rowspan="2">Spot-machining hole bottom dwell time element</td><td rowspan="4">Axis feed dwell time at the hole bottom in a spot-machining cycle. Set this time in milling spindle revolutions.<br>  <br>(Stops at hole bottom.)<br>When the spot-machining tool reaches the hole bottom, the Z-axis will firstly stop moving until the milling spindle makes D3 revolutions, and then return to the original position at the rapid feedrate.<br>MPL002</td></tr>
<tr><td>Unit</td><td>Revolution</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, POINT) |
|---|---|

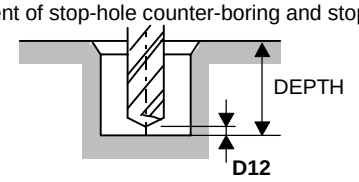
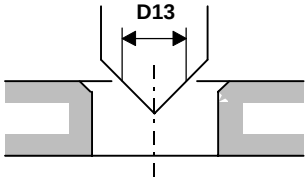
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D4</td><td colspan="2">Maximum allowable spot-chamfering hole diameter element</td><td rowspan="4">Element used to set the maximum spot-chamfering hole diameter (d) during automatic tool development<br>  <br><br>Spot-chamfering occurs if d ≤ D2 – D4.<br>If d > D2 – D4, the chamfering cutter is developed automatically.<br>MPL003</td></tr>
<tr><td>Unit</td><td>0.1 mm or 0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D5</td><td colspan="2">Prehole through speed during inversed spot-facing</td><td rowspan="4">The feedrate of a tool as it is being passed through the prehole during an inversed spot-facing cycle<br>Note: 0.5 mm/rev if this parameter setting is 0.<br>  <br><br>MPL004</td></tr>
<tr><td>Unit</td><td>1 mm or 0.1 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D6</td><td colspan="2">Drill-machining cycle setting element</td><td rowspan="8">Element used to automatically set drill-machining cycles during automatic tool development<br><table><tr><th>Machining cycle</th><th>Conditions</th></tr><tr><td>Drilling cycle</td><td>$\frac{\text{DEPTH}}{\text{DIA}} \leq$ D6</td></tr><tr><td>High-speed deep-hole drilling cycle</td><td>D6 $< \frac{\text{DEPTH}}{\text{DIA}} \leq$ D7</td></tr><tr><td>Deep-hole drilling cycle</td><td>D7 $< \frac{\text{DEPTH}}{\text{DIA}}$</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D7</td><td colspan="2">Drill-machining cycle setting element</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, POINT) |
|---|---|

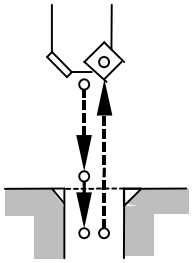
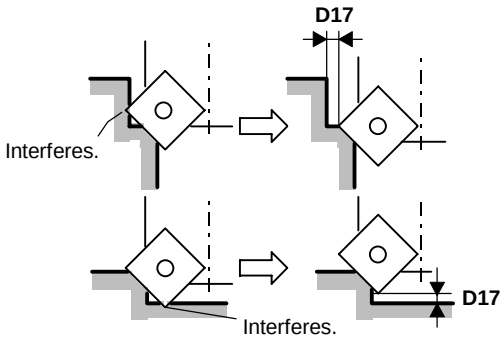
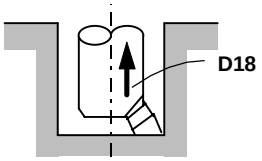
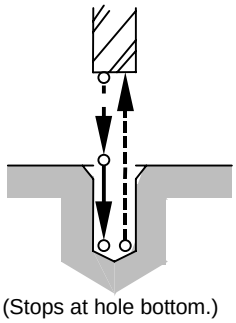
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D8</td><td colspan="2">Maximum diameter of holes machinable on one drill</td><td rowspan="13">Element used to automatically set the number of drills which are automatically developed according to the hole diameter of the drill unit<br><br><table><tr><th>Number of drills developed</th><th>Conditions</th></tr><tr><td>1</td><td>DIA ≤ D8</td></tr><tr><td>2</td><td>D8 < DIA ≤ D9</td></tr><tr><td>3</td><td>D9 < DIA ≤ D10</td></tr><tr><td>Alarm</td><td>D10 < DIA</td></tr></table></td></tr>
<tr><td>Unit</td><td>1 mm or 0.1 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D9</td><td colspan="2">Maximum diameter of holes machinable on two drills</td></tr>
<tr><td>Unit</td><td>1 mm or 0.1 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D10</td><td colspan="2">Maximum diameter of holes machinable on three drills</td></tr>
<tr><td>Unit</td><td>1 mm or 0.1 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D11</td><td colspan="2">Through-hole/Tap-prehole machining overshoot</td><td rowspan="4">Element used to automatically set the hole-drilling, endmilling, and boring depths during automatic tool development of inversed spot-facing, tapping, back-boring, through-hole drilling, through-hole counter-boring, and spot-faced tapping units<br><br> 

MPL005<br><br>Example:<br>SNo. TOOL NOM HOLE-ϕ HOLE-DEP<br>1 DRILL 10. 10. (21.) ← (DEPTH + D11)<br><br>Note: See also parameter K20 for tapping units.</td></tr>
<tr><td>Unit</td><td>0.1 mm or 0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

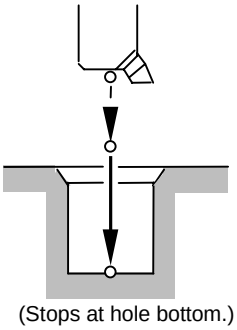
| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D12</td><td colspan="2">Stop-hole machining hole-bottom clearance</td><td rowspan="4">Element used to automatically set the hole-drilling depth during automatic tool development of stop-hole counter-boring and stop-hole boring units<br>  <br><br>MPL006<br>Example:<br>SNo. TOOL NOM HOLE-ϕ HOLE-DEP<br>1 DRILL 10. 10. (19.)<br>(DEPTH – tool tip compensation – D12)<br>Note:<br>This parameter is invalid when the residual hole diameter is not 0.</td></tr>
<tr><td>Unit</td><td>0.1 mm or 0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D13</td><td colspan="2">Spot-machining hole diameter (fixed value)</td><td rowspan="4">Hole diameter is automatically set during automatic tool development when spot-chamfering is not to be performed.<br>  <br><br>MPL007<br>Example:<br>SNo. TOOL NOM HOLE-ϕ HOLE-DEP<br>1 CTR-DR 20. (10.) ◆<br>↖ D13</td></tr>
<tr><td>Unit</td><td>1 mm or 0.1 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D14</td><td colspan="2">Depth-of-cut setting element for drilling (ALMINUM)</td><td rowspan="8">Element used to automatically set the depth-of-cut per drilling operation during automatic tool development<br>HOLE-ϕ × D14 : when the material of the stock workpiece is AL (aluminum) in article MAT. 6<br>HOLE-ϕ × D15 : when the material of the stock workpiece is other than AL in article MAT. 6</td></tr>
<tr><td>Unit</td><td>0.1</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D15</td><td colspan="2">Depth-of-cut setting element for drilling (except AL)</td></tr>
<tr><td>Unit</td><td>0.1</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

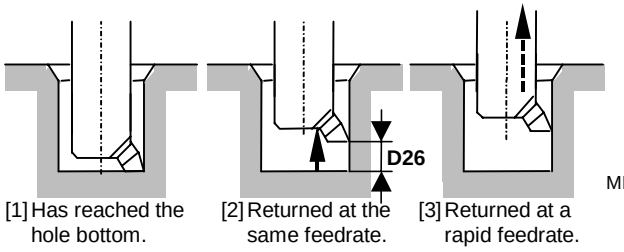
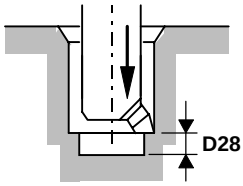
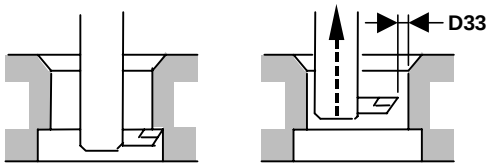
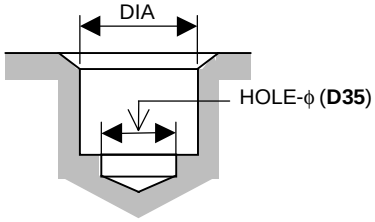
| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D16</td><td colspan="2">Hole-bottom dwell time for chamfering cutter</td><td rowspan="4">Z-axis feed dwell time at the hole bottom in a chamfering cutter machining cycle. Set this time in milling spindle revolutions.<br>  <br>(Stops at hole bottom.)<br>When the chamfering cutter reaches the hole bottom, the axis will firstly stop moving until the milling spindle makes D16 revolutions, and then return to the original position at the rapid feedrate.<br>Note:<br>This parameter is invalid for chamfering with true-circle processing.<br>MPL008</td></tr>
<tr><td>Unit</td><td>Revolution</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D17</td><td colspan="2">Interference clearance of chamfering cutter</td><td rowspan="4">The clearance in order to prevent tool interference with a wall of the workpiece or with the hole bottom during a chamfering cycle<br>  <br><br>MPL009</td></tr>
<tr><td>Unit</td><td>0.01 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D18</td><td colspan="2">Return feedrate for reaming or boring (cycle 3)</td><td rowspan="4">The feedrate at which the tool is returned from the hole bottom during reaming or boring.<br>  <br><br>MPL010<br>Notes:<br>1. Valid only when the setting of ZFD for the reamer (tool sequence) is G01.<br>2. Valid only when the setting of PRE-DIA for the boring tool (tool sequence) is CYCLE 3.<br>3. If this parameter is 0, the tool is returned at the same feedrate as that of cutting.</td></tr>
<tr><td>Unit</td><td>1 mm/min or 0.1 inch/min</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D19</td><td colspan="2">Hole-bottom dwell time for end milling</td><td rowspan="4">Axis feed dwell time at the hole bottom in an end milling cycle. Set this time in milling spindle revolutions.<br>  <br>(Stops at hole bottom.)<br>When the end mill reaches the hole bottom, the axis will firstly stop moving until the milling spindle makes D19 revolutions, and then return to the original position at the rapid feedrate.<br>Note:<br>This parameter is invalid for true-circle processing.<br>MPL011</td></tr>
<tr><td>Unit</td><td>Revolution</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

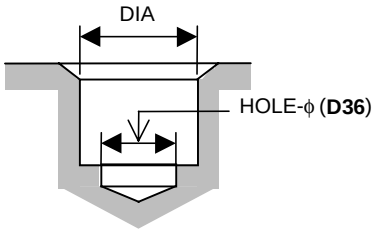
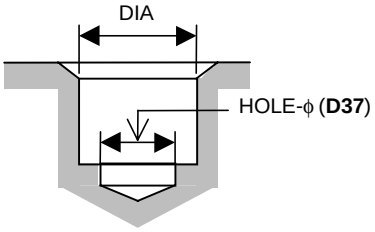
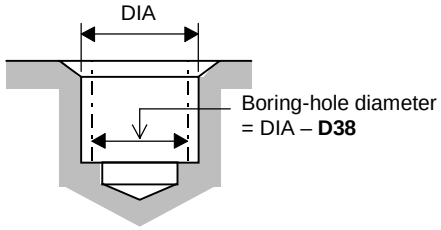
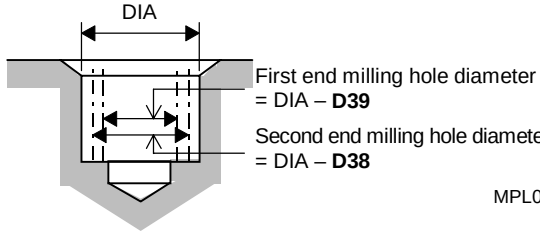
| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D20</td><td colspan="2">Radial depth-of-cut setting element for end milling</td><td rowspan="4">Element used to automatically set the radial depth-of-cut per end milling operation<br>Depth-of-cut = nominal diameter × D20<br>Depth-of-cut is automatically set according to the value of this parameter when nominal diameter of the end mill is input.<br>Example:<br>SNo. TOOL NOM HOLE-ϕ HOLE-DEP PRE-DIA PRE-DEP RGH DEPTH<br>1 E-MILL 20. 40. 10. 30. ◆ 0. 12.<br>(NOM × D20)</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D21</td><td colspan="2">Reference bottom-finishing allowance for end milling</td><td rowspan="4">The reference value for calculation of a bottom-finishing allowance which corresponds to the roughness level of the end milling (tool sequence). The finishing allowance in the case of roughness level 4 becomes the value of this parameter, and the values for all other roughness levels are set using the expressions listed in the table below.<br><table><tr><th>Roughness</th><th>Bottom-finishing allowance</th></tr><tr><td>0 to 3</td><td>0.0</td></tr><tr><td>4</td><td>D21</td></tr><tr><td>5</td><td>D21 × 0.7</td></tr><tr><td>6</td><td>D21 × 0.7 × 0.7</td></tr><tr><td>7</td><td>D21 × 0.7 × 0.7 × 0.7</td></tr><tr><td>8</td><td>D21 × 0.7 × 0.7 × 0.7 × 0.7</td></tr><tr><td>9</td><td>D21 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7</td></tr></table></td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D22</td><td colspan="2">Tapping-cycle dwell time</td><td rowspan="4">Dwell time at the hole bottom in the tapping cycle.<br>Note:<br>This parameter is valid only when the setting for roughness of tapping (tool sequence) is FIX.</td></tr>
<tr><td>Unit</td><td>0.01 sec</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D24</td><td colspan="2">Hole-bottom dwell time for boring</td><td rowspan="4">Axis feed dwell time at the hole bottom in a boring cycle. Set this time in milling spindle revolutions.<br>  <br>(Stops at hole bottom.)<br>When the boring bar reaches the hole bottom, the axis will firstly stop moving until the milling spindle makes D24 revolutions, and then the milling spindle orientation will be performed.<br>Note:<br>This parameter is invalid if the roughness of the boring (tool sequence) is 0.<br>MPL013</td></tr>
<tr><td>Unit</td><td>Revolution</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

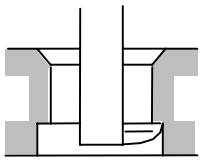
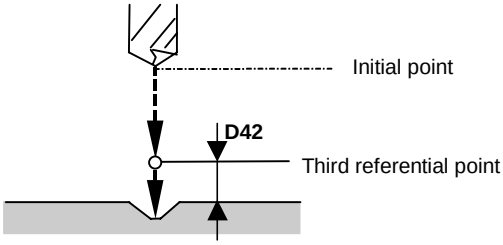
| Title of display | PARAMETER (USER, POINT) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **D26** | Boring or back-boring hole-bottom return | | The distance which the boring or back-boring tool is returned at the same feedrate as for cutting after the tool has reached the hole bottom<br>  <br><br>MPL015<br>[1] Has reached the hole bottom. [2] Returned at the same feedrate. [3] Returned at a rapid feedrate.<br>**Note:**<br>Not valid if the setting for the roughness of the boring (tool sequence) is 1. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **D28** | Bottom-finishing amount of boring | | The distance which the boring bar is fed in at 70% of the original feedrate to finish the hole bottom<br>  <br><br>MPL016<br>The feedrate is reduced to 70% of the original value before the hole bottom is reached.<br>**Note:**<br>Not valid if the setting for the roughness of the boring (tool sequence) is 1. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **D33** | Back-boring tool tip relief | | The amount of relief provided for a back-boring tool tip to be kept clear of the prehole walls as it is being passed through the prehole in the oriented state of the spindle<br>  <br><br>[1] During back-boring [2] During passage<br>MPL019 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **D35** | Prehole-drilling diameter setting element for reamer (drilling) | | Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining unit is drilling.)<br>  <br><br>MPL020<br>**Example:**<br>SNo. TOOL NOM HOLE-ϕ<br>1 DRILL 10. (10.) ← **D35** |
| | Unit | 0.01 mm or 0.001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |

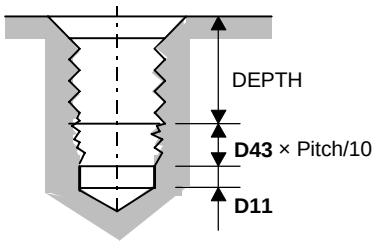
| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D36</td><td colspan="2">Prehole-drilling diameter setting element for reamer (boring)</td><td rowspan="4">used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining unit is boring.)<br>  <br><br>MPL020<br>Example:<br>SNo. TOOL NOM HOLE-ϕ<br>1 DRILL 10. (10.) ← D36</td></tr>
<tr><td>Unit</td><td>0.01 mm or 0.001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D37</td><td colspan="2">Prehole-drilling diameter setting element for reamer (end milling)</td><td rowspan="4">Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining unit is end milling.)<br>  <br><br>MPL020<br>Example:<br>SNo. TOOL NOM HOLE-ϕ<br>1 DRILL 10. (10.) ← D37</td></tr>
<tr><td>Unit</td><td>0.01 mm or 0.001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D38</td><td colspan="2">Machining hole diameter setting element for boring tool or end mill in the reamer unit</td><td rowspan="4">1) In automatic tool development of the reamer unit, if the pre-machining unit is boring:<br>  <br><br>MPL021<br>Example:<br>SNo. TOOL NOM HOLE-ϕ<br>1 BOR BAR 10. (10.) ← (DIA – D38)<br>2) In automatic tool development of the reamer unit, if the pre-machining unit is end milling:<br>  <br><br>MPL022<br>Example:<br>SNo. TOOL NOM HOLE-ϕ<br>1 E-MILL 15. (20.) ← (DIA – D39)<br>1 E-MILL 10. (21.) ← (DIA – D38)</td></tr>
<tr><td>Unit</td><td>0.01 mm or 0.001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D39</td><td colspan="2">Machining hole diameter setting element for end mill in the reamer unit</td></tr>
<tr><td>Unit</td><td>0.01 mm or 0.001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

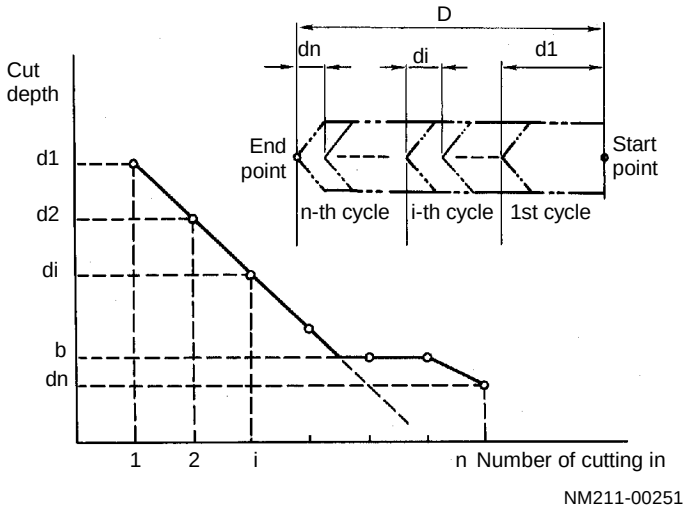
| Title of display | PARAMETER (USER, POINT) |
|---|---|

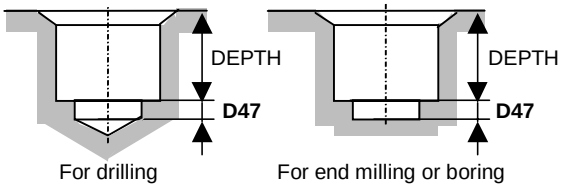
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D40</td><td colspan="2">Spot-faced hole bottom dwell time for inversed spot-facing</td><td rowspan="4">Axis feed dwell time at the spot-faced hole bottom in an inversed spot facing cycle. Set this time in milling spindle revolutions.<br>  <br>(Feeding stops at hole bottom.)<br>When the inversed spot-facing tool reaches the hole bottom, firstly the axis will stop moving until the milling spindle makes D40 revolutions, and then the rotational direction of the milling spindle will reverse.<br>MPL023</td></tr>
<tr><td>Unit</td><td>Revolution</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D42</td><td colspan="2">Height of the third referential point during point machining</td><td rowspan="4">Height of the third referential point<br>  <br><br>MPL001<br>The height of the referential point during point machining is basically U3 to U6, however, it is changed to D42 under the following conditions.<br><table><tr><th>Tool sequence</th><th>Conditions</th></tr><tr><td>Drill</td><td>- Bit 6 of parameter D91 is set to 1 (D42 valid).<br>- There is a spot drill in the pre-machining tool sequence of the same unit.</td></tr><tr><td>Chamfering cutter</td><td>- Bit 7 of parameter D91 is set to 1 (D42 valid).<br>- CYCLE 2 is selected for the machining cycle.</td></tr></table></td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D43</td><td colspan="2">Number of incomplete threads in tapping cycle</td><td rowspan="4">To set number of incomplete threads in tapping cycle for piped screws (PT, PF, PS). In tapping, internal thread is tapped extra for the depth of (D43 × pitch/10).<br>This is also used as an element for automatically determining hole-drilling depth in the automatic tool development of the tapping unit.<br>  <br><br>MPL07<br>Example:<br>SNo. TOOL NOM HOLE-ϕ HOLE-DEP<br>1 DRILL 10. 10. (19.)<br>↑<br>DEPTH + D11 + (D43 × pitch/10)</td></tr>
<tr><td>Unit</td><td>Pitch/10</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D44</td><td colspan="2">Automatic calculation method for the amount of chamfering using the tapping unit</td><td rowspan="4">This parameter specifies a method of automatic calculation of the amount of chamfering using the tapping unit.<br>0: Amount of chamfering = $\frac{(\text{MAJOR-}\phi + 2 \times \text{PITCH}) - \text{PRE-DIA}}{2}$<br>1: Amount of chamfering = $\frac{\text{MAJOR-}\phi - \text{PRE-DIA}}{2}$<br>Note:<br>Select 1 for a thin part if the loss of the threaded section by chamfering is likely.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D45</td><td colspan="2">Amount of mill-drilling depth attenuation</td><td>Set the amount of mill-drilling depth attenuation.<br> 

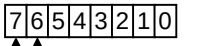
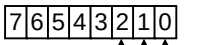
NM211-00251<br>D : Drilling depth<br>d1 : Cut depth in 1st cycle<br>di : Cut depth in i-th cycle<br>di : d1 – D45 × (i – 1) (di ≥ b)<br>di : b (di < b)<br>b : Drilling depth clamping value (D46)<br>(⇨D46)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D46</td><td colspan="2">Mill-drilling depth clamping value</td><td>Set the minimum drilling depth.<br>(⇨D45)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D47</td><td colspan="2">Reamer-prehole machining overshoot</td><td>Element used to automatically set the hole depth of drilling, end milling and boring during automatic tool development of the reamer unit<br> 

MPL025<br>Example:<br>SNo. TOOL NOM HOLE-ϕ HOLE-DEP<br>1 DRILL 10. 10. (21.) ← (DEPTH + D47)</td></tr>
<tr><td>Unit</td><td>0.01 mm or 0.001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, POINT) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">D73<br>to<br>D75</td><td colspan="2">Learning of cutting conditions<br>(For end mill, DEP-A range)</td><td rowspan="4">Specify the range of end mill DEP-A using the cutting-conditions learning function.<br>The cutting conditions will be learned when the specified DEP-A range falls within the specifications shown below.<br>Re-learning will not occur if the learned data already exists.<br>Set the value of the “cutting depth/tool diameter” (0.1% steps) as the range of end mill DEP-A.
<table>
<tr><td>DEP-A range</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>DEP-A/NOM<br>(0.1 %)</td><td>0 to D73</td><td>D73 to D74</td><td>D74 to D75</td></tr>
</table>
</td></tr>
<tr><td>Unit</td><td>0.1 %</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D76<br>D77</td><td colspan="2">Learning of cutting conditions<br>(For face mill, DEP-A range)</td><td rowspan="4">Specify the range of face mill DEP-A using the cutting-conditions learning function.<br>The cutting conditions will be learned when the specified DEP-A range falls within the specifications shown below.<br>Re-learning will not occur if the learned data already exists.<br>Set the value of the cutting depth (0.1 mm/0.01 inch steps) as the range of face mill DEP-A.
<table>
<tr><td>DEP-A range</td><td>1</td><td>2</td></tr>
<tr><td>DEP-A<br>(0.1 mm/0.01 in.)</td><td>0 to D76</td><td>D76 to D77</td></tr>
</table>
</td></tr>
<tr><td>Unit</td><td>0.1 mm or<br>0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D78<br>D79</td><td colspan="2">Learning of cutting conditions<br>(Boring tool/Back boring tool, DEP-R range)</td><td rowspan="4">Specify the range of boring/back boring tool DEP-R using the cutting-conditions learning function.<br>The cutting conditions will be learned when the specified DEP-R range falls within the specifications shown below.<br>Re-learning will not occur if the learned data already exists.<br>Set the value of the cutting depth (0.1 mm/0.01 inch steps) as the range of boring/back boring tool DEP-R.
<table>
<tr><td>DEP-R range</td><td>1</td><td>2</td></tr>
<tr><td>DEP-R<br>(0.1 mm/0.01 in.)</td><td>0 to D78</td><td>D78 to D79</td></tr>
</table>
</td></tr>
<tr><td>Unit</td><td>0.1 mm or<br>0.01 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">D80<br>to<br>D82</td><td colspan="2">Learning of cutting conditions<br>(End mill, DEP-R range)</td><td rowspan="4">Specify the range of end mill DEP-R using the cutting-conditions learning function.<br>The cutting conditions will be learned when the specified DEP-R range falls within the specifications shown below.<br>Re-learning will not occur if the learned data already exists.<br>Set the value of the “cutting depth/tool diameter” (0.1% steps) as the range of end mill DEP-R.
<table>
<tr><td>DEP-R range</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>DEP-R/NOM<br>(0.1 %)</td><td>0 to D80</td><td>D80 to D81</td><td>D81 to D82</td></tr>
</table>
</td></tr>
<tr><td>Unit</td><td>0.1 %</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, POINT) |
|---|---|

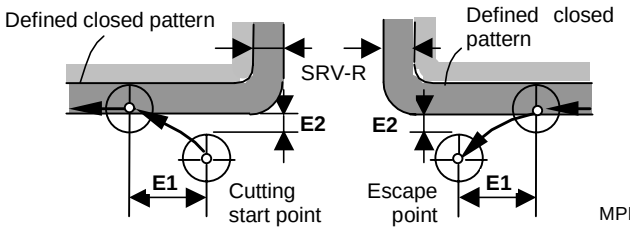
| Address | Meaning | | Description |
|---|---|---|---|
| **D91** | — | |  (1: Execution, 0: No execution)<br>If a spot drill/drill is included in the pre-machining tool sequence of the same unit, the referential point height of the drill is set as **D1** or **D42**.<br>The referential point height of the chamfering cutter during the cycle 2 is set as **D42**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **D92** | — | |  (1: Execution, 0: No execution)<br>During a true-circle processing (end milling) cycle, **K41** is used for axial feed.<br>The referential point 1 height of the back spot facing is set as **D1**.<br>If a chamfering cutter is included in the pre-machining tool sequence of the same unit, the referential point height of the reamer is set as **D1**. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **D95 (bit 0)** | Data auto-setting method selection for pipe tapping | | **P95** (bit 0) = 0: Conventional method<br>**P95** (bit 0) = 1: Text file registration data reference method<br>Data that has been registered in the required text file is used for automatic pipe-tapping data setting in MAZATROL PROGRAM display or TOOL DATA display. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **D95 (bit 1)** | Data auto-setting method selection for unified tapping | | **P95** (bit 1) = 0: Conventional method<br>**P95** (bit 1) = 1: Text file registration data reference method<br>Data that has been registered in the required text file is used to set the pre-hole drilling diameter automatically for automatic development of unified tapping data in MAZATROL PROGRAM display. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, POINT) |
|---|---|

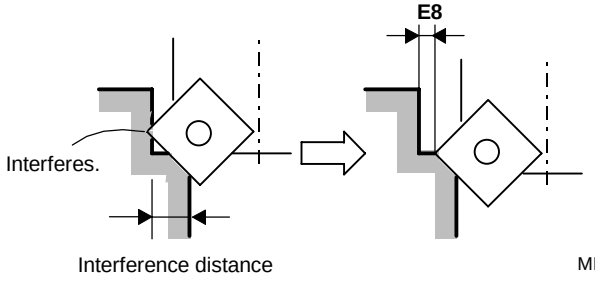
| Address | Meaning | | Description |
|---|---|---|---|
| **D95 (bit 2)** | Data auto-setting method selection for metric tapping | | **P95** (bit 2) = 0: Conventional method<br>**P95** (bit 2) = 1: Text file registration data reference method<br><br>Data that has been registered in the required text file is used to set the pre-hole drilling diameter automatically for automatic development of metric tapping data in MAZATROL PROGRAM display. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

## 3-6 PARAMETER (USER, LINE E)

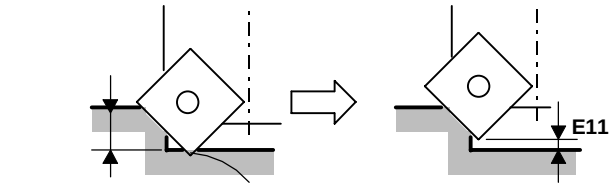
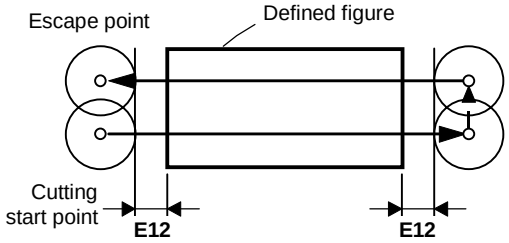
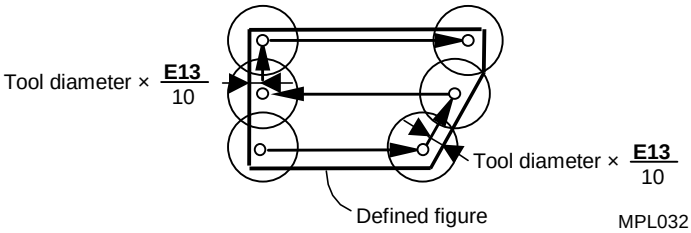
| Title of display | PARAMETER (USER, LINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">E1</td><td colspan="2">Closed-pattern cutting start point and escape point setting element</td><td rowspan="4">Element used to set cutting start point and escape point for closed-pattern line- or face-machining<br>Example:<br>  <br><br>MPL026<br>[Applicable units]<br>- LINE OUT, LINE IN, CHMF OUT and CHMF IN<br>- Wall finishing of POCKET</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E4</td><td colspan="2">Reference allowance of finishing in radial direction</td><td rowspan="4">The reference value of each finishing allowance R (FIN-R) which is automatically set when the roughness levels of the line- or face-machining units have been set<br>The finishing allowance R in the case of roughness level 4 becomes the value of this parameter, and the values for all other roughness levels are calculated using the expressions listed in the table below.<br><table><tr><th>Roughness</th><th>FIN-R</th></tr><tr><td>0 to 3</td><td>0.0</td></tr><tr><td>4</td><td>E4</td></tr><tr><td>5</td><td>E4 × 0.7</td></tr><tr><td>6</td><td>E4 × 0.7 × 0.7</td></tr><tr><td>7</td><td>E4 × 0.7 × 0.7 × 0.7</td></tr><tr><td>8</td><td>E4 × 0.7 × 0.7 × 0.7 × 0.7</td></tr><tr><td>9</td><td>E4 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7</td></tr></table></td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E5</td><td colspan="2">Element used to set the cutting start point and escape point (the second clearance)</td><td rowspan="4">Element used to set the cutting start point and escape point (the second clearance)<br>U10 is used generally as a clearance on the plane, however, E5 is used when the condition meets both of 1) and 2) mentioned below.<br>1) There is pre-machining in the same unit.<br>2) The parameter (E92, E95) that makes E5 effective is set to ON (1).<br>[Applicable units]<br>LINE OUT, LINE IN, POCKET<br>[Related parameters]<br>E92 bit 3<br>E95 bit 7<br>} Parameter that effectuates E5 in the applicable unit.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

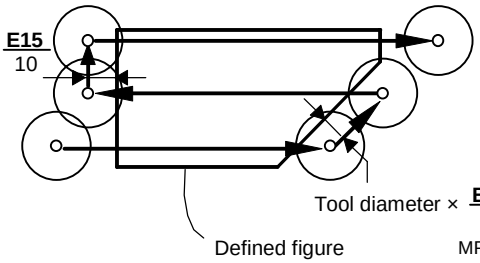
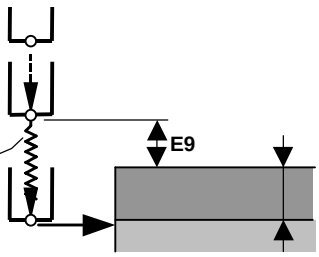
| Title of display | PARAMETER (USER, LINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">E6</td><td colspan="2">Reference allowance of finishing in axial direction</td><td rowspan="4">The reference value of each finishing allowance which is automatically set when the roughness levels of the line- or face-machining units have been set<br>The finishing allowance in the case of roughness level 4 becomes the value of this parameter, and the values for all other roughness levels are calculated using the expressions listed in the table below.<br><table><tr><th>Roughness</th><th>FIN-A</th></tr><tr><td>0 to 3</td><td>0.0</td></tr><tr><td>4</td><td>E6</td></tr><tr><td>5</td><td>E6 × 0.7</td></tr><tr><td>6</td><td>E6 × 0.7 × 0.7</td></tr><tr><td>7</td><td>E6 × 0.7 × 0.7 × 0.7</td></tr><tr><td>8</td><td>E6 × 0.7 × 0.7 × 0.7 × 0.7</td></tr><tr><td>9</td><td>E6 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7</td></tr></table></td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E7</td><td colspan="2">Allowance of cutting start point in axial direction (the second clearance)</td><td rowspan="4">Allowance of cutting start point in axial direction<br>For the line- or face-machining, U3 to U6 is used as an axial clearance for rapid access to the machining point from the initial point, however, E7 is used when the condition meets both of 1) and 2) mentioned below.<br>1) There is pre-machining in the same unit.<br>2) The parameter (E92, E95, E96 and E97) that makes E7 effective is set to ON (1).<br>[Applicable units]<br>All line-/face-machining units except the face milling face unit.<br>[Related parameters]<br>E92 bit 2<br>E95 bit 6<br>E96 bit 1<br>E97 bit 2 } Parameter that effectuates E7 in the applicable unit.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E8</td><td colspan="2">Radial interference clearance of chamfering cutter</td><td rowspan="4">The amount of clearance that prevents interference of the chamfering cutter with the hole walls during face-machining<br> 
</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

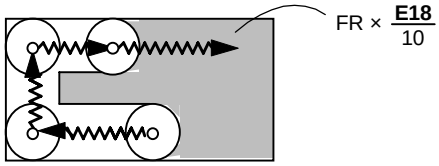
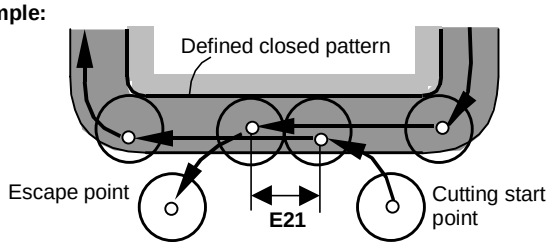
| Title of display | PARAMETER (USER, LINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">E10</td><td colspan="2">Depth-of-cut-R automatic setting element (Face milling, End milling-top)</td><td rowspan="4">Element used to automatically set the radial depth-of-cut of the tool sequence in FACE MIL or TOP EMIL unit<br>WID-R = $\frac{\text{NOM} \times \textbf{E10}}{10}$<br>Example:<br>SNo. TOOL NOM APRCH-1 APRCH-2 TYPE AFD DEP-A WID-R<br>R1 F-MILL 100A ? ? XBI ◆ 1. 19.<br>↑<br>$\frac{\text{NOM} \times \textbf{E10}}{10}$</td></tr>
<tr><td>Unit</td><td>10%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E11</td><td colspan="2">Axial interference clearance of chamfering cutter</td><td rowspan="4">The amount of clearance that prevents interference of the chamfering cutter with the hole bottom during chamfering<br>  <br><br>MPL030</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E12</td><td colspan="2">Radial interference clearance of face milling unit</td><td rowspan="4">The amount of clearance that prevents interference between the tool and the figure during face milling<br>Example:<br>  <br><br>MPL031</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E13</td><td colspan="2">Tool path setting element for end milling-top unit</td><td rowspan="4">Element used to set the tool path internal to the figure for end milling-top unit<br>Example:<br>  <br><br>MPL032</td></tr>
<tr><td>Unit</td><td>10%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

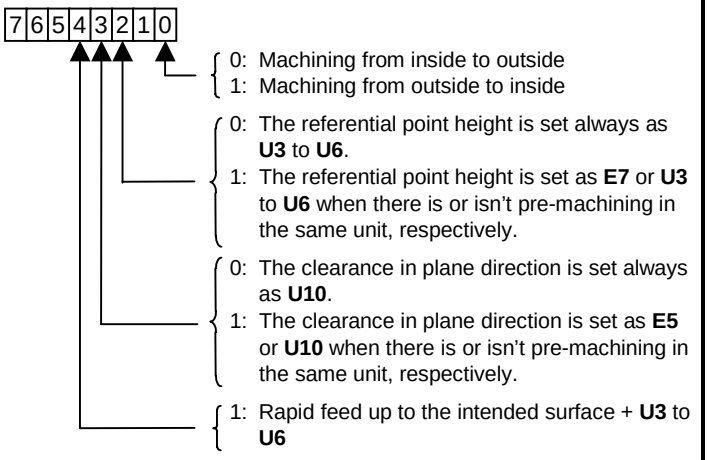
| Title of display | PARAMETER (USER, LINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">E14</td><td colspan="2">Depth-of-cut-R automatic setting element (Pocket milling)</td><td rowspan="4">Element used to automatically set the radial depth-of-cut of the tool sequence in POCKET unit<br>WID-R = $\frac{\text{NOM} \times \textbf{E14}}{10}$<br>Example:<br>SNo. TOOL NOM APRCH-1 APRCH-2 TYPE AFD DEP-A WID-R<br>R1 E-MILL 20. ? ? CW G01 10. (12.)<br>↑<br>$\frac{\text{NOM} \times \textbf{E14}}{10}$</td></tr>
<tr><td>Unit</td><td>10%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E15</td><td colspan="2">Tool path setting element for face milling-top unit (reciprocating short)</td><td rowspan="4">Element used to set the tool path external to the defined figure for reciprocating-short machining with face milling unit<br>Example:<br>Tool diameter × $\frac{\textbf{E15}}{10}$<br>  <br></td></tr>
<tr><td>Unit</td><td>10%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E17</td><td colspan="2">Axial cutting feed override</td><td rowspan="4">Denote the feed override value for axial movement to the intended plane during the use of a line- or plane-machining unit, except for face-milling.<br>Notes:<br>1. This parameter is valid only when tool sequence AFD is G01.<br>2. Feed override is invalid if this parameter is “0”.<br>Example:<br>Feed in the tool sequence × $\frac{\textbf{E17}}{10}$<br>  <br></td></tr>
<tr><td>Unit</td><td>10%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

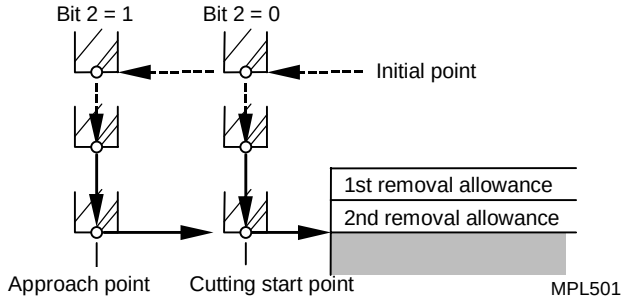
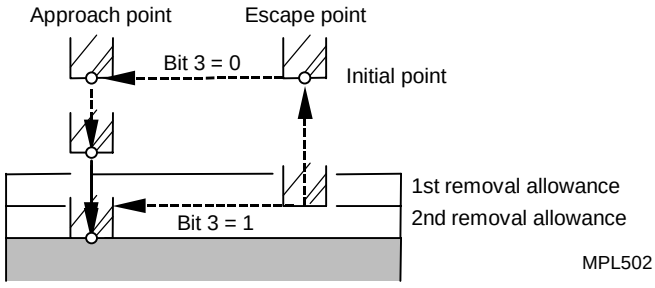
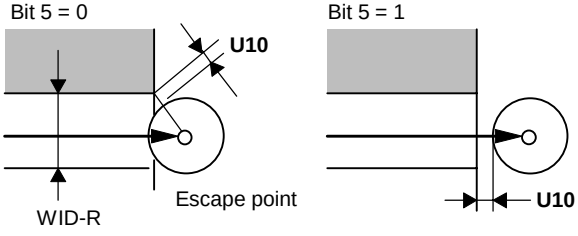
| Title of display | PARAMETER (USER, LINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">E18</td><td colspan="2">Override in case of the overall width cutting for pocket-machining</td><td rowspan="4">Override value of feedrate when the pocket-machining radial depth-of-cut becomes equal to the tool diameter<br>Example:<br>  <br><br>MPL036<br>Note:<br>Overriding for overall width cutting is not valid when this parameter is 0.<br>[Applicable units]<br>Rough-machining of POCKET</td></tr>
<tr><td>Unit</td><td>10%</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">E21</td><td colspan="2">Overlapping depth during wall cutting in a closed pattern</td><td rowspan="4">Denote the depth of overlapping between the starting and ending positions of wall cutting in a closed line- or plane-machining pattern.<br>Example:<br>  <br><br>MPL037<br>[Applicable units]<br>- LINE OUT, LINE INE, CHMF OUT and CHMF IN<br>- Wall finishing of E-MIL and SLOT.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inch</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

| Title of display | PARAMETER (USER, LINE) |
|---|---|

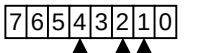
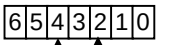
| Address | Meaning | | Description |
|---|---|---|---|
| **E92** | Tool-path pattern selection for pocket milling unit | |  |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

| Title of display | PARAMETER (USER, LINE) |
|---|---|

| Address | Meaning | Description |
|---|---|---|
| **E95** | Tool-path pattern selection for line-machining unit | 7 6 5 4 3 2 1 0<br>For the 2nd and subsequent rounds of cutting:<br>0: Not via the approach point<br>1: Via the approach point<br>For the 2nd and subsequent rounds of cutting:<br>0: Escape to the axis initial point<br>1: No escape on the axis<br>1: Rapid feed up to the intended surface + **U3** to **U6**<br>1: Escape is set to a point where the tool comes out of the removal allowance.<br>The referential point height for central, right hand, left hand, outside and inside linear machining is:<br>0: Set always as **U3** to **U6**<br>1: Set as **E7** or **U3** to **U6** when there is or isn't pre-machining in the same unit, respectively.<br>The plane direction clearance for outside and inside linear machining is:<br>0: Set always as **U10**<br>1: Set as **E5** or **U10** when there is or isn't pre-machining in the same unit, respectively.<br>- Bit 2<br>  <br><br>- Bit 3<br>  <br><br>- Bit 5<br>  <br><br>**Note:**<br>Bit 3 valid only for inside/outside linear machining unit. |

| | |
|---|---|
| Unit | — |
| Effective condition | Instant |
| Applicable program | M |

| Title of display | PARAMETER (USER, LINE) |
|---|---|

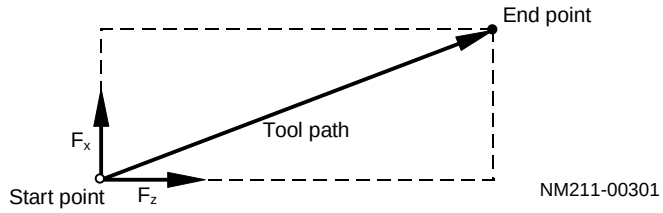
| Address | Meaning | | Description |
|---|---|---|---|
| **E96** | Tool-path pattern selection for end milling-slot unit | |  <br>0: The referential point height is set always as **U3** to **U6**.<br>1: The referential point height is set as **E7** or **U3** to **U6** when there is or isn't pre-machining in the same unit, respectively.<br>For the 2nd and subsequent rounds of cutting:<br>0: Not via the approach point<br>1: Via the approach point<br>1: Rapid feed up to the intended surface + **U3** to **U6** |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **E97** | Tool-path pattern selection for end milling-top unit | |  <br>0: The referential point height is set always as **U3** to **U6**<br>1: The referential point height is set as **E7** or **U3** to **U6** when there is or isn't pre-machining in the same unit, respectively.<br>1: Rapid feed up to the intended surface + **U3** to **U6** |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |

## 3-7 PARAMETER (MACHINE, CONTROL A)

### MACHINE PARAMETER of control axis A group

Data related to the axes is to be set in MACHINE parameter adresse A.

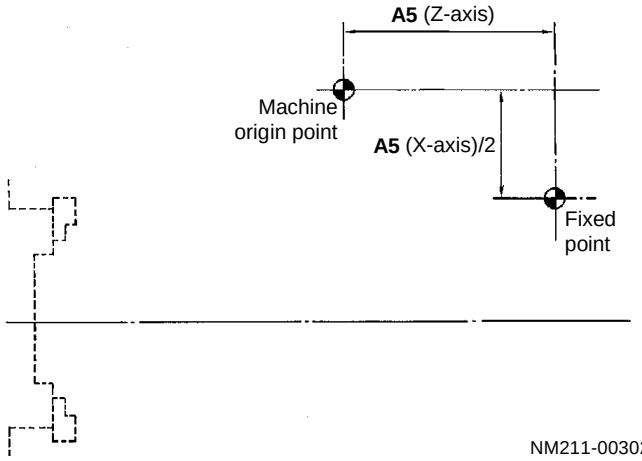
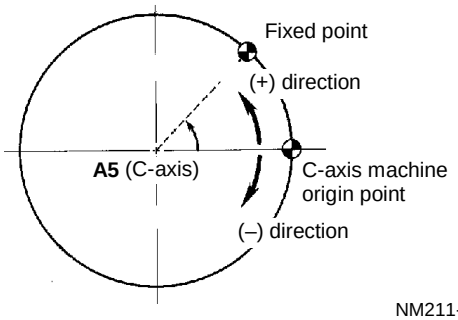
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **A1** | Maximum rapid traverse speed | | Traverse speed for each axis is set.<br>For positioning (straight line positioning) by use of interpolation, positioning feed speed must be the maximum value within the limit data set for this parameter in any axis.<br>**Example:**<br>  <br><br>NM211-00301<br>Feed speed for each axis will be determined according to vector from start point to end point.<br>Fx or Fz will be corresponding to data set for this parameter, and remaining will be determined according to vector quantity. |
| | Unit | mm/min (0.1 inches/min) or deg/min | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **A2** | Clamping value for the cutting feedrate during tool tip point control | | Set the maximum feedrate for the cutting feedrate during tool tip point control.<br>- If the setting of this parameter is “0”, the program will operate with parameter **A1**. |
| | Unit | mm/min (0.1 inches/min) or deg/min | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **A3** | Origin return speed | | Rapid traverse in manual mode (origin return mode, rapid traverse mode) will be made at speed set for this parameter. |
| | Unit | mm/min (0.1 inches/min) or deg/min | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

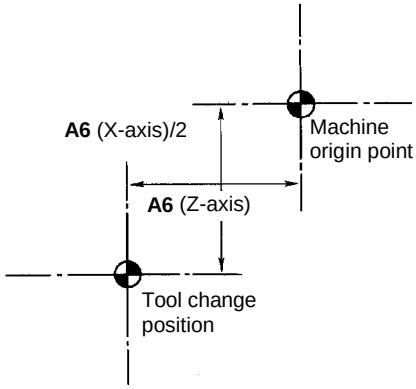
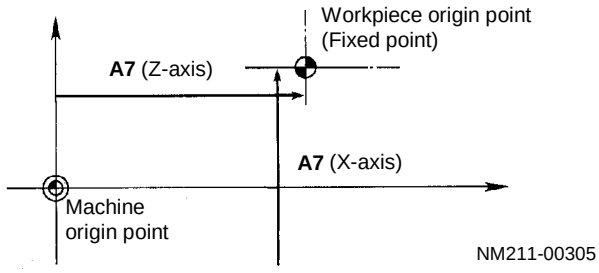
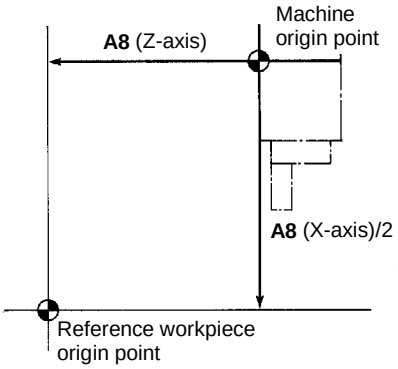
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **A4** | Cutting feedrate clamp value<br>Thread chamfering feedrate | | Setting of maximum C axis feedrate in milling line machining unit (LCT, RGT, LFT) and polar coordinate interpolation mode (G12.1) in EIA/ISO programs.<br>Set the chamfering feedrate for the threading cycle. If 0 is set here, the machine will operate at one-fourth of the setting of parameter **A1**. |
| | Unit | mm/min (0.1 inches/min) or deg/min | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

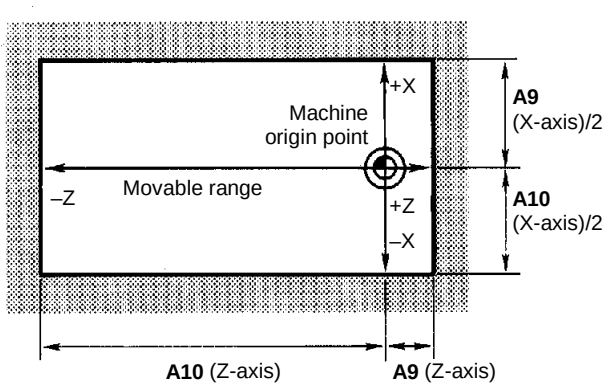
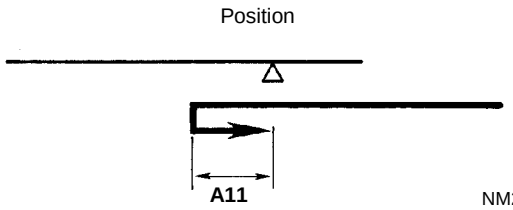
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **A5** | Fixed point return position or second reference point return position | | (1) X-axis (diametral value), Z-axis<br>Specifying fixed point position.<br>Coordinates are determined on the machine coordinate system based on the origin points as reference.<br>  <br><br>NM211-00302<br>(2) C-axis<br>Specifying fixed point position<br>Coordinates are based on the deviation angle from the C-axis machine origin point.<br>  <br><br>NM211-00303 |
| | Unit | 0.001 mm (0.0001 inches) or 0.001 deg | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

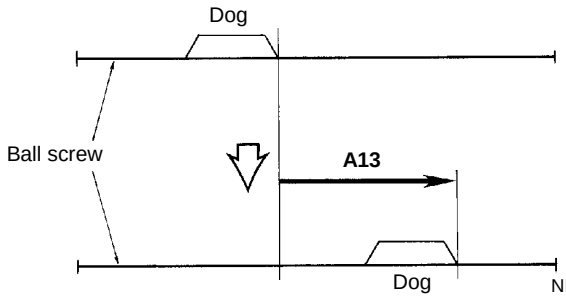
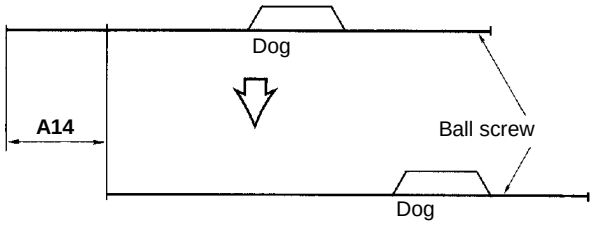
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">A6</td><td colspan="2">Tool tip measurement tool change position or third reference point return position in X-axis (diametral value), Z-axis Setting tool tip measurement tool change position on the machine coordinate system</td><td rowspan="4">Setting tool tip measurement tool change position on the machine coordinate system<br>  <br><br>NM211-00304</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A7</td><td colspan="2">Workpiece origin (fixed point) coordinate or fourth reference point return position</td><td rowspan="4">Setting workpiece origin point position with respect to machine origin point on the machine coordinate system<br>  <br><br>NM211-00305<br>(This parameter determines workpiece origin point upon power on. This can be changed by G50 command.)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">A8</td><td colspan="2">Machine reference position</td><td rowspan="4">Setting reference workpiece origin point position with respect to machine origin point<br>  <br><br>NM211-00306</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

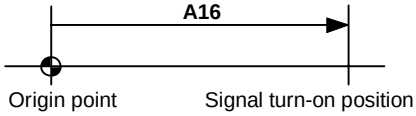
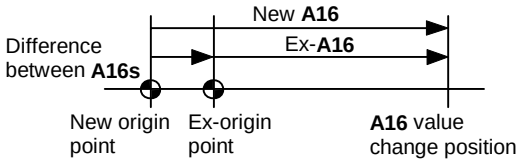
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">A9</td><td colspan="2">Soft limit upper end</td><td rowspan="8">Setting movable range of each axis in (–) and (+) directions from machine origin point<br> 
<br>NM211-00307<br>- If the upper-limit value (A9) and lower-limit value (A10) for the axis are 0 or the same, the soft-limits for that axis are invalid.<br>- Specify the required data to make the illegal axis area upper limit (A29)/lower limit (A30) valid.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A10</td><td colspan="2">Soft limit lower end</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A11</td><td colspan="2">Single direction positioning shift distance</td><td rowspan="4">Setting of shift distance in single direction positioning<br> 
<br>NM211-00308</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A12</td><td colspan="2">Handle interruption clamp data</td><td rowspan="4">Maximum data for handle interruption is set.<br>Diametral value is used for X-axis.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

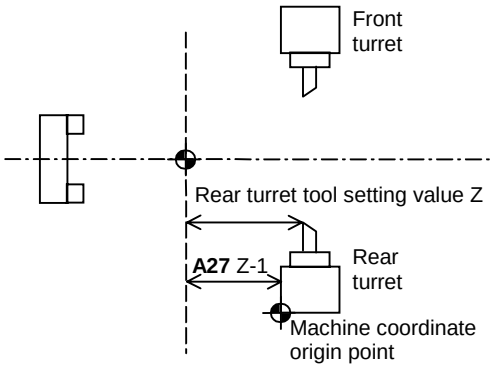
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **A13** | Origin point dog shift distance | | Setting shift distance of origin point dog<br>  <br><br>NM211-00309<br>Diametral value is used for X-axis. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **A14** | Machine position shift distance | | Setting shift distance of machine position<br>  <br><br>NM211-00310<br>Diametral value is used for X-axis. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **A15** | Floating reference point | | Set the machine coordinates of floating reference point.<br>**Example:**<br>`G30.1 X10. Z10.;`<br>With this command, the tool moves past a middle point of X10. Z10 and then moves at rapid feedrate to the floating reference point that has been set in this parameter. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | E | |

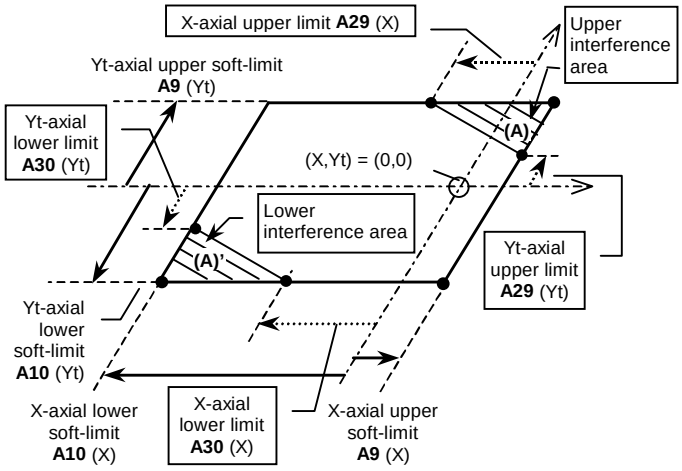
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

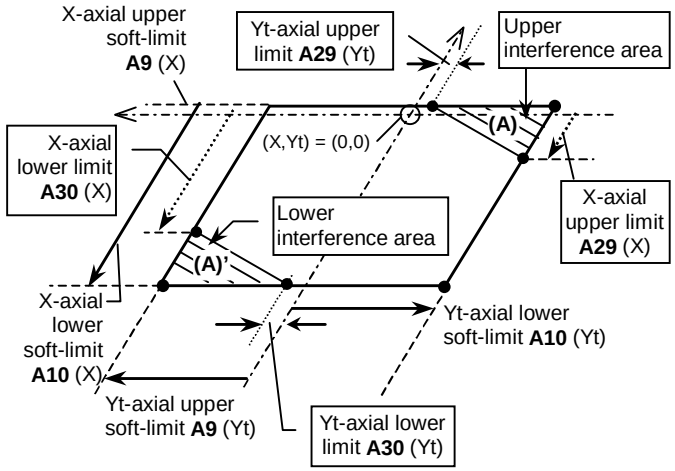
| Address | Meaning | | Description |
|---|---|---|---|
| **A16** | Amount of watchdog-less origin shift | | Shift the specified watchdog-less origin through the specified distance.<br><If the axis is not yet returned to its home position><br>  <br><br><If the axis is already returned to its home position><br>  <br> |
| | Unit | 0.001 mm/0.0001 inch/ 0.001 deg | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **A17** | Feed-forward gain | | Specify the pre-interpolation acceleration/deceleration feed-forward gain levels for each axis. |
| | Unit | % | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **A18 (bit 0)** | Selection of a linear-type rotational axis | | Select whether the rotational axis is of the linear type or the rotational type(this selection is to be made for each axis.)<br>**A18** (bit 0) = 0 : Rotational type<br>**A18** (bit 0) = 1 : Linear type |
| | Unit | — | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">A18<br>(bit 1)</td><td colspan="2">Selection as to how to determine the rotational direction of the rotational axis</td><td rowspan="4">Select how to determine the rotational direction of the rotational axis.<br><br>A18 (bit 1) = 0<br>Rotation based on program-specified codes<br><br>A18 (bit 1) = 1<br>Shortcut rotation</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A25<br>A26</td><td colspan="2">Upper/lower limit setting as stored stroke limits II</td><td rowspan="4">Set the upper and lower limits as stored stroke limits II.<br>A25: Upper limit<br>A26: Lower limit</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>After traveling stop</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A27</td><td colspan="2">Rear-turret machine coordinate origin (Dual-turret specs. only)</td><td rowspan="4">Set the machine coordinate origin for the rear turret.<br> 
</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>After traveling stop</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

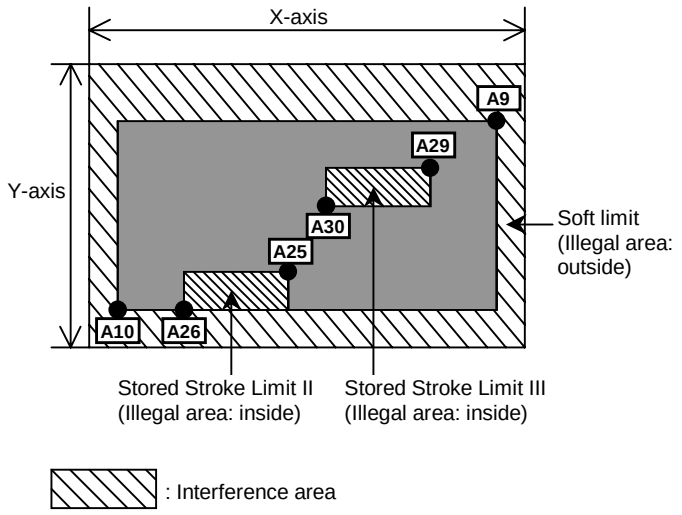
| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

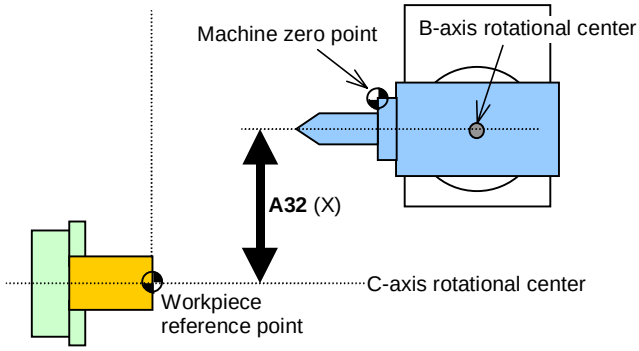
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">A29</td><td colspan="2">Illegal axis area upper limits (Type A)</td><td rowspan="4"> 

<table>
<tr><td>Upper:</td><td>Shaded area (A) in the above diagram, determined by parameters A9 (X), A9 (Yt), A29 (X), and A29 (Yt), is referred to as the illegal axis area.<br>An alarm will result if an attempt is made to move the machine into the area.</td></tr>
<tr><td>Lower:</td><td>Shaded area (A)' in the above diagram, determined by parameters A10 (X), A10 (Yt), A30 (X), and A30 (Yt), is referred to as the illegal axis area.<br>An alarm will result if an attempt is made to move the machine into the area.</td></tr>
</table>
- Parameters A29 and A30 are valid only for the X-axis and the Yt-axis.<br>- If the X-axial and Yt-axial upper limits (A29) and lower limits (A30) are all zeros, the illegal axis area check function is invalid.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A30</td><td colspan="2">Illegal axis area lower limits (Type A)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A29</td><td colspan="2">Illegal axis area upper limits (Type B)</td><td rowspan="4"> 

<table>
<tr><td>Upper:</td><td>Shaded area (A) in the above diagram, determined by parameters A9 (X), A10 (Yt), A29 (X), and A29 (Yt), is referred to as the illegal axis area.<br>An alarm will result if an attempt is made to move the machine into the area.</td></tr>
<tr><td>Lower:</td><td>Shaded area (A)' in the above diagram, determined by parameters A10 (X), A9 (Yt), A30 (X), and A30 (Yt), is referred to as the illegal axis area.<br>An alarm will result if an attempt is made to move the machine into the area.</td></tr>
</table>
- Parameters A29 and A30 are valid only for the X-axis and the Yt-axis.<br>- If the X-axial and Yt-axial upper limits (A29) and lower limits (A30) are all zeros, the illegal axis area check function is invalid.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A30</td><td colspan="2">Illegal axis area lower limits (Type B)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (MACHINE, CONTROL) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">A29</td><td colspan="2">Illegal axis area upper limits (Type C)<br>(Stored Stroke Limit III, upper limit)</td><td rowspan="8"> 

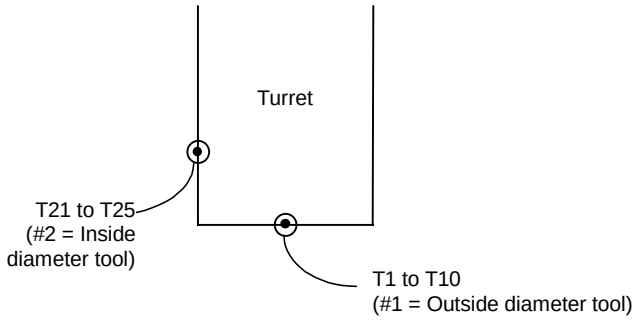
<br>: Interference area</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A30</td><td colspan="2">Illegal axis area lower limits (Type C)<br>(Stored Stroke Limit III, lower limit)</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A31</td><td colspan="2">—</td><td rowspan="4">Fixed (0)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">A32</td><td colspan="2">X-axial distance from the center of the B-axis to that of the C-axis at the time of arrival at the home position</td><td rowspan="4">Enter in terms of diameter the X-axial distance from the center of the B-axis to that of the C-axis at the time of arrival at the home position.<br> 
</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

## 3-8 PARAMETER (MACHINE, MACHINE B)

### MACHINE PARAMETER of Machine B group

- The Machine Parameter is found within each head or turret.
- The display of the Machine Parameter is changed by HEAD SELECT key or TURRET SELECT key on the operation panel. In case of there is no description of “no setting for No.2 spindle head”, it is necessary to set for both of No. 1 and No. 2 spindle heads.

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B1<br>B3<br>B5<br>B7<br>B9</td><td colspan="2">Tool head No.<br>B1 - #1<br>B3 - #2<br>B5 - #3<br>B7 - #4<br>B9 - #5</td><td rowspan="4">Tool Nos. are assigned machine by machine.<br>Example:<br>If tool Nos. are assigned as below:<br>  <br><br>Data are set by procedure as below.<br>B1 = 1 (First tool No. of outside diameter tool)<br>B2 = 10 (Number of outside diameter tools)<br>B3 = 21 (First tool No. of inside diameter tool)<br>B4 = 5 (Number of inside diameter tools)</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B2<br>B4<br>B6<br>B8<br>B10</td><td colspan="2">Number of tools<br>B2 - #1<br>B4 - #2<br>B6 - #3<br>B8 - #4<br>B10 - #5</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

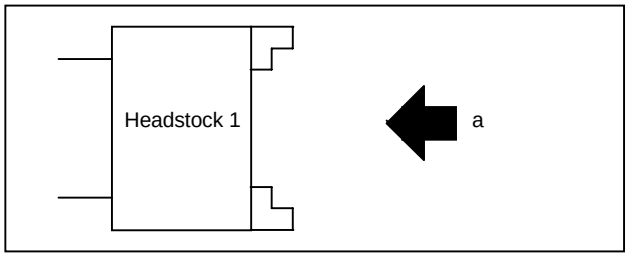
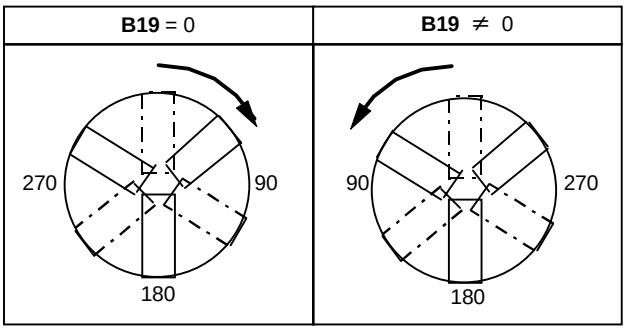
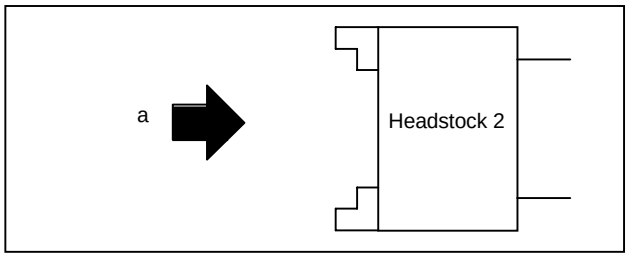
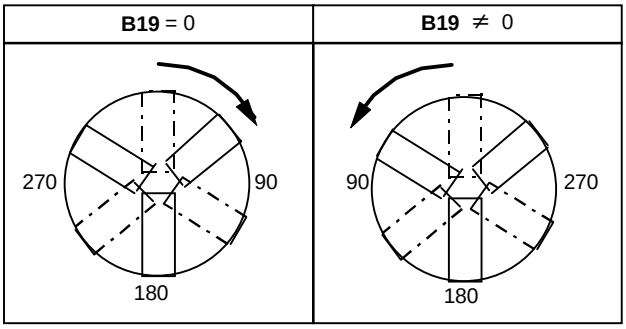
| Address | Meaning | | Description |
|---|---|---|---|
| **B11** | Number of turret pockets | | Number of turret pockets for tool mounting is set. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B14** | Selection of reference tool in updating data method during automatic nose measurement (for EIA) | | See the description of **P14** (bit 7). |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **B15** | Reference tool number | | Designate a reference tool to be used for nose measurement.<br>If a tool is not designated here, the amount of reference tool wear compensation will be “0” in the calculation of compensation data.<br><br><For normal nose measurement><br>a = Target value − Measured value<br>a ≥ 0 Compensation = a – Reference tool wear compensation<br>a < 0 Compensation = a + Reference tool wear compensation<br><br><For a reference tool><br>Compensation = Target value – Measured value<br>Set a suffix as follows: |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B16** | Reference tool suffix | | |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Suffix | None | A | B | C | D | E | F | G | H | V |
|---|---|---|---|---|---|---|---|---|---|---|
| **B16** setting | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

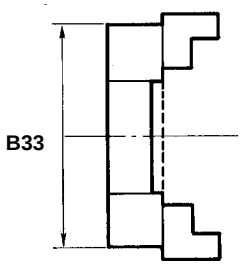
| Address | Meaning | | Description |
|---|---|---|---|
| **B17** | Direction of N° orientation indexing | | Select the direction of indexing for N° orientation.<br>**B17** = 0: Shortcut (other than 1 and 2 below)<br>**B17** = 1: Forward<br>**B17** = 2: Backward |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B18** | Number of pins to be driven for N° orientation | | Set the number of pins to be driven for N° orientation of a machine having an orientation capability. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | Description |
|---|---|---|
| **B19** | Angular direction of spindle orientation | Set the angular direction of orientation of the spindle 1.<br>  <br>When viewed from the direction of the arrow<br>  <br>Set the angular direction of orientation of the spindle on headstock 2.<br>  <br>When viewed from the direction of the arrow<br>  |

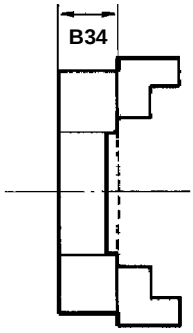
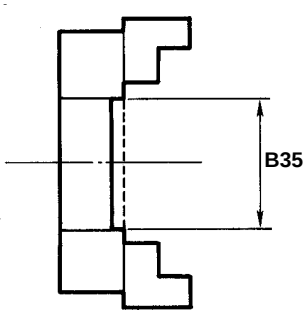
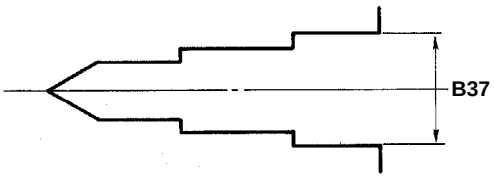
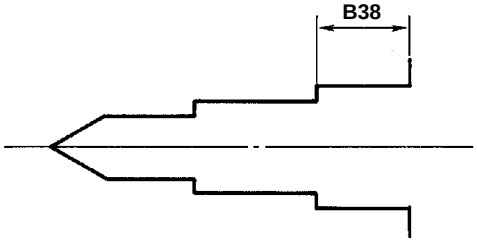
| | |
|---|---|
| Unit | — |
| Effective condition | Power OFF → ON |
| Applicable program | M, E |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

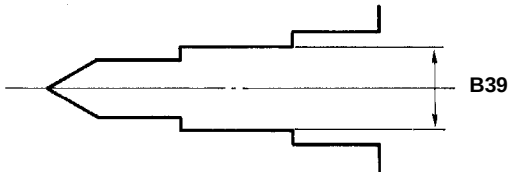
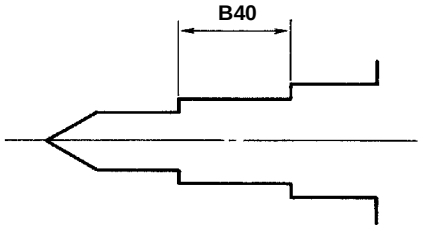
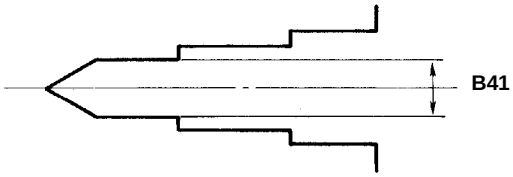
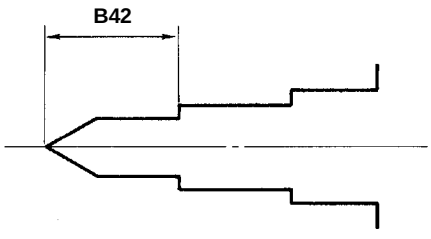
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B29</td><td colspan="2">Selecting Type A/Type B of illegal axis area limits</td><td rowspan="4">Type A or Type B of illegal axis area limits defined with parameters A9, A10, A29 and A30 is selected.<br><br>B29 = 0: Type A of illegal axis area limits is selected.<br>B29 = 1: Type B of illegal axis area limits is selected.<br><br>Note: The illegal axis area check function is only valid when 0 or 1 is set in the parameter B29.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B31</td><td colspan="2">Name of the fourth axis</td><td rowspan="8">Set the name of the axis.<br><br>To display the axis name only at “POSITION”, set the decimal number corresponding to the ASCII code for the axis name which is to be displayed.<br>Example:<br>To display the axis name as ‘W’, enter 87 since a hexadecimal ASCII code of ‘W’ = 0x57 is equivalent to a decimal number of 87.<br><br>To display the axis name at both “POSITION” and “MACHINE”, set the minus decimal number corresponding to the ASCII code for the axis name which is to be displayed.<br>Example:<br>To display the axis name as ‘W’, enter –87 since a hexadecimal ASCII code of ‘W’ = 0x57 is equivalent to a decimal number of 87.</td></tr>
<tr><td>Unit</td><td>ASCII by decimal digit</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B32</td><td colspan="2">Name of the fifth axis</td></tr>
<tr><td>Unit</td><td>ASCII by decimal digit</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B33</td><td colspan="2">Chuck outside diameter (for chuck barrier)</td><td rowspan="4">Setting of chuck outside diameter<br><br> 

NM211-00312<br><br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

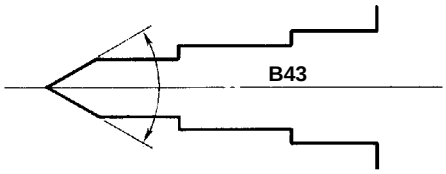
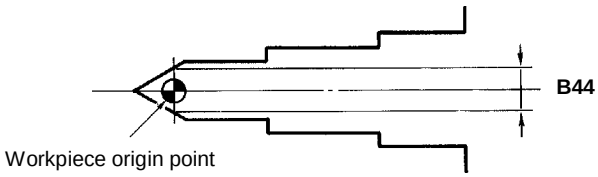
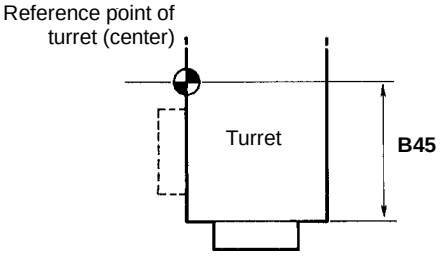
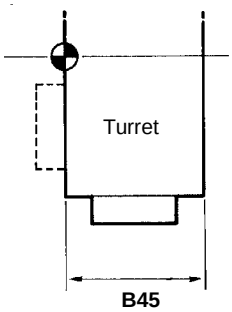
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B34** | Chuck width (for chuck barrier) | | Setting of chuck width<br>  <br><br>NM211-00313<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |
| **B35** | Chuck inside diameter (for chuck barrier) | | Setting of chuck inside diameter<br>  <br><br>NM211-00314<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |
| **B37** | Tail body outside diameter (for tail barrier) | | Setting of tail body outside diameter<br>  <br><br>NM211-00315<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |
| **B38** | Tail body length (for tail barrier) | | Setting of tail body length<br>  <br><br>NM211-00316<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |

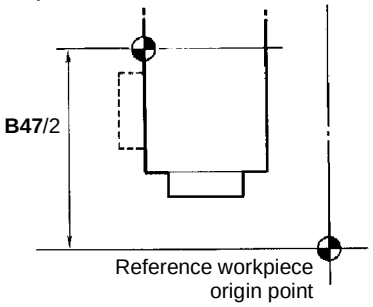
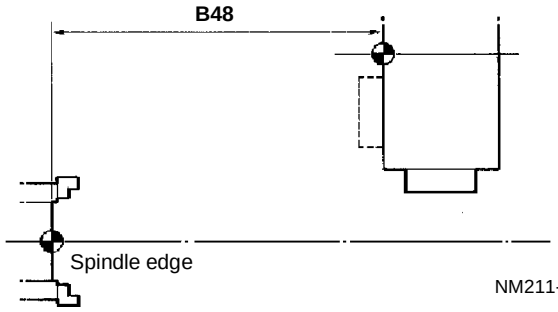
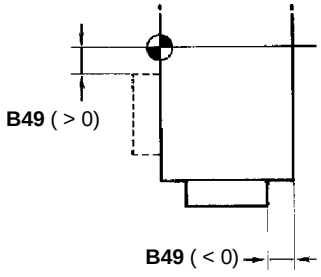
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B39** | Tail spindle outside diameter<br>(for tail barrier) | | Setting of tail spindle outside diameter<br>  <br><br>NM211-00317<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |
| **B40** | Length with tail spindle at back end<br>(for tail barrier) | | Setting of length with tail spindle at back end<br>  <br><br>NM211-00318<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |
| **B41** | Tail head outside diameter<br>(for tail barrier) | | Setting of tail head outside diameter<br>  <br><br>NM211-00319<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |
| **B42** | Tail head length<br>(for tail barrier) | | Setting of tail head length<br>  <br><br>NM211-00320<br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Power<br>OFF → ON | |
| | Applicable program | M, E | |

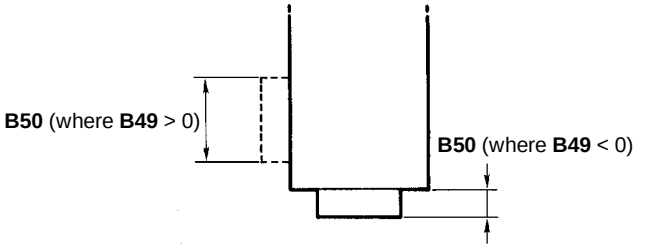
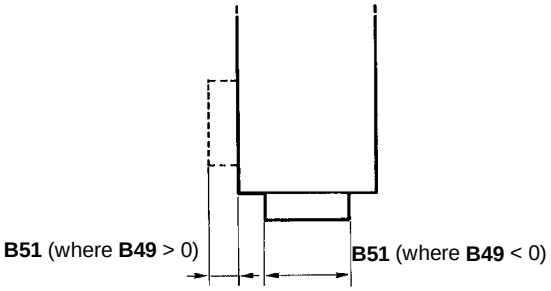
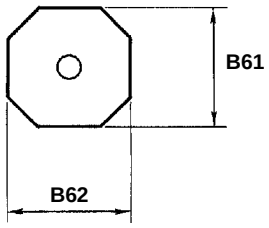
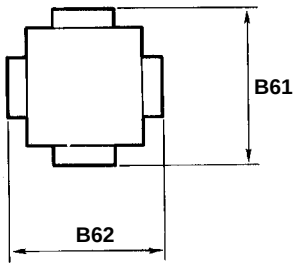
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B43** | Tail head taper angle (for tail barrier) | | Setting of tail head taper angle<br>  <br>NM211-00321 |
| | Unit | 0.001 deg | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B44** | Tail head biting diameter (for tail barrier) | | Setting of biting diameter when tail head is used<br>  <br>NM211-00322 |
| | Unit | 0.001 mm or 0.0001 in. (* 0.0001 mm or 0.00001 in.) | *: The setting unit when the EIA decimal digit adding function is valid |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B45** | Turret radius | | Setting of turret radius<br>  <br>NM211-00323 |
| | Unit | 0.001 mm or 0.0001 in. (* 0.0001 mm or 0.00001 in.) | *: The setting unit when the EIA decimal digit adding function is valid |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B46** | Turret width | | Setting of turret width<br>  <br>NM211-00324 |
| | Unit | 0.001 mm or 0.0001 in. (* 0.0001 mm or 0.00001 in.) | *: The setting unit when the EIA decimal digit adding function is valid |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |

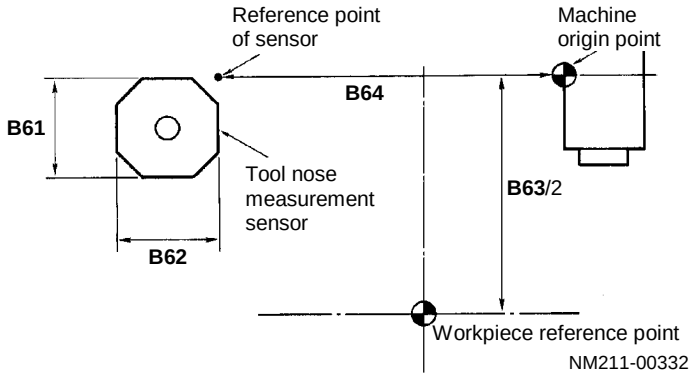
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B47</td><td colspan="2">Turret reference position in X-axis direction</td><td rowspan="4">Turret position when X-axis is returned to machine origin point is set by diametral value.<br>  <br><br>NM211-00325<br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B48</td><td colspan="2">Turret reference position in Z-axis direction</td><td rowspan="4">Turret position when Z-axis is returned to machine origin point is set.<br>  <br><br>NM211-00326<br>*: The setting unit when the EIA decimal digit adding function is valid<br>Note:<br>The display value of B48 at the No. 2 spindle side is the same as that of B72 at the No. 1 spindle side.<br>Do not change the value of B48 at the No. 2 spindle side, except for the MULTIPLEX or DUAL TURN specifications.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B49<br>B52<br>B55<br>B58</td><td colspan="2">Tool holder mounting position<br>B49 - Type 1<br>B52 - Type 2<br>B55 - Type 3<br>B58 - Type 4</td><td rowspan="4">Setting of tool holder mounting position. When plus data is used, the tool holder is mounted horizontally, and minus data downward.<br>Example: Type 1<br>  <br><br>NM211-00327<br>Same for types 2, 3, 4</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

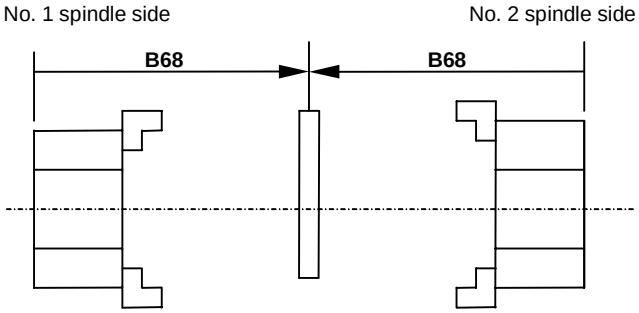
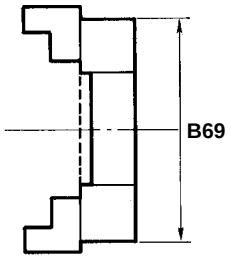
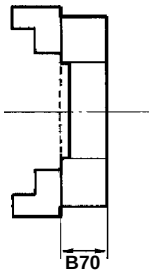
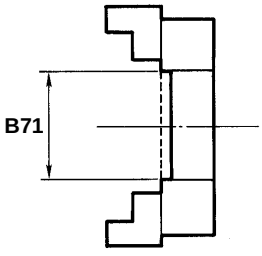
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B50<br>B53<br>B56<br>B59</td><td colspan="2">Tool holder width in X-axis direction<br>B50 - Type 1<br>B53 - Type 2<br>B56 - Type 3<br>B59 - Type 4</td><td rowspan="4">Setting tool holder width in X-axis direction<br>Example: Type 1<br>  <br><br>NM211-00328<br>Same for types 2, 3, 4</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B51<br>B54<br>B57<br>B60</td><td colspan="2">Tool holder width in Z-axis direction<br>B51 - Type 1<br>B54 - Type 2<br>B57 - Type 3<br>B60 - Type 4</td><td rowspan="4">Setting of tool holder width in Z-axis direction<br>Example: Type 1<br>  <br><br>NM211-00329<br>Same for types 2, 3, 4</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B61</td><td colspan="2">Tool nose measurement sensor width in X-axis direction</td><td rowspan="8">Tool nose measurement sensor dimensions are set.<br>Example 1:<br>RENISHAW touch sensor<br>  <br><br>NM211-00330<br>Example 2:<br>MT pulsar<br>  <br><br>NM211-00331</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B62</td><td colspan="2">Tool nose measurement sensor width in Z-axis direction</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

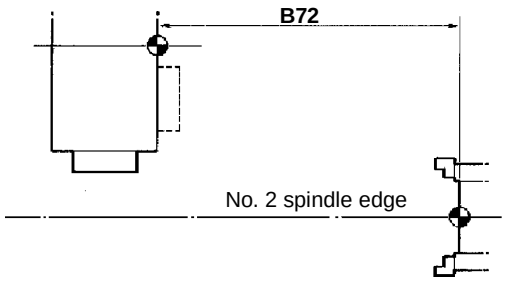
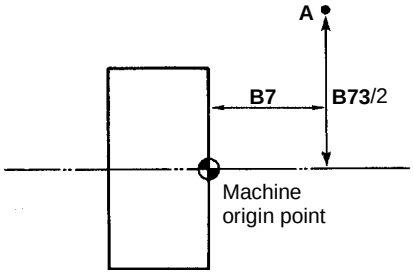
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B63</td><td colspan="2">Tool nose measurement sensor mounting position, X-axis (diametral value)</td><td rowspan="4">Setting of sensor reference point coordinates<br>The Z coordinate on the machine coordinate system and the X coordinate on the reference workpiece coordinate system are set for parameter B64 and B63 respectively.<br>Tool nose measurement sensor reference point is positioned as shown below.<br>Example:<br>No. 1 spindle head side<br>  <br><br>Note:<br>The tool nose measurement sensor reference point for No. 2 spindle head must be positioned above left of the sensor.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B64</td><td colspan="2">Tool nose measurement sensor mounting position, Z-axis</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B66</td><td colspan="2">Workpiece measurement sensor diameter compensation data for outside diameter measurement and projection width measurement</td><td rowspan="4">Values set for these parameters are used to calculate measurement data.<br>Outside diameter measurement<br>$Ax = \left| \frac{\#1 - \#2}{2} \right| - 2R + \mathbf{B66}$<br>Projection width measurement<br>$Az = \left| \#1 - \#2 \right| - 2R + \mathbf{B66}$<br>Inside diameter measurement<br>$Ax = \left| \frac{\#1 - \#2}{2} \right| + 2R + \mathbf{B67}$<br>Groove width measurement<br>$Az = \left| \#1 - \#2 \right| + 2R + \mathbf{B67}$<br>$A_x/A_Z$ : Measurement data<br>#1/#2 : Sensor ON position<br>R : Touch sensor nose R<br>Notes:<br>1. When the parameter B66 is not set (or set to 0), the value of parameter B235 is used for projection width measurement (WID OUT and WID IN).<br>2. When the parameter B67 is not set (or set to 0), the value of parameter B236 is used for groove width measurement (GRV OUT and GRV IN).</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B67</td><td colspan="2">Workpiece measurement sensor diameter compensation data for inside diameter measurement and groove width measurement</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

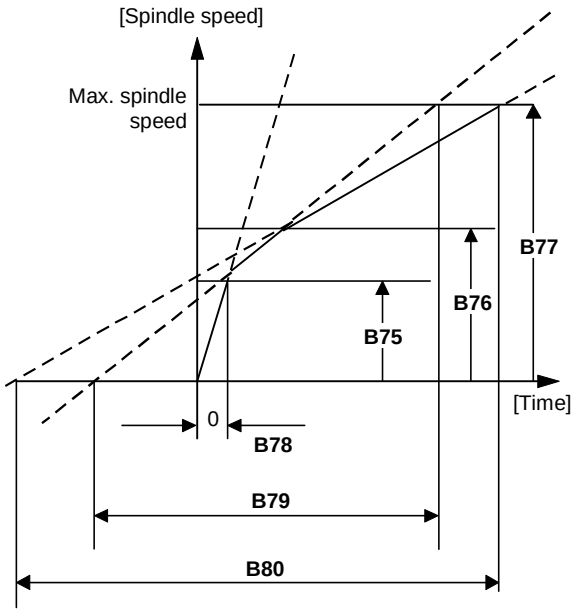
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B68** | Position of separating plate | | The position of separating plate viewed from spindle nose is specified.<br>  |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B69** | Chuck outside diameter of No. 2 spindle (for chuck barrier) | | Setting of chuck outside diameter of No. 2 spindle<br>  <br>NM211-00312<br>**Note:**<br>For MULTIPLEX and DUAL TURN specs., the same value as **B33** for the No. 2 spindle is displayed. Do not change this setting value. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B70** | Chuck width of No. 2 spindle (for chuck barrier) | | Setting of chuck width of No. 2 spindle<br>  <br>NM211-00313<br>**Note:**<br>For MULTIPLEX and DUAL TURN specs., the same value as **B34** for the No. 2 spindle is displayed. Do not change this setting value. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B71** | Chuck inside diameter of No. 2 spindle (for chuck barrier) | | Setting of chuck inside diameter of No. 2 spindle<br>  <br>NM211-00314<br>**Note:**<br>For MULTIPLEX and DUAL TURN specs., the same value as **B35** for the No. 2 spindle is displayed. Do not change this setting value. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B72</td><td colspan="2">Z-coordinate of tool post reference position with respect to No. 2 spindle edge</td><td rowspan="4">Setting of position when Z-axis is returned to machine origin point.<br>  <br><br>NM211-00326<br>Note:<br>The display value of B72 at the No. 1 spindle side is the same as that of B48 at the No. 2 spindle side.<br>Do not change the value of B72 at the No. 1 spindle side, except for the MULTIPLEX or DUAL TURN specifications.</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B73</td><td colspan="2">X-coordinate of tool path start point on the TOOL PATH CHECK display</td><td rowspan="4">The start point of a tool path drawn on the TOOL PATH CHECK display is set by a coordinate value of machine coordinate system.<br>  <br><br>A: Tool path start point<br>NM211-00334<br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B74</td><td colspan="2">Z-coordinate of tool path start point on the TOOL PATH CHECK display</td><td rowspan="4">Refer to B73.<br><br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

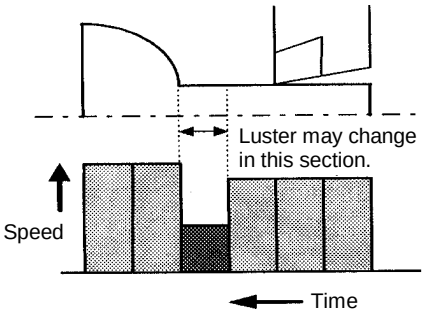
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

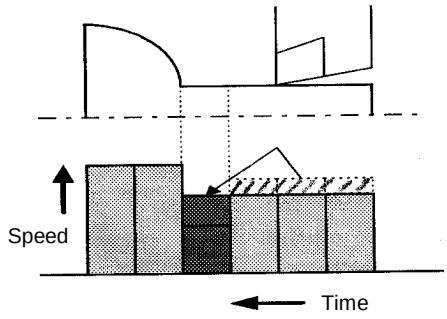
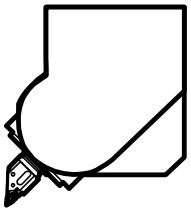
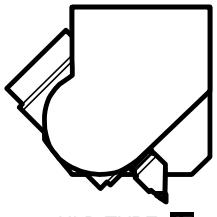
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B75<br>B76<br>B77</td><td colspan="2">Spindle limit speed selection for spindle position control time constants<br>B75 - Limit speed 1<br>B76 - Limit speed 2<br>B77 - Limit speed 3</td><td rowspan="8">Set the spindle limit speed at which the time constant for the spindle position control is to be changed<br> 
</td></tr>
<tr><td>Unit</td><td>Revolution</td></tr>
<tr><td>Effective condition</td><td>Power OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B78<br>B79<br>B80</td><td colspan="2">Spindle position control time constants<br>B78 - Time constant 1<br>B79 - Time constant 2<br>B80 - Time constant 3</td></tr>
<tr><td>Unit</td><td>0.001 sec</td></tr>
<tr><td>Effective condition</td><td>Power OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B81</td><td colspan="2">EIA barrier activation</td><td rowspan="4">Set the types of tailstock, tool holder and chuck for which the EIA barriers are to be activated.<br>Tailstock..... Off/On (see Note 1 below) 0/1<br>Tool holder..... Unset/Set 0/2<br>Main chuck..... Outer/Inner Jaw 0/4<br>Sub-chuck..... Outer/Inner Jaw 0/8<br>G22/G23 ..... Inside/Outside (see Note 2 below) 0/64<br>For example, if Tailstock Off, Tool holder Set, Main chuck Inner jaw, and Sub-chuck Inner jaw are to be specified, then set 14 in B81 since the total value becomes (0+2+4+8=14).<br>Notes:<br>1. “Tailstock off” does not mean cancelling the tail barriers; it means that the tail will move away prior to machining.<br>2. Refer to the EIA/ISO Programming Manual for further details of G22/G23.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

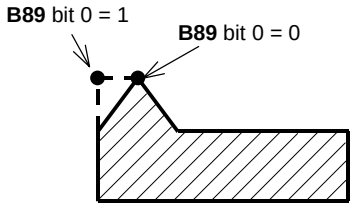
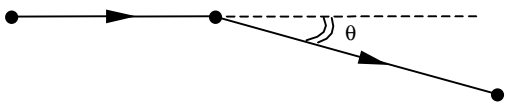
| Address | Meaning | | Description |
|---|---|---|---|
| **B82** | M-code for spindle forward rotation during a fixed hole-drilling cycle | | Set the M-code to be used to rotate the spindle in its forward direction during a fixed hole-drilling cycle.<br>If 0 is set here, the M-code will be regarded as M03. |
| | Unit | — | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | E | |
| **B83** | M-code for spindle reverse rotation during a fixed hole-drilling cycle | | Set the M-code to be used to rotate the spindle in its reverse direction during a fixed hole-drilling cycle.<br>If 0 is set here, the M-code will be regarded as M04. |
| | Unit | — | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | E | |
| **B84** | Whether to activate T-command pre-reading, whether to display tailstock information, whether to activate stand-by M code pre-reading, whether to pre-read the block immediately succeeding the M00/M01 code, whether to make bar feeder schedule function valid/invalid, whether to make the NC powered tailstock valid, and selection of whether to display tail thrust in pounds (lbs) | | Select whether T-command pre-reading is to be made valid and whether tailstock-related infromation is to be dispalyed on the **SET UP** display.<br>T-command pre-reading Yes/No 0/1<br>Display of tailstock information No/Yes 0/2<br>Stand-by M code pre-reading No/Yes 0/4<br>Pre-reading the block immediately succeeding the M00/M01 code Yes/No 0/8<br>Bar feeder schedule function Invalid/Valid 0/16<br>NC powered tailstock function Invalid/Valid 0/32<br>Display of tail thrust also in pounds (lbs) No/Yes 0/64<br>**Example:**<br>If T-command pre-reading is not required and tailstock information is to be displayed, set 3 since the total value becomes (1 + 2 = 3).<br>**Notes:**<br>**1.** If the machine has ATC, set the value 1 for T-command pre-reading.<br>**2.** To make the NC powered tailstock function valid, also make the display of tailstock information valid. |
| | Unit | — | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

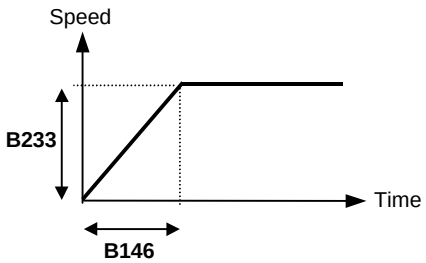
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B85</td><td colspan="2">Selection of the feed unit at block connections</td><td rowspan="4">Select this function if luster of about 1 mm (0.04 in.) luster on the as-cut surface becomes a problem at block connections, for example, for a linear-to-arc pattern change.<br><br>B85 (bit 0) = 0<br>Under linear-to-arc cutting conditions (with no changes in speed), linear-to-linear cutting conditions (with changes in speed), and linear-to-arc cutting conditions (with changes in speed), the cutting speed may fluctuate in the linear blocks.<br><br>B85 (bit 0) = 1 (no speed fluctuations in linear blocks)<br>Under linear-to-arc cutting conditions (with no changes in speed), linear-to-linear cutting conditions (with changes in speed), and linear-to-arc cutting conditions (with changes in speed), the cutting speed does not fluctuate in the linear blocks.<br><br>B85 bit 0 = 0<br> 

<br>B85 bit 0 = 1<br> 
</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B86</td><td colspan="2">Holder angle of angle tool holder</td><td rowspan="4">Set the holder angle of the angle tool holder.<br>According to the value set in this parameter, the holder angle is set in HLD.TYPE on the TOOL DATA display.<br>B86 = 45<br> 
HLD.TYPE: 45<br>(B86 = 45)<br> 
HLD.TYPE: 45<br>(180 – B86 = 135)</td></tr>
<tr><td>Unit</td><td>Degree</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B89** | Selection of the solid-mode threading tool nose position | | Specify the solid-mode threading tool nose position.<br>**P89** (bit 0) = 0 (Conventional method)<br>The sharp section of the threading tool is recognized as its nose.<br>**P89** (bit 0) = 1<br>The tool-setting point is recognized as the tool nose.<br>  |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B107** | Angle of pre-interpolation corner deceleration | | Specify the angle of deceleration at corners.<br>If 0 is entered, the angle will be handled as 5 degrees.<br>If a value exceeding 90 degrees is entered, the angle will be handled as 30 degrees.<br>  |
| | Unit | Degree | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B108** | Reference axis for polygonal machining | | Specify the axis number of the spindle (workpiece axis) to be used as a reference axis for polygonal machining. |
| | Unit | Number of controlled axis | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | E | |
| **B109** | Spindle number for milling-spindle synchronous tapping | | Set the identification number of the spindle for milling-spindle synchronous tapping.<br>**B109** = 7<br>For spindle rotary switch 2<br>**B109** = 0<br>For spindle rotary switch 6 |
| | Unit | Number of controlled axis | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |

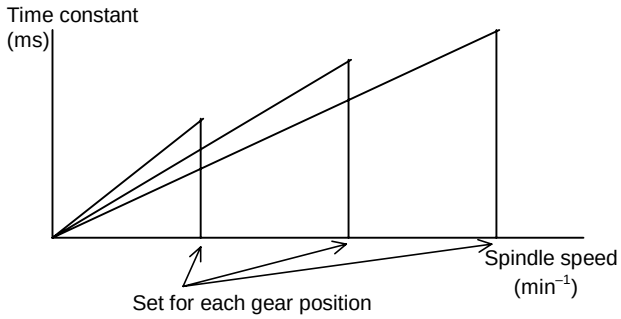
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B110** | Axis control flag for a machine having a high-speed turret | | Set the axis control flag for a machine having both a high-speed turret and No. 2 spindle.<br><br>**B110** = 1<br>For machine having both a high-speed turret and No. 2 spindle<br><br>**B110** = 0<br>For other machines |
| | Unit | — | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B112** | S-shaped acceleration/deceleration filtering | | Specify the length for S-shaped acceleration/deceleration filtering of the shape correction function.<br>0: No filtering<br>1: 14.2 msec<br>2: 28.4 msec<br>4: 56.8 msec<br>8: 113.6 msec<br><br>**Note:**<br>If a value other than the above is entered, the filtering length will be regarded as 14.2 msec. |
| | Unit | — | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B145** | Dwell time during the C-axis unclamping mode in a fixed hole-drilling cycle | | Set the dwell time to be secured during the C-axis unclamping mode in a fixed hole-drilling cycle. |
| | Unit | msec | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B146** | Pre-interpolation acceleration/deceleration: Time constant | | Set the time constant as the time up to the arrival of the target pre-interpolation acceleration/deceleration speed specified in parameter **B233**.<br>  <br> |
| | Unit | msec | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B147** | Maximum cutting speed in shape correction mode | | Set the maximum cutting speed in shape correction mode. |
| | Unit | mm/min or 0.1 inches/min | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B148** | Feedrate during measurement for automatic tool offsetting | | Set the feedrate during measurement for automatic tool offsetting. |
| | Unit | mm/min | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **B149**<br>**B150**<br>**B151** | Rapid feed overriding data | | Set the rapid feed overriding data:<br>100%<br>↓ ↑<br>50%<br>↓ ↑<br>**B149**%<br>↓ ↑<br>**B150**%<br>↓ ↑<br>**B151**% |
| | Unit | % | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B152** | Minimum index angle of the FLASH-tool | | This parameter is used as the basis for judging whether the index angle entered in TOOL DATA display is acceptable. An alarm will be displayed if the entered value is judged to be unacceptable.<br>(Specify “900” for 4-segment splitting.) |
| | Unit | 0.1 degree | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B153<br>to<br>B160</td><td colspan="2">Maximum spindle speeds for each gear position during a synchronous tapping cycle</td><td rowspan="4">Specify the maximum spindle speeds for each gear position during a synchronous tapping cycle.<br>The following diagram represents the relationship to each synchronous tapping time constants:<br>  <br><br>B153: Maximum spindle speeds setting for each gear position [1]<br>B154: Maximum spindle speeds setting for each gear position [2]<br>B155: Maximum spindle speeds setting for each gear position [3]<br>B156: Maximum spindle speeds setting for each gear position [4]<br>B157: Maximum spindle speeds setting for each gear position [5]<br>B158: Maximum spindle speeds setting for each gear position [6]<br>B159: Maximum spindle speeds setting for each gear position [7]<br>B160: Maximum spindle speeds setting for each gear position [8]</td></tr>
<tr><td>Unit</td><td>min$^{-1}$ (rpm)</td></tr>
<tr><td>Effective condition</td><td>Power OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B161<br>to<br>B168</td><td colspan="2">Critical spindle speeds for each gear position during a synchronous tapping cycle</td><td rowspan="4">Specify the cirtical spindle speeds for each gear position during a synchronous tapping cycle.<br>B161: Critical spindle speeds setting for each gear position [1]<br>B162: Critical spindle speeds setting for each gear position [2]<br>B163: Critical spindle speeds setting for each gear position [3]<br>B164: Critical spindle speeds setting for each gear position [4]<br>B165: Critical spindle speeds setting for each gear position [5]<br>B166: Critical spindle speeds setting for each gear position [6]<br>B167: Critical spindle speeds setting for each gear position [7]<br>B168: Critical spindle speeds setting for each gear position [8]</td></tr>
<tr><td>Unit</td><td>min$^{-1}$ (rpm)</td></tr>
<tr><td>Effective condition</td><td>Power OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B169</td><td colspan="2">Maximum permissible speed of the rotational axis for polygonal/hobbing machining</td><td rowspan="4">If the rotational speed of the tool rotational axis during polygonal machining exceeds the setting of this parameter, that rotational speed will be clamped at this setting.<br>Also, if the rotational speed of the milling axis during hobbing exceeds the setting of this parameter, that rotational speed will be clamped at this setting.</td></tr>
<tr><td>Unit</td><td>min$^{-1}$ (rpm)</td></tr>
<tr><td>Effective condition</td><td>Power OFF → ON</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B170** | Acceleration/deceleration time constant for synchronous tapping | | Set the acceleration/deceleration time constant for synchronous tapping. If 0 is set, the program will operate at a default of 1500 msec. |
| | Unit | msec | |
| | Effective condition | Power OFF → ON | |
| | Applicable program | M, E | |
| **B171** | Spindle 1/4h (1/2h) rated torque for L coils for auto-pecking of the cutting load detection type | | Set the 1/4h (1/2h) rated torque for the L coils of the spindle motor.<br>**Note:**<br>Only the 1/2h rated torque, not the 1/4h rated torque, may be known for the particular motor. If that is the case, set the 1/2h rated torque. |
| | Unit | 0.1 N·m | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B172** | Spindle 1/4h (1/2h) rated torque for H coils for auto-pecking of the cutting load detection type | | Set the 1/4h (1/2h) rated torque for the H coils of the spindle motor.<br>**Note:**<br>Only the 1/2h rated torque, not the 1/4h rated torque, may be known for the particular motor. If that is the case, set the 1/2h rated torque. |
| | Unit | 0.1 N·m | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B173** | Cutting force calculation filter for auto-pecking of the cutting load detection type | | Set the filter for the data which has been sampled at 7.1-msec intervals.<br>If the entered value is “0”, the data actually used will be 4 × 7.1 (msec). |
| | Unit | 7.1 msec | |
| | Effective condition | Instant | |
| | Applicable program | M | |

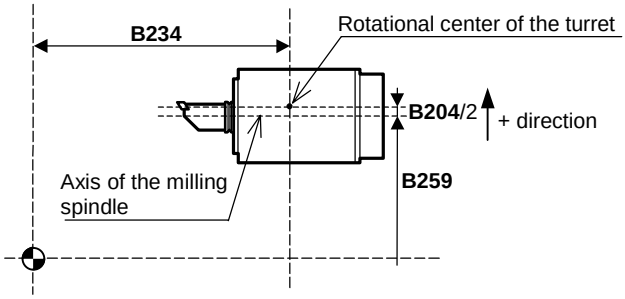
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B176</td><td colspan="2">Linear acceleration/deceleration time constant for thread cutting</td><td>Set the special time constant for linear acceleration and deceleration during thread cutting (by G32).<br>Setting range: 1 to 300 (msec)<br>The normal time constant for linear acceleration and deceleration during linear interpolation (by G01) will be applied instead to thread cutting if the setting of this paramenter is outside the above-mentioned range.</td></tr>
<tr><td>Unit</td><td>msec</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B177<br>to<br>B181</td><td colspan="2">Analog input/output offsets adjustment</td><td>This parameter adjusts the analog output offsets value of DIO cards.<br><table><tr><th>Parameter</th><th>Description</th></tr><tr><td>B177</td><td>Analog output channel 1</td></tr><tr><td>B178</td><td>Analog output channel 2</td></tr><tr><td>B179</td><td>Analog output channel 3</td></tr><tr><td>B180</td><td>Analog output channel 4</td></tr><tr><td>B181</td><td>Analog output channel 5</td></tr></table>Setting for analog output<br>$= \frac{-8191 \times \text{Measured voltage (V)}}{10.56\ \text{(V)}}$<br>No setting for No. 2 spindle head</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

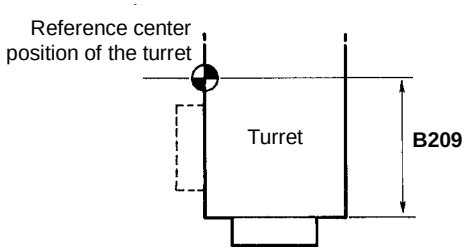
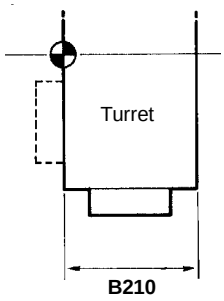
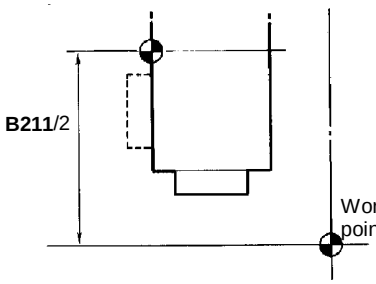
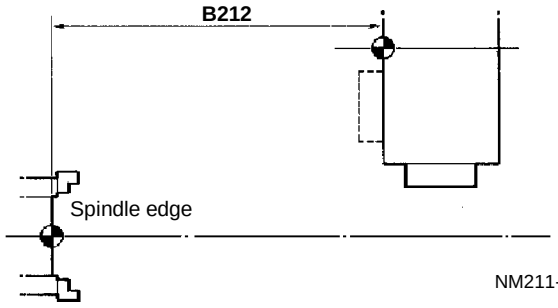
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B182<br>to<br>B186</td><td colspan="2" rowspan="2">Analog output gain</td><td rowspan="4">This parameter adjusts the analog output gain levels of DIO cards (such as DX539).<br><br><table><tr><th>Parameter</th><th>Description</th><th>Corresponding card</th></tr><tr><td>B182</td><td>Analog output channel 1</td><td>First card</td></tr><tr><td>B183</td><td>Analog output channel 2</td><td>Second card</td></tr><tr><td>B184</td><td>Analog output channel 3</td><td>Third card</td></tr><tr><td>B185</td><td>Analog output channel 4</td><td>Fourth card</td></tr><tr><td>B186</td><td>Analog output channel 5</td><td>Fifth card</td></tr></table><br>Setting = $\frac{\text{Correct voltage (V)}}{\text{Measured voltage (V)}} \times 4096$<br><br>No setting for No. 2 spindle head</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B187<br>to<br>B191</td><td colspan="2" rowspan="2">Analog input offsets adjustment</td><td rowspan="4">This parameter adjusts the analog input offsets value of DIO card.<br><br><table><tr><th>Parameter</th><th>Description</th><th>Corresponding card</th></tr><tr><td>B187</td><td>Analog input channel 1</td><td>First card</td></tr><tr><td>B188</td><td>Analog input channel 2</td><td>Second card</td></tr><tr><td>B189</td><td>Analog input channel 3</td><td>Third card</td></tr><tr><td>B190</td><td>Analog input channel 4</td><td>Fourth card</td></tr><tr><td>B191</td><td>Analog input channel 5</td><td>Fifth card</td></tr></table><br>Setting value of analog input = offsetting value<br><br>No setting for No. 2 spindle head</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

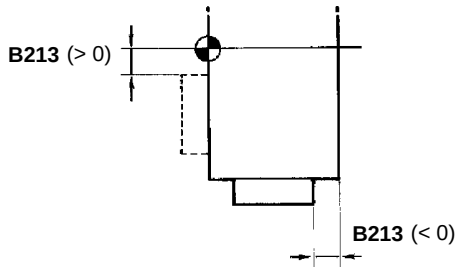
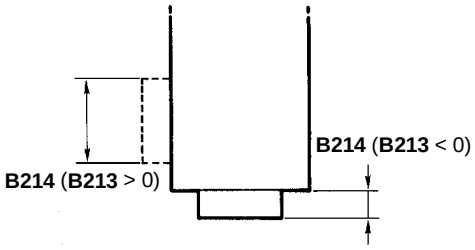
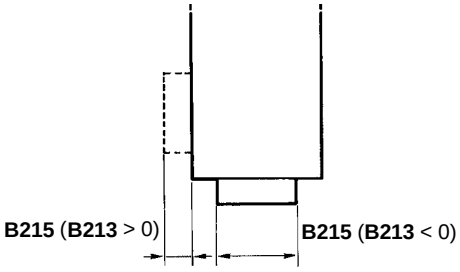
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B200**<br>**B201** | Correction value for tool-setting data auto-setting functions (for ↓ tool) | | Deviations of actual machine from its theoretical data are corrected during tool-setting data auto-setting.<br>Tool-setting X for the tool = Tool-setting X for reference tool + **B200** / A<br>Tool-setting Z for the tool = [Parameter **B234** × (–1) × 2 / A] – (Tool-setting Z for reference tool + **B201** / A)<br>A = 1000 (mm) or 10000 (in.)<br>**B200**: Correction value X,<br>**B201**: Correction value Z<br>**Note:**<br>These parameters are valid only in automatic tool-setting data setting mode for ↓ tools, and they are invalid in other modes. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B202**<br>**B203** | Correction value for tool-setting data auto-setting functions (for ← tool) | | Deviations of actual machine from its theoretical data are corrected during tool-setting data auto-setting.<br>Tool-setting X for the tool = Tool-setting X for reference tool + **B202** / A<br>Tool-setting Z for the tool = [Parameter **B234** × (–1) x 2 / A] – (Tool-setting Z for reference tool + **B203** / A)<br>A = 1000 (mm) or 10000 (in.)<br>**B202**: Correction value X,<br>**B203**: Correction value Z<br>**Note:**<br>These parameters are valid only in automatic tool-setting data setting mode for ← tools, and they are invalid in other modes. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B204** | Turret rotational runout correction value | | This parameter corrects the X-axial offset between the axis of the milling spindle and the rotational center of the turret. This parameter is used when executing the automatic TOOL SET data setting function for the B-axis angle index turning function. (Entry of diametral value)<br>  <br><br>**Note:**<br>This parameter is valid only when the automatic TOOL SET data setting function for the B-axis angle index turning function is executed, and is not valid in any other case. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

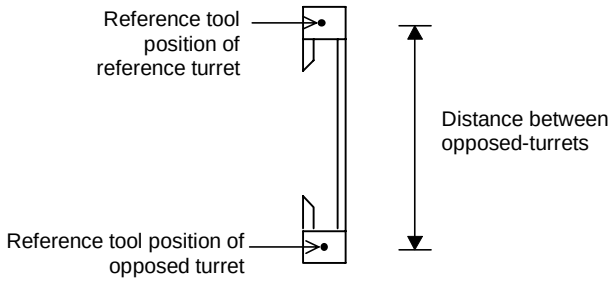
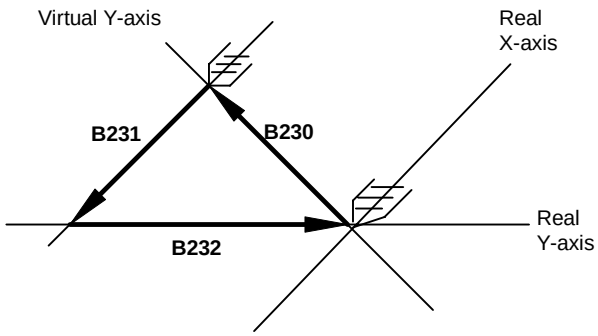
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B209** | Radius of the rear turret (Dual-turret specs. only) | | Set the radius of the rear turret.<br>  <br>NM211-00323 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B210** | Width of the rear turret (Dual-turret specs. only) | | Set the width of the rear turret.<br>  <br>NM211-00324 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B211** | Rear turret reference position – X-coordinate (Dual-turret specs. only) | | Set the distance from the position of the rear turret existing at the machine origin position of the X-axis to the corresponding X-coordinate<br>  <br>NM211-00325 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B212** | Rear turret reference position – Z-coordinate (Dual-turret specs. only) | | Set the distance from the position of the rear turret existing at the machine origin position of the Z-axis to the corresponding Z-coordinate.<br>  <br>NM211-00326 |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

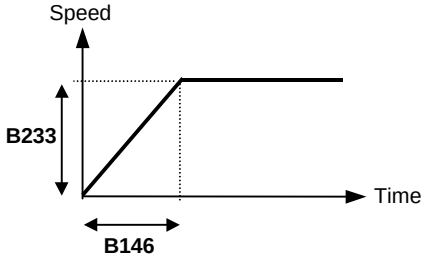
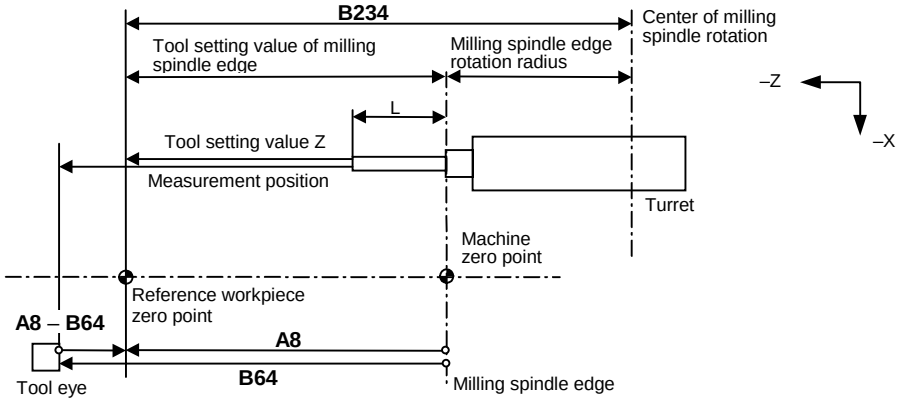
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B213**<br>**B216**<br>**B219**<br>**B222** | Mounting position of the tool holder (Dual-turret specs. only)<br>**B213** – Type 1<br>**B216** – Type 2<br>**B219** – Type 3<br>**B222** – Type 4 | | Set the mounting position of the tool holder for the rear turret.<br>If this value is plus, the holder will face sideways. If the value is minus, the holder will face downward.<br>**Example:** Type 1<br>  <br><br>NM211-00327<br>The above also applies to types 2, 3, and 4. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B214**<br>**B217**<br>**B220**<br>**B223** | X-axial width of the tool holder for the rear turret (Dual-turret specs. only)<br>**B214** – Type 1<br>**B217** – Type 2<br>**B220** – Type 3<br>**B223** – Type 4 | | Set the X-axial width of the tool holder for the rear turret.<br>**Example:** Type 1<br>  <br><br>NM211-00328<br>The above also applies to types 2, 3, and 4. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B215**<br>**B218**<br>**B221**<br>**B224** | Z-axial width of the tool holder for the rear turret (Dual-turret specs. only)<br>**B215** – Type 1<br>**B218** – Type 2<br>**B221** – Type 3<br>**B224** – Type 4 | | Set the Z-axial width of the tool holder for the rear turret.<br>**Example:** Type 1<br>  <br><br>NM211-00329<br>The above also applies to types 2, 3, and 4. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |

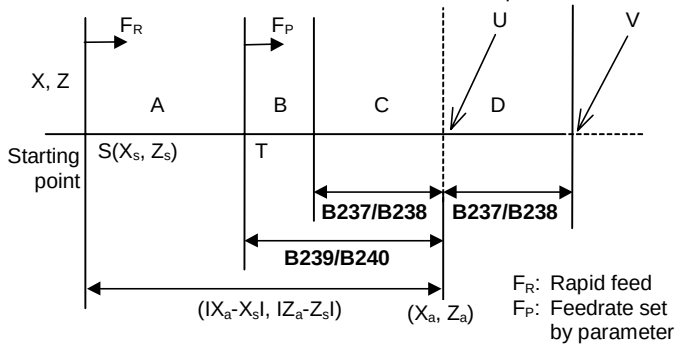
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B229</td><td colspan="2">Distance between the turrets for opposed-turret mirror image</td><td rowspan="4">Set the radial distance from the reference tool position of a reference turret to that of the opposed turret.<br>This parameter becomes invalid if the distance to the opposed turret is designated in the program. Refer to “Opposed-turret mirror image” of the EIA/ISO Programming Manual for further details.<br>  <br><br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">B230<br>B231<br>B232</td><td colspan="2">Dimensions of the virtual Y-axis, real X-axis and real Y-axis for inclined Y-axis offsetting</td><td rowspan="4">Set the lengths of the sides of a triangle formed according to the particular angle of inclination.<br>  <br><br>B230: Inclined Y-axis offsetting, virtual Y-axis<br>B231: Inclined Y-axis offsetting, Real X-axis<br>B232: Inclined Y-axis offsetting, Real Y-axis</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Power<br>OFF → ON</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

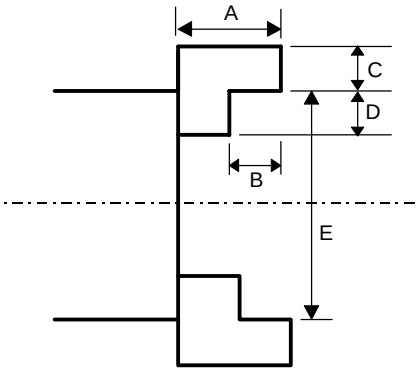
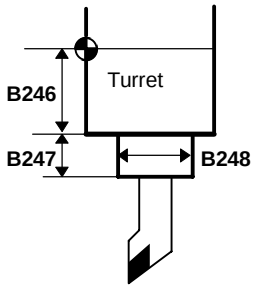
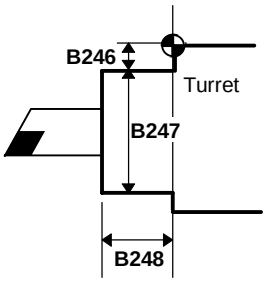
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B233</td><td colspan="2">Pre-interpolation acceleration/deceleration: Target speed</td><td rowspan="4">Set the target speed for pre-interpolation acceleration/deceleration.<br>  <br></td></tr>
<tr><td>Unit</td><td>mm/min or<br>0.1 inches/min</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B234</td><td colspan="2">Distance from reference workpiece zero point to center of milling spindle rotation (absolute value)</td><td>B234 = Milling spindle edge rotation radius + Tool setting value of milling spindle edge (absolute value)<br>  <br><br>B234: Set the distance from center of milling spindle rotation to reference workpiece zero point (absolute value)<br>(Milling spindle edge rotation radius + absolute value of tool setting value of milling spindle edge)<br>A8: Position of reference workpiece zeropoint viewed from the machine zero point (set in machine coordinate)<br>B64: Position of tool eye viewed from the machine zero point (set in machine coordinate)<br>Tool setting value Z:<br>TS (Z) = Measurement position + A8 – B64<br>Position of reference workpiece zero point viewed from tool eye:<br>A8 – B64 (offset of tool setting value)</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B235</td><td colspan="2">Correction value relating to the workpiece measuring sensor diameter for protrusion width measurement</td><td>This value is used for measured value calculation.<br>Az = |#1 – #2| – 2R + B235<br>Az: Measured value<br>#1/#2: Sensor ON positions<br>R: Radius of curvature of the touch sensor nose<br>When WID-OUT and WID-IN are measured, if this parameter is not set (or set to 0), the value of the B66 parameter will be used.<br>*: The setting unit when the EIA decimal digit adding function is valid.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

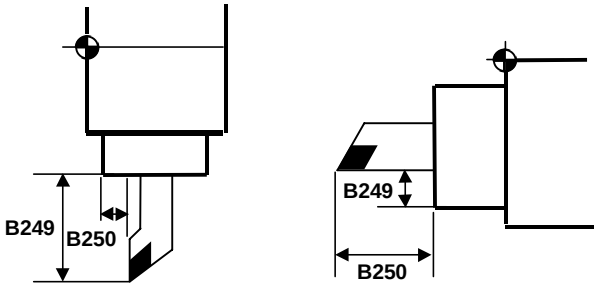
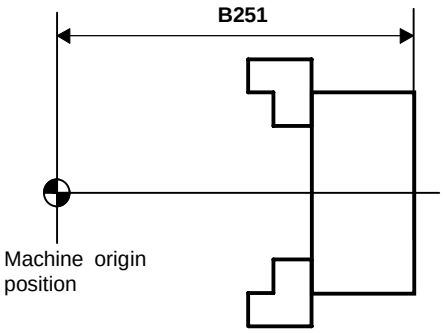
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B236</td><td colspan="2">Correction value relating to the workpiece measuring sensor diameter for groove width measurement</td><td rowspan="4">This value is used for measured value calculation.<br>Az = |#1 – #2| + 2R + B236<br>Az: Measured value<br>#1/#2: Sensor ON positions<br>R: Radius of curvature of the touch sensor nose<br>When GRV-OUT and GRV-IN are measured, if this parameter is not set (or set to 0), the value of the B67 parameter will be used.<br>*: The setting unit when the EIA decimal digit adding function is valid.</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B237<br>to<br>B240</td><td colspan="2">Measurement area for automatic tool offsetting</td><td rowspan="4">Premeasurement point<br> 
<br>B237: Measurement area setting for automatic tool offsetting, X-axial direction<br>B238: Measurement area setting for automatic tool offsetting, Z-axial direction<br>B239: Deceleration area setting for automatic tool offsetting, X-axial direction<br>B240: Deceleration area setting for automatic tool offsetting, Z-axial direction<br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
</table>

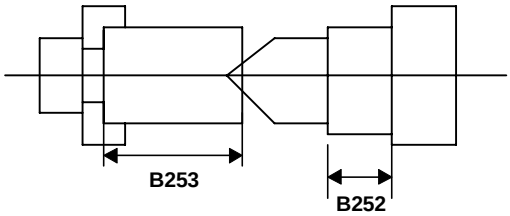
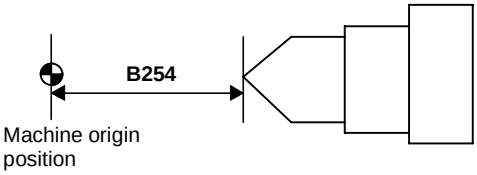
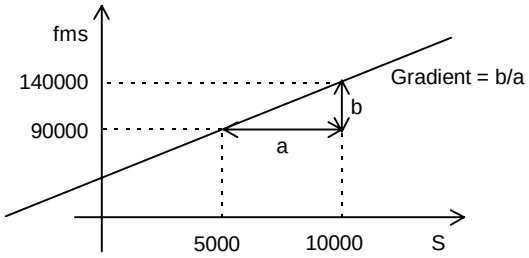
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B241** to **B245** | EIA chuck barrier<br>Jaw shape dimensions | | Set the jaw shape data for forming chuck barriers using an EIA/ISO program.<br>  <br>**B241:** EIA chuck barrier, Jaw shape dimension A<br>**B242:** EIA chuck barrier, Jaw shape dimension B<br>**B243:** EIA chuck barrier, Jaw shape dimension C<br>**B244:** EIA chuck barrier, Jaw shape dimension D<br>**B245:** EIA chuck barrier, Jaw shape dimension E<br><br>*: The setting unit when the EIA decimal digit adding function is valid |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **B246** to **B248** | EIA tool barrier<br>Holder dimensions | | Set the holder shape data for forming tool barriers using an EIA/ISO program.<br><Holder-under type><br>Input **B246** with a minus sign.<br>  <br><Holder-side type><br>Input **B246** with a plus sign.<br>  <br>**B246:** EIA tool barrier, Holder mounting position<br>**B247:** EIA tool barrier, X-axial width of the holder<br>**B248:** EIA tool barrier, Z-axial width of the holder |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | |
| | Effective condition | Instant | |
| | Applicable program | E | *: The setting unit when the EIA decimal digit adding function is valid |

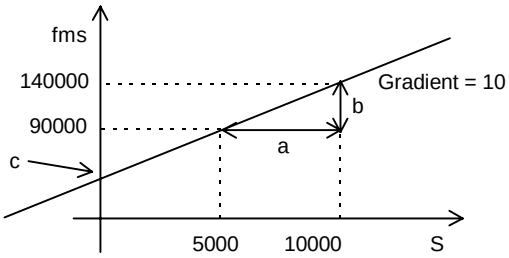
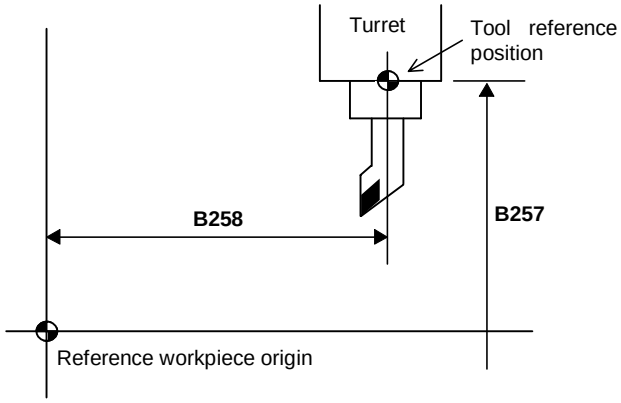
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B249**<br>**B250** | EIA tool barrier<br>Tool nose position | | Set the tool nose position data for forming tool barriers using an EIA/ISO program. The EIA tool barriers become valid at the nose position of the tool. They do not become valid for the tool shape.<br><Holder-under type><br>Input **B249** with a minus sign.<br><Holder-side type><br>Input **B250** with a minus sign.<br>  <br>**B249:** EIA tool barrier, Z-axial nose position of the tool<br>**B250:** EIA tool barrier, X-axial nose position of the tool |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | *: The setting unit when the EIA decimal digit adding function is valid |
| | Effective condition | Instant | |
| | Applicable program | E | |
| **B251** | EIA chuck barrier<br>Sub-chuck mounting position | |  |
| | Unit | 0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.) | *: The setting unit when the EIA decimal digit adding function is valid |
| | Effective condition | Instant | |
| | Applicable program | E | |

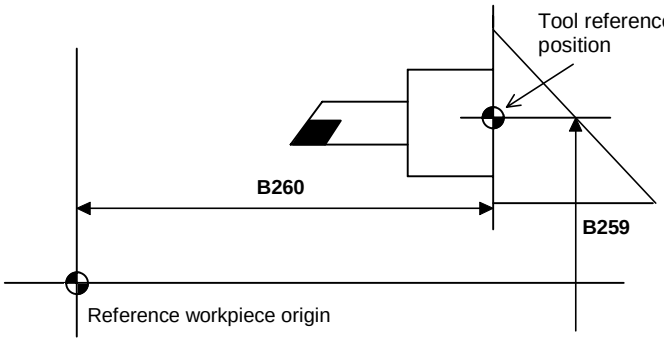
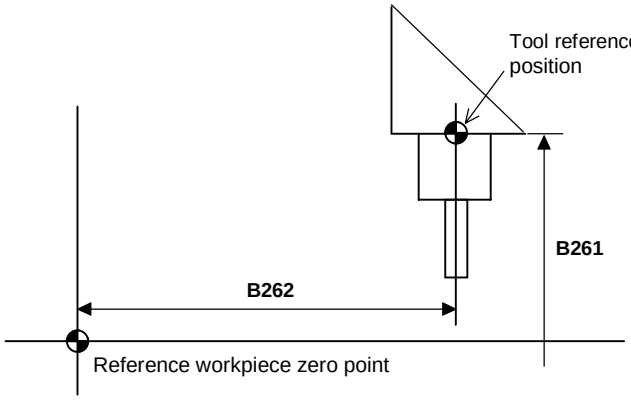
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B252<br>to<br>B254</td><td colspan="2">EIA tail barrier<br>Tail dimensions</td><td rowspan="4">Set the dimensional data for forming tail barriers using an EIA/ISO program.<br><During tail operation><br>  <br><br><During tail reversing><br>  <br><br>B252: EIA tail barrier, Tail extruding length<br>B253: EIA tail barrier, Workpiece length<br>B254: EIA tail barrier, Distance from the machine origin position to the leading edge position during tail reversing<br>*: The setting unit when the EIA decimal digit adding function is valid</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 in.<br>(* 0.0001 mm or 0.00001 in.)</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>E</td></tr>
<tr><td rowspan="4">B255</td><td colspan="2">Spindle viscous friction coefficient “cms” for auto-pecking of the cutting load detection type</td><td rowspan="4">If the “fms” value depends on revolutions, specify the gradient.<br>Example:<br>If “fms” is 90000 for a “S” value of 5000<br>If “fms” is 140000 for a “S” value of 1000<br>  <br><br>Since<br>“cms” = (140000 – 9000) / (10000 –5000) = 10,<br>set “10” in B255 in the above example.</td></tr>
<tr><td>Unit</td><td>–</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
</table>

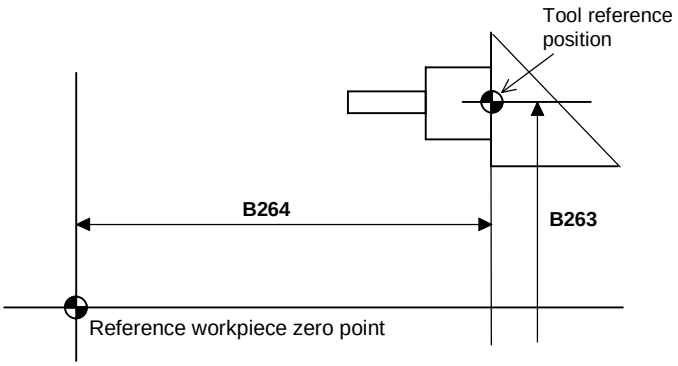
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B256</td><td colspan="2">Spindle coulombic friction coefficient “fms” for auto-pecking of the cutting load detection type</td><td rowspan="4">Set the value where the width of the flat section in the current feedback data matches estimated data.<br><br>Example:<br>If “fms” is 90000 for a “S” value of 5000 or if “fms” is 140000 for “S” value of 10000, set “C” in B256<br> 
<br><br>Calculate “c” from the linear equation<br>“y = (b/a)x + c”. Since<br>“c” = 90000 – (10 × 5000) = 40000,<br>set “40000” in B256 in the above example.</td></tr>
<tr><td>Unit</td><td>–</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M</td></tr>
<tr><td rowspan="4">B257<br>B258</td><td colspan="2">Tool reference position (For INTEGREX machines, this parameter related to ↓ turning tool)</td><td rowspan="4">Set the dimensions shown in the diagram below.<br> 
<br><br>B257: X-axial tool reference position<br>(For INTEGREX machines, ↓ turning tool)<br>B258: Z-axial tool reference position<br>(For INTEGREX machines, ↓ turning tool)</td></tr>
<tr><td>Unit</td><td>0.001 mm or 0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

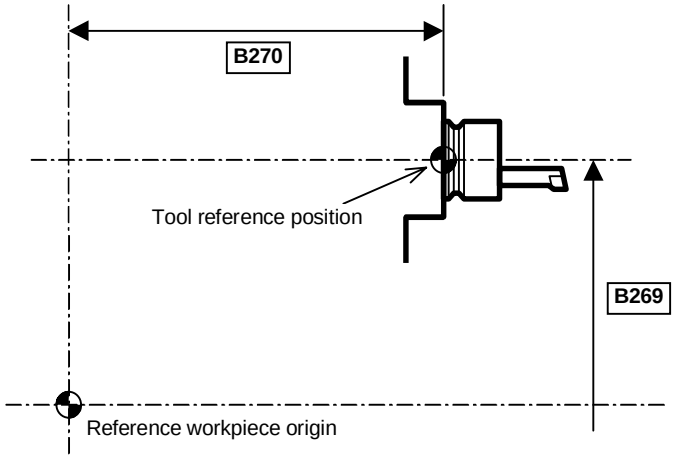
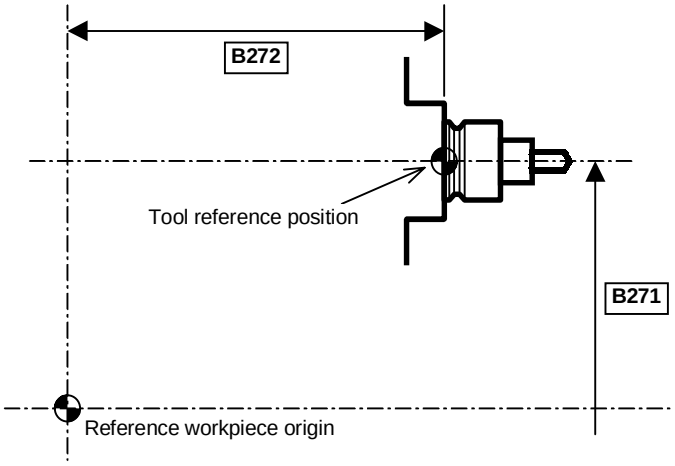
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B259<br>B260</td><td colspan="2">Tool reference position (For ← turning)<br>Only for INTEGREX machines</td><td>Set the dimensions shown in the diagram below.<br>  <br><br>B259: X-axial tool reference position (← turning tool)<br>B260: Z-axial tool reference position (← turning tool)<br><br>No setting for No. 2 spindle head.</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td><td rowspan="3"></td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B261<br>B262</td><td colspan="2">Tool reference position (For ↓ milling)<br>Only for INTEGREX machines</td><td>Set the dimensions shown in the diagram below.<br>  <br><br>B261: X-axial tool reference position (↓ milling tool)<br>B262: Z-axial tool reference position (↓ milling tool)<br><br>No setting for No. 2 spindle head.</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td><td rowspan="3"></td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **B263**<br>**B264** | Tool reference position (For ← milling)<br>Only for INTEGREX machines | | Set the dimensions shown in the diagram below.<br>  <br><br>**B263:** X-axial tool reference position (← milling tool)<br>**B264:** Z-axial tool reference position (← milling tool)<br>No setting for No. 2 spindle head. |
| | Unit | 0.001 mm or 0.0001 inches | |
| | Effective condition | Instant | |
| | Applicable program | M, E | |
| **B265**<br>**B266** | Number of jaws to be used for displaying solids | | Set the number of jaws of the main spindle or sub-supindle to be used to display solids.<br>**B265**: Jaws of the No. 1 spindle<br>**B266**: Jaws of the No. 2 spindle |
| | Unit | – | |
| | Effective condition | Instant | |
| | Applicable program | M | |
| **B267**<br>**B268** | Jaws offsets for displaying solids | | Set the jaw offsets for displaying solids.<br>**B267**: Jaws of the No. 1 spindle<br>**B268**: Jaws of the No. 2 spindle |
| | Unit | 0.1 deg | |
| | Effective condition | Instant | |
| | Applicable program | M | |

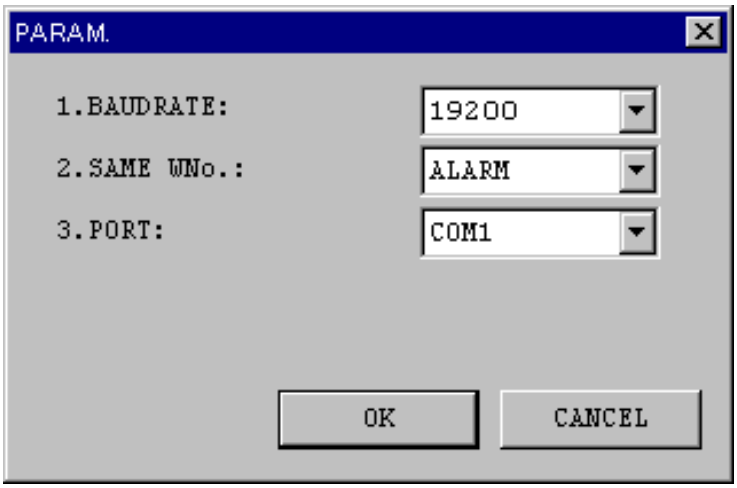
| Title of display | PARAMETER (MACHINE, MACHINE) |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">B269<br>B270</td><td colspan="2">Tool reference position<br>(For → turning tool)<br>Only for INTEGREX machines</td><td rowspan="4">Set the dimensions shown in the diagram below.<br>  <br><br>B269: X-axial tool reference position (For → turning tool)<br>B270: Z-axial tool reference position (For → turning tool)</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">B271<br>B272</td><td colspan="2">Tool reference position<br>(For → milling tool)<br>Only for INTEGREX machines</td><td rowspan="4">Set the dimensions shown in the diagram below.<br>  <br><br>B271: X-axial tool reference position (For → milling tool)<br>B272: Z-axial tool reference position (For → milling tool)</td></tr>
<tr><td>Unit</td><td>0.001 mm or<br>0.0001 inches</td></tr>
<tr><td>Effective condition</td><td>Instant</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

## 3-9 DATA I/O CMT PARAM.

### CMT parameter

Parameter setting

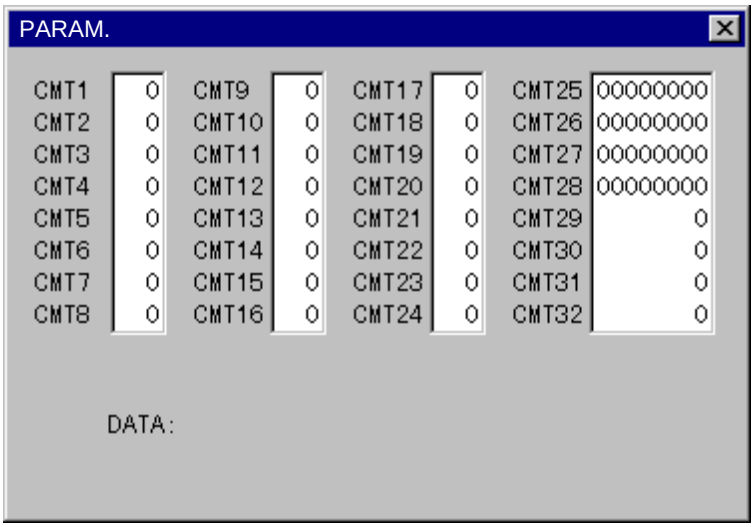



D735S0004E

| Classification | DATA I/O | Title of display | CMT PARAM. |
|---|---|---|---|

| Meaning | | Description |
|---|---|---|
| Baudrate | | Baudrate for RS-232C interface<br>Setting<br>110 / 4800 / 300 / 9600 / 1200 / 19200 / 2400 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Acceptance of same work number | | Set condition for machining program load of same work number<br>Setting<br>Upon acceptance of same work number, alarm will be caused<br>Upon acceptance of same work number, it will be altered. |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Selection of port | | Select CMT port<br>Setting<br>COM1 CF22 serial channel 3<br>COM2 CF22 serial channel 4<br>COM3 CF21 serial channel 1 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

Detailed parameter setting




D735S0005E

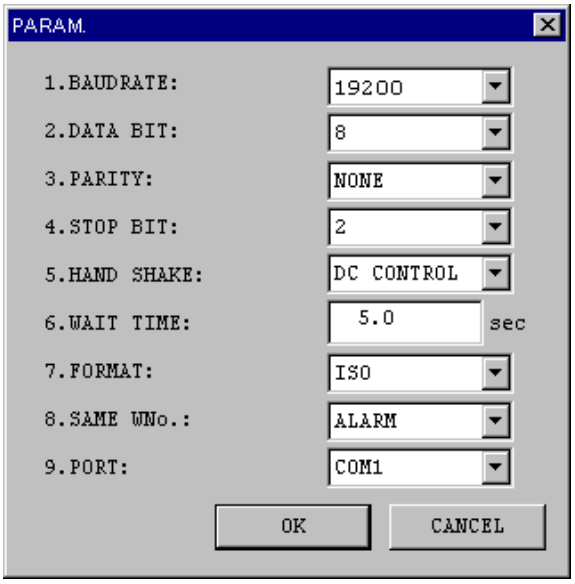
| Classification | DATA I/O | Title of display | CMT PARAM. |
|---|---|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **CMT25** | Selection between whether or not to load for CMT and DNC 1/O operation tool data or tool offset data | | 7 6 5 4 3 2 1 0<br>Selection of loading tool data or tool offset data<br>0: Alarm<br>1: Always loaded<br>Selection of saving program with set up data<br>0: Saved<br>1: Not saved<br>Selection of loading tool data number and suffix<br>0: Loaded<br>1: Not loaded<br>Selection of loading pitch error compensation of machine parameter<br>0: Loaded<br>1: Not loaded<br>Selection of loading jow data<br>0: Alarm<br>1: Always loaded |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

## 3-10 DATA I/O PARAM.

### Tape Parameter (TAP)

Parameter setting




D735S0006E

| Classification | DATA I/O | Title of dispaly | TAPE PARAM. |
|---|---|---|---|

| Meaning | | Description |
|---|---|---|
| Baudrate | | Display baudrate for RS-232C interface<br>Setting<br>110 / 4800 / 300 / 9600 / 1200 / 19200 / 2400 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Data bit digits | | Display data bit digits of initial setting parameter for RS-232C interface<br>Setting<br>5 / 6 / 7 / 8 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

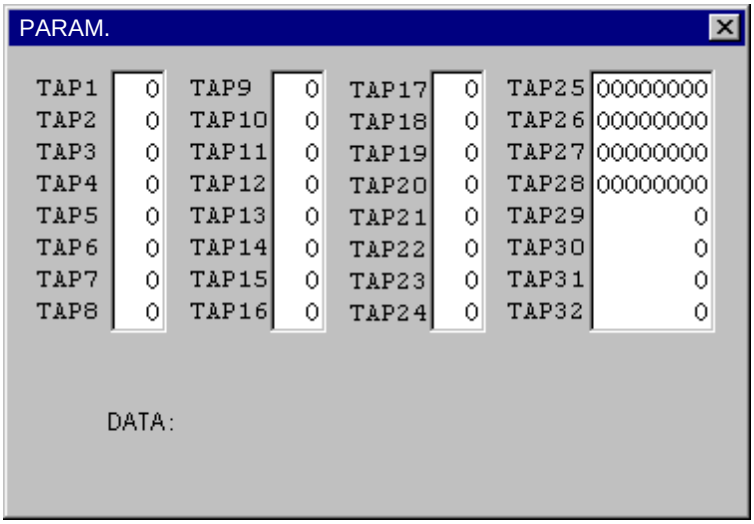
| Classification | DATA I/O | Title of dispaly | TAPE PARAM. |
|---|---|---|---|

| Meaning | | Description |
|---|---|---|
| Parity bit | | Display parity check of initial setting parameter for RS-232C interface<br>Setting: NONE / ODD / EVEN |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Stop bit digits | | Display stop bit digits of initial setting parameter for RS-232C interface<br>Setting: 1 / 1.5 / 2 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Selection of handshaking method | | Parameter for selecting handshaking method to control data transfer between NC equipment and I/O units<br>Setting: RTS/CTS — RTS/CTS for unit connection<br>Setting: – — No control (free transfer)<br>Setting: DC CONTROL — Control codes DC 1 to 4 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Wait time | | Waiting time (sec) for response from I/O units set.<br>When the set time has passed after the last response, alarm will be caused. |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

| Classification | DATA I/O | Title of dispaly | TAPE PARAM. |
|---|---|---|---|

| Meaning | | Description |
|---|---|---|
| Output format | | Change the output selection of punching on paper tape.<br>Setting<br>ISO: Punch on paper tape by ISO code<br>EIA: Punch on paper tape by EIA code<br>ASCII: Punch on paper tape by ASCII code |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Acceptance of same work number | | Set the condition on machining program load of same work number.<br>Setting<br>Upon acceptance of same work number, alarm will be caused<br>Upon acceptance of same work number, it will be altered. |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Selection of port | | Select tape port<br>Setting<br>COM1: CF22 serial channel 3<br>COM2: CF22 serial channel 4<br>COM3: —<br>COM4: — |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

Detailed parameter setting




D735S0007E

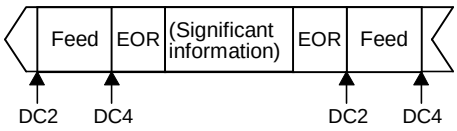
| Classification | DATA I/O |
|---|---|

| Title of display | TAPE PARAM. |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **TAP1** | Terminator type | | See table below |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP2** | Terminator code 1 | | This parameter can be used only when the terminator type (**I10**) is set to 4 or 5 only. The terminator type, however, must be set to 1 to allow paper tape processing. 0 must be used for this parameter in such cases. |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Setting | Terminator |
|---|---|
| 0 | No terminator |
| 1 | EOB or EOR |
| 2 | EOB only |
| 3 | EOR only |
| 4 | Any one character (character specified by **TAP2**) |
| 5 | Two characters of your choice (First Character specified by **TAP2**, second character fixed to 0) |

| Classification | DATA I/O | Title of display | TAPE PARAM. |
|---|---|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">TAP4</td><td colspan="2">CR code output to paper tape punch</td><td rowspan="4">Selection between whether or not CR code should be added before LF (the end of block)<br>0: CR code not added<br>1: CR code added</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">TAP5</td><td colspan="2">Selection of DC code parity</td><td rowspan="4">Parameter for selection between whether or not parity should be added for DC code output<br><table><tr><th>Setting</th><th></th><th colspan="10">Hole position patterns of DC 3 code</th></tr><tr><td>0</td><td>NO</td><td></td><td></td><td></td><td>●</td><td>•</td><td></td><td></td><td></td><td>●</td><td>●</td></tr><tr><td>1</td><td>YES</td><td>●</td><td></td><td></td><td>●</td><td>•</td><td></td><td></td><td></td><td>●</td><td>●</td></tr></table><br>Note:<br>This parameter is used only when handshaking method is set to “DEC control”.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">TAP6</td><td colspan="2">DC code output on feed control</td><td rowspan="4">Select between whether or not DC 2 and DC4 code outputs should be made to feed section where paper tape punch (PTP) start and end are commanded<br>Example:<br> 

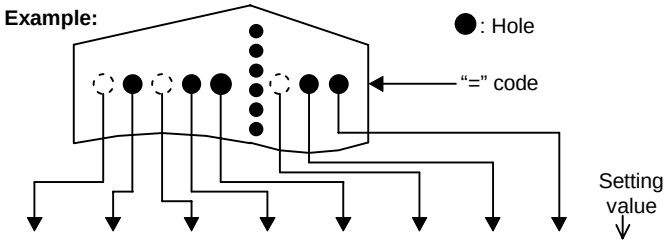
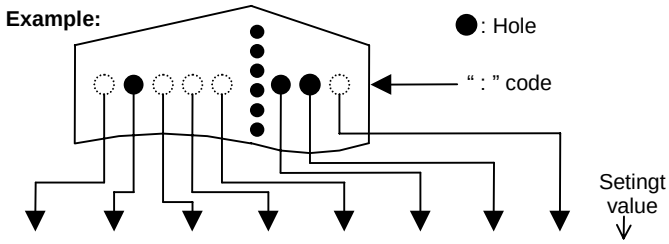
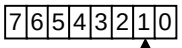
<table><tr><th>Setting</th><th>Description</th></tr><tr><td>0</td><td>No output of DC2 or DC4</td></tr><tr><td>1</td><td>Output of DC2 only</td></tr><tr><td>2</td><td>Output of DC4 only</td></tr><tr><td>3</td><td>Output of both DC2 and DC4</td></tr></table><br>Note:<br>This parameter is valid only when handshaking method is set to “DC control”.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Classification | DATA I/O | Title of display | TAPE PARAM. |
|---|---|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **TAP9** | Perforation pattern for "[" code on paper tape reader/puncher for EIA | | Specifying perforation pattern for loading or punching "[" by EIA code on paper tape reader/punch.<br>Count hole position by 8 units of binary digits, and convert the binary number into a decimal number.<br>**Example:** ●: Hole, "[" code, Setting value<br>$(0\times2^7)+(1\times2^6)+(0\times2^5)+(0\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(0\times2^0)$ = 76<br>MPL068 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP10** | Perforation pattern for "]" code on paper tape reader/puncher for EIA | | Specifying perforation pattern for loading or punching "]" by EIA code on paper tape reader/punch.<br>Count hole positions by 8 units of binary digits (1/10), and convert the binary number into a decimal bunber.<br>**Example:** ●: Hole, "]" code, Setting value<br>$(0\times2^7)+(0\times2^6)+(0\times2^5)+(0\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(1\times2^0)$=13<br>MPL069 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP11** | Perforation pattern for "#" code on paper tape reader/puncher for EIA | | Specifying perforation pattern for loading or punching "#" by EIA code on paper tape reader/punch<br>Count hole positions by 8 units of binary digits, and convert the binary number into a decimal number.<br>**Example:** ●: Hole, "#" code, Setting value<br>$(0\times2^7)+(1\times2^6)+(1\times2^5)+(0\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(1\times2^0)$=109<br>MPL070 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP12** | Perforation pattern for "*" code on paper reader/puncher for EIA | | Specifying perforation pattern for loading or punching "*" by EIA code on paper tape reader/punch<br>Count hole positions by 8 units of binary digits (1/0), and convert the binary number into a decimal number.<br>**Example:** ●: Hole, "*" code, Setting value<br>$(0\times2^7)+(1\times2^6)+(1\times2^5)+(1\times2^4)+(1\times2^3)+(0\times2^2)+(1\times2^1)+(0\times2^0)$=122<br>MPL071 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

| Title of display | TAPE PARAM. |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **TAP13** | Perforation pattern for "=" code on paper reader/puncher for EIA | | Specifying perforation pattern for loading or punching "=" by EIA code on paper tape reader/punch<br>Count hole positions by 8 units of binary digits (1/0), and convert the binary number into a decimal number.<br>**Example:**<br>  <br><br>$(0\times2^7)+(1\times2^6)+(0\times2^5)+(1\times2^4)+(1\times2^3)+(0\times2^2)+(1\times2^1)+(1\times2^0)=\underline{91}$<br>MPL072 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP14** | Perforation pattern for ":" code on paper tape reader/puncher for EIA | | Specifying perforation pattern for loading or punching ":" by EIA code on paper tape reader/punch<br>Count hole positions by 8 units of binary digits (1/0), and convert the binary number into a decimal number.<br>**Example:**<br>  <br><br>$(0\times2^7)+(1\times2^6)+(0\times2^5)+(0\times2^4)+(0\times2^3)+(1\times2^2)+(1\times2^1)+(0\times2^0)=\underline{70}$<br>MPL073 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP25** | Selection of parity V check | |  <br><br>Specifies whether a parity V check is to be conducted during paper tape reading.<br>0: No<br>1: Yes |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O | Title of display | TAPE PARAM. |
|---|---|---|---|

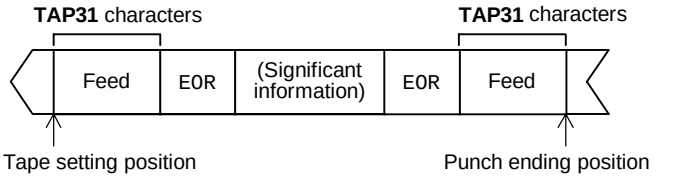
<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">TAP26</td><td colspan="2">Selection of program name tape input/output<br>Selection of setup information punching<br>Selection of RTS/CTS control when “DC control” is selected</td><td rowspan="4">7 6 5 4 3 2 1 0<br>Specifies whether the program name input/output function is to be made valid during tape reading or punching.<br>0: Invalid<br>1: Valid<br>Specifies whether to punch the setup information in the TAPE mode.<br>0: Valid<br>1: Invalid<br>Specifies whether RTS/CTS control is to be conducted when “DC control” is selected in the TAPE hand-shaking scheme.<br>0: Yes (Conducting both DC control and RTS/CTS control)<br>1: No (Conducting only DC control)<br>Note:<br>For connection to a microdisk unit, set up “0” at bit 7.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">TAP27</td><td colspan="2">Selection of PTP program end code</td><td rowspan="4">7 6 5 4 3 2 1 0 (0: YES 1: NO )<br>Selection between whether or not O or : code of next program should be used as program end for loading a number of programs<br>M199<br>M198<br>M99<br>M30<br>M02<br>When these codes are loaded, select whether or not use them as PTP program<br>Character conversion input/output using an extension tape<br>0 : In the case where the character data* is in ASCII codes. The character data will be input/output as it is<br>1 : In the case where the character data* is not in ASCII codes (special code, etc.). The character data will be converted into character codes prior to input/output.<br>* Denotes workpiece materials, tool materials, tool names and jaw names.</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
</table>

| Classification | DATA I/O | Title of display | TAPE PARAM. |
|---|---|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **TAP28** | Protocol B function selection | | 7 6 5 4 3 2 1 0<br>Start code<br>0: DC1<br>1: BEL<br>DC3 output on completion<br>0: No output<br>1: Output<br>DC1 output after NAK or SYN<br>0: No output<br>1: Output<br>NC alarm (NAK) output<br>0: No output<br>1: Output<br>NC reset (SYN) output<br>0: No output<br>1: Output<br>Data code<br>0: ASCII<br>1: ISO<br>(normal setting: 00111010) |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | E | |
| **TAP29** | Number of space characters (SP) between work No. and program on paper tape puncher | | Specifying number of space characters (SP) between O number and program head in punching the program on paper tape<br>0 1 2 3 4 SP SP SP ~ SP CR Program<br>**TAP29**<br>(Number of characters)<br>MPL079 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **TAP30** | Number of space characters (SP) between programs on paper tape puncher | | Specifying number of space characters (SP) between different programs in punching programs on paper tape<br>~ M 0 2 CR SP SP ~ SP CR 0 1 2 3 4 ~<br>Program ← **TAP30** (Number of characters) → Program |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

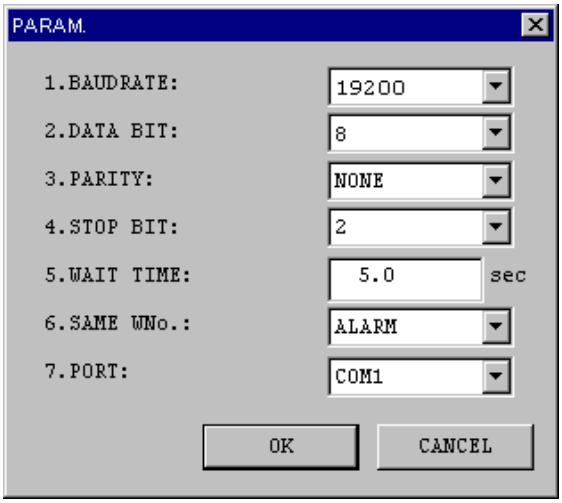
| Title of display | TAPE PARAM. |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **TAP31** | Number of leading and tailing feed characters of paper tape puncher | | Specifying number of NULL (feed) characters punched on leading and tailing portions of paper tape.<br>  <br><br>MPL078 |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

## 3-11 DATA I/O DNC PARAM.

### DNC Parameter (DNC)

Parameter setting




D735S0008E

| Classification | DATA I/O | Title of display | DNC PARAM. |
|---|---|---|---|

| Meaning | | Description |
|---|---|---|
| Baudrate | | Baudrate for RS-232C interface<br>Setting<br>110 / 4800 / 300 / 9600 / 1200 / 19200 / 2400 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Data bit digits | | Display data bit digits of initial setting parameter for RS-232C interface<br>Setting<br>5 / 6 / 7 / 8 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

| Classification | DATA I/O | Title of display | DNC PARAM. |
|---|---|---|---|

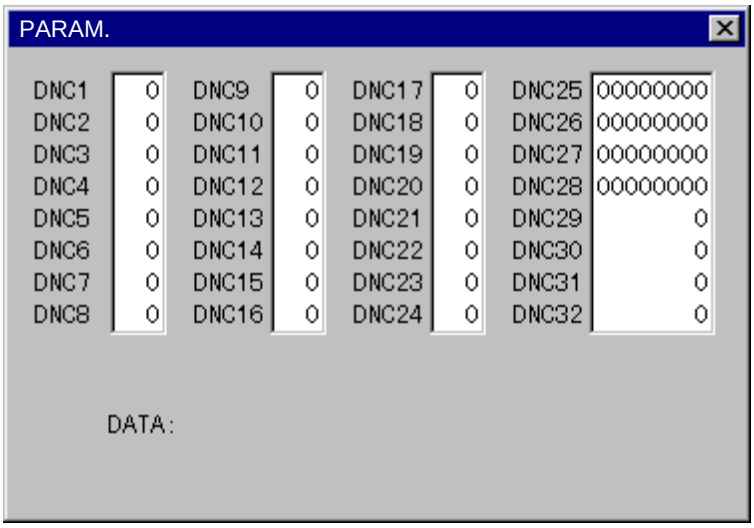
| Meaning | | Description |
|---|---|---|
| Parity bit | | Display parity check of initial setting parameter for RS-232C interface<br>Setting<br>NONE<br>ODD<br>EVEN |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Stop bit digits | | Display stop bit digits of initial setting parameter for RS-232C interface<br>Setting<br>1<br>1.5<br>2 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Wait time | | Waiting time (sec) for response from I/O units set.<br>When the set time has passed after the last response, alarm will be caused. |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |
| Acceptance of same work number | | Set the condition on machining program load of same work number.<br>Setting<br>Upon acceptance of same work number, alarm will be caused<br>Upon acceptance of same work number, it will be altered. |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

| Title of display | DNC PARAM. |
|---|---|

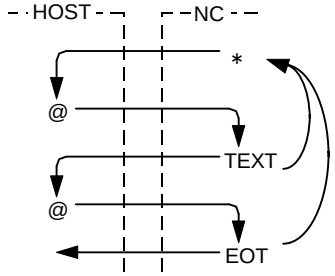
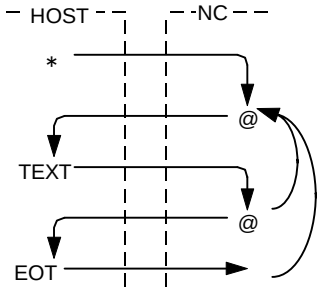
| Meaning | | Description |
|---|---|---|
| Selection of port | | Select DNC port<br><br>Setting<br><br>COM1 — CF22 serial channel 3<br>COM2 — CF22 serial channel 4<br>COM3 — CF21 serial channel 1 |
| Unit | — | |
| Effective condition | I/O start | |
| Applicable program | M, E | |

Detailed parameter setting

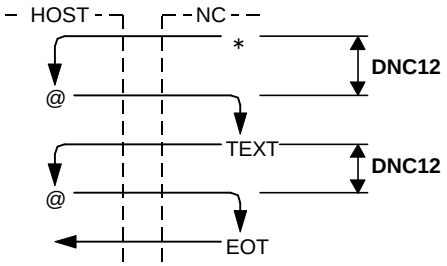
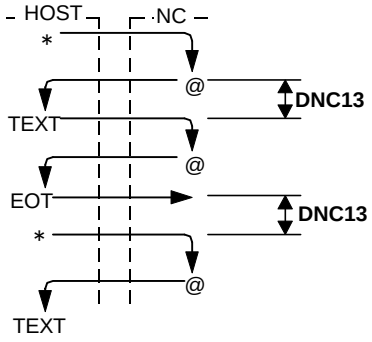



D735S0009E

| Classification | DATA I/O | Title of display | DNC PARAM. |
|---|---|---|---|

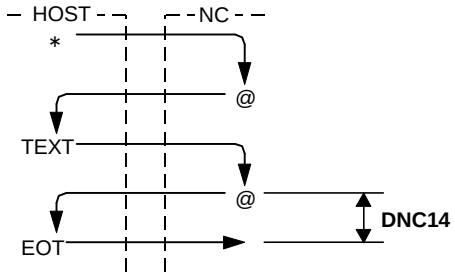
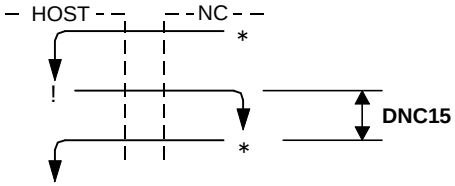
| Address | Meaning | | Description |
|---|---|---|---|
| **DNC9** | Transmission retry frequency for DNC file transfer | | Setting how often transmission to be repeated after * or TEXT has been transferred without @ signaled back from HOST within waiting time set for parameter “wait time duration”<br>  <br>MPL081<br>After repetition as often as the set number of times, alarm will be caused. |
| | Unit | Times | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC10** | Transmission retry frequency for DNC command message transfer | | Setting how often return to initial status to be repeated after @ has been transferred without TEXT or EOT signaled back from HOST within waiting time set for parameter “wait time duration”<br>  <br>MPL082<br>After repetition as often as the set number of times alarm will be caused. |
| | Unit | Times | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O | Title of display | DNC PARAM. |
|---|---|---|---|

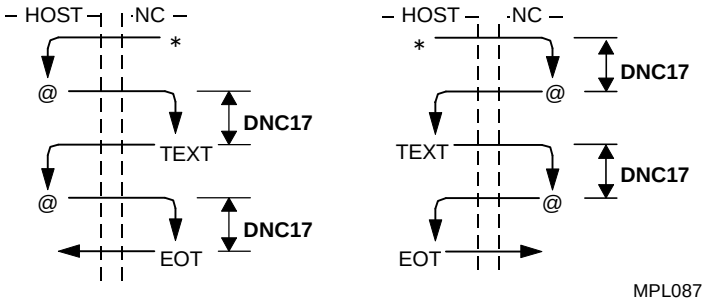
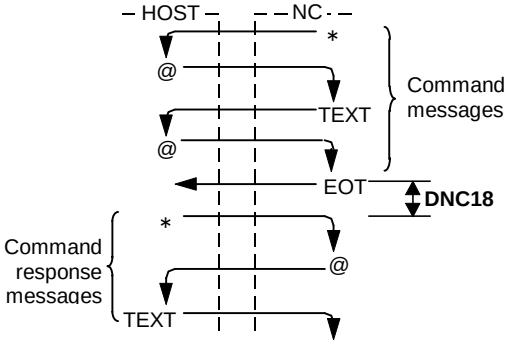
| Address | Meaning | | Description |
|---|---|---|---|
| **DNC11** | Transmission retry frequency for DNC command message transfer | | Setting how often to be repeated when command message has not been correctly transferred.<br>It is almost same as the case of parameters **DNC9** and **DNC10**, there is however, a difference in what are transfered, that is command message for **DNC11** while file for **DNC9** and **DNC10**. |
| | Unit | Times | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC12** | @ waiting time for DNC transfer | | Setting of waiting time until NC equipment receives @ signaled from HOST after transmission of ∗ or TEXT<br>  <br><br>MPL083<br>**Note:** Refer to parameter **DNC9**. |
| | Unit | 0.1 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC13** | TEXT, * waiting time for DNC transfer | | Setting waiting time until NC equipment receives TEXT or * signaled from HOST after transmission of @ or reception of EOT<br>  <br><br>MPL084<br>**Note:** Refer to parameter **DNC10**. |
| | Unit | 0.1 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

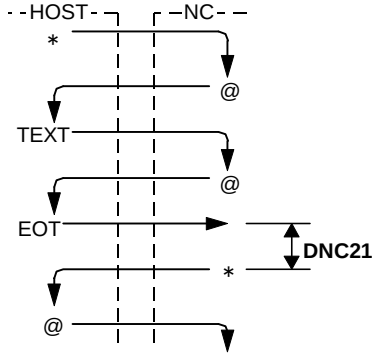
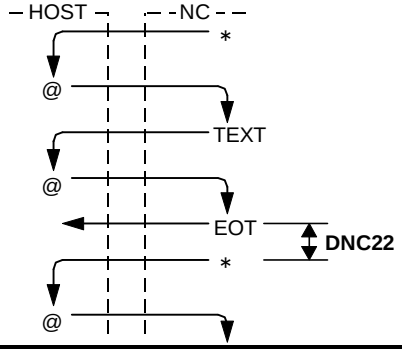
| Title of display | DNC PARAM. |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **DNC14** | EOT waiting time for DNC transfer | | Setting of waiting time until NC equipment receives EOT signaled from HOST after transmission of @<br>  <br><br>MPL085<br>**Note:** Refer to parameter **DNC10** |
| | Unit | 0.1 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC15** | Stop time after acceptance of ! for DNC transfer | | Setting of stop time until NC equipment transmits * after reception of ! from HOST<br>  <br><br>MPL086<br>∗ will be transfered of the end of duration **DNC15** after reception of “1” from HOST. |
| | Unit | 0.1 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC16** | Reset time after digital out for DNC transfer | | Setting of time until internal resetting of NC equipment after reception of digital out command |
| | Unit | 0.1 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O | Title of display | DNC PARAM. |
|---|---|---|---|

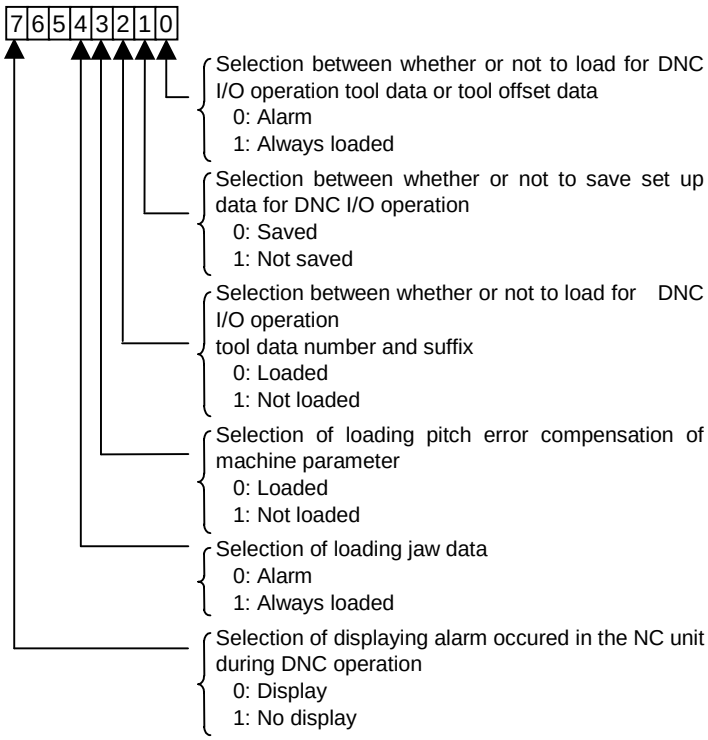
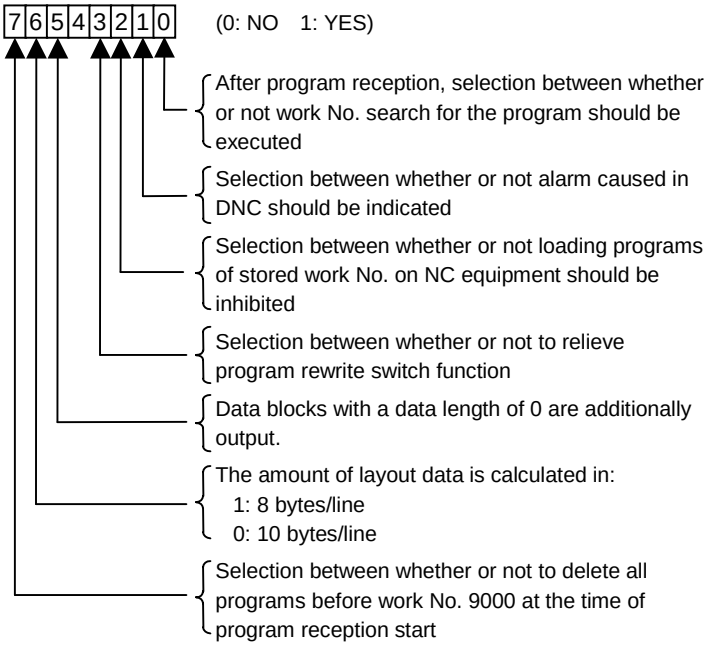
| Address | Meaning | | Description |
|---|---|---|---|
| **DNC17** | Acceptance → stop time for DNC transfer | | Setting of time data below<br><NC equipment signaling><br>NC equipment stop time after reception of @ from HOST until transmission of TEXT or EOT<br><NC equipment receiving><br>NC equipment stop time after reception of * or TEXT until transmission of @<br>  <br><br>MPL087 |
| | Unit | 0.01 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC18** | Command response message waiting time for DNC transfer | | Setting of waiting time until NC equipment receives * of command response message signaled from HOST after transmission of EOT of command message<br>  <br><br>MPL088 |
| | Unit | 0.1 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O | Title of display | DNC PARAM. |
|---|---|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **DNC19** | Machine No. for DNC transfer | | Each machine is given its own No. for DNC operation wherein, tool data and parameters are controlled on the HOST side by these data. |
| | Unit | | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC21** | Stop time between EOT acceptance and * transmission for DNC transfer (duration after acceptance upto signaling) | | Setting of stop time until NC equipment signals * of next message after reception of EOT from HOST   MPL089 |
| | Unit | 0.01 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC22** | Stop time between EOT transmission and * transmission for DNC transfer | | Setting of stop time until NC equipment signals * of next message after transmission of EOT   MPL090 |
| | Unit | 0.01 sec | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

| Title of display | DNC PARAM. |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **DNC25** | Selection between whether or not to load for DNC I/O operation tool data or tool offset data | |  |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |
| **DNC26** | Selection of functions for DNC I/O | |  |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

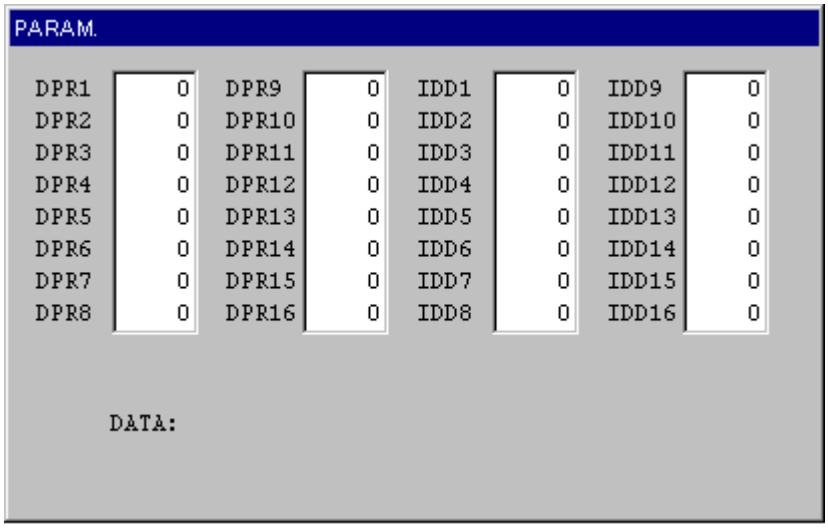
| Title of display | DNC PARAM. |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **DNC29** | DNC physical error detection repeat times | | Set the number of times that detection of physical errors during waiting for the first message (ENQ) from the host is to be repeated to identify whether the particular error is due to host power off/on actions or hardware errors.<br>After physical errors have occurred, if redetection within the setting of this parameter succeeds, those errors will be regarded as not being due to hardware errors and DNC communication will continue. A DNC alarm will result if redetection within the setting of the parameter does not succeed.<br>**DNC29** = 0<br>Default (5 times)<br>**DNC29** = 1 bis 255<br>Number of times of repetition after the occurrence of physical errors |
| | Unit | Times | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

## 3-12 DATA I/O EXTENDED PARAMETER

**Extended parameter**

Detailed parameter setting




D735S0051E

| Classification | DATA I/O | Title of display | EXTENDED PARAMETER |
|---|---|---|---|

| Address | Meaning | Description |
|---|---|---|
| **DPR1** | Baud rate<br>110 / 4800<br>300 / 9600<br>1200 / 19200<br>2400 | Baud rate for RS-232C interface |
| | Unit: — | |
| | Effective condition: I/O start | |
| | Applicable program: M, E | |
| **DPR2** | Stop bit<br>1<br>1.5<br>2 | Number of stop bits (parameter for RS-232C interface initialization) |
| | Unit: — | |
| | Effective condition: I/O start | |
| | Applicable program: M, E | |

| Setting | Baud rate | Set values | Baud rate |
|---|---|---|---|
| 0 | 110 | 4 | 4800 |
| 1 | 300 | 5 | 9600 |
| 2 | 1200 | 6 | 19200 |
| 3 | 2400 | | |

| Setting | Stop bit |
|---|---|
| 0 | 1 |
| 1 | 1.5 |
| 2 | 2 |

| Classification | DATA I/O |
|---|---|

| Title of display | EXTENDED PARAMETER |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **DPR3** | Parity bit | | Parity check (parameter for RS-232C interface initialization)<br><br>Setting / Paity bit<br>0 None<br>1 Odd<br>2 Even |
| | Unit | — | |
| | Effective condition | I/O Start | |
| | Applicable program | M, E | |
| **DPR4** | Data bit | | Number of data bits (parameter for RS-232C interface initialization)<br><br>Setting / Data bit<br>0 8<br>1 7 |
| | Unit | — | |
| | Effective condition | I/O Start | |
| | Applicable program | M, E | |
| **DPR5** to **DPR8** | — | | Not used |
| | Unit | — | |
| | Effective condition | — | |
| | Applicable program | — | |
| **DPR9** | Method of handshaking | | This parameter is used to select the method of handshaking to control the state of data transfer between the NC system and connected instrument.<br><br>Setting / Method / Description<br>0 None No control<br>1 DC control Complies with control code DC1 through DC4<br>2 RTS/CTS Complies with device connection RTS/CTS. |
| | Unit | — | |
| | Effective condition | I/O start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

| Title of display | EXTENDED PARAMETER |
|---|---|

| Address | Meaning | | Description |
|---|---|---|---|
| **DPR10** | DC code parity | | This parameter is used to specify whether or not a parity bit is to be assigned to the DC code to be output.<br><br>Setting / Parity / Hole-punching pattern of DC3 code<br>0 — No assignment — ● • ● •<br>1 — Assignment — ● ● • ● •<br><br>**Note:**<br>This parameter is valid only when the handshaking method is set to DC control (**DPR9** is set to 1). |
| | Unit | — | |
| | Effective condition | I/O Start | |
| | Applicable program | M, E | |
| **DPR11** | Feed section DC code output | | Select whether or not DC2 and DC4 codes are to be output to the feed sections.<br><br>**Example:**<br>Feed \| EOR \| (Significant information) \| EOR \| Feed<br>↑ DC2 ↑ DC4<br><br>Setting / Description<br>0 — Neither DC2 nor DC4 is output.<br>1 — Only DC2 is output.<br>2 — Only DC4 is output.<br>3 — Both DC2 and DC4 are output.<br><br>**Note:**<br>This parameter is valid only when the handshaking method is set to DC control (**DPR9** is set to 1). |
| | Unit | — | |
| | Effective condition | I/O Start | |
| | Applicable program | M, E | |
| **DPR12** | Waiting time | | The waiting time for replies from the connected instrument during inputting or outputting.<br>An alarm occurs if this time elapses following the final reply. |
| | Unit | — | |
| | Effective condition | I/O Start | |
| | Applicable program | M, E | |

| Classification | DATA I/O |
|---|---|

| Title of display | EXTENDED PARAMETER |
|---|---|

<table>
<tr><th>Address</th><th colspan="2">Meaning</th><th>Description</th></tr>
<tr><td rowspan="4">DPR13</td><td colspan="2">Output format</td><td rowspan="4">Selection of output code<br><table><tr><th>Setting</th><th>Format</th><th>Description</th></tr><tr><td>0</td><td>ISO</td><td>Output in ISO code</td></tr><tr><td>1</td><td>EIA</td><td>Output in EIA code</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O Start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">DPR14</td><td colspan="2">Port selection</td><td rowspan="4">Port selection<br><table><tr><th>Setting</th><th>Port</th><th>Description</th></tr><tr><td>0</td><td>COM1</td><td>CF22 serial ch3</td></tr><tr><td>1</td><td>COM2</td><td>CF22 serial ch4</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>I/O Start</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">DPR15</td><td colspan="2">Number of characters in feed section</td><td rowspan="4">Number of characters in NULL (feed)<br>Example:<br>DPR15 characters — DPR15 characters<br><table><tr><td>Feed</td><td>EOR</td><td>(Significant information)</td><td>EOR</td><td>Feed</td></tr></table></td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>1 character</td></tr>
<tr><td>Applicable program</td><td>M, E</td></tr>
<tr><td rowspan="4">DPR16</td><td colspan="2">—</td><td rowspan="4">Not used</td></tr>
<tr><td>Unit</td><td>—</td></tr>
<tr><td>Effective condition</td><td>—</td></tr>
<tr><td>Applicable program</td><td>—</td></tr>
</table>